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LUMIX GH6 reviewed:

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A matter of trust

Are we approaching a day when video can't be trusted? Imagine a country at war. A video goes viral showing its leader informing citizens to surrender and lay down their weapons. The problem, and the danger, is that this video is entirely not true. This was the case in Ukraine just weeks after the Russian invasion. A falsified video of President Selenskyy appeared on social media. Fortunately, the quality was poor enough that most people knew instantly that it wasn't real.

This form of digitally manipulated video is called a "deepfake," and the image quality keeps getting better and more believable. The term deepfake is a combination of a computer term "deep learning" and fake video. In the highest quality, an AI program learns a person's facial movements and then duplicates them with new words and expressions.

Some high-quality examples are found in the Star Wars saga films. It's well known that late actors Carrie Fisher and Peter Cushing were digitally added to scenes in the 2016 film "Rogue One: A Star Wars Story." Most recently, a young Luke Skywalker appears in the new "The Book of Boba Fett" series. Actor Mark Hammill, who is now 70 and very much alive, appears to be his 28-year-old self. The scenes were completely deepfaked. That includes his voice, which is often the most difficult to recreate. Of course, using this technology in film could simply be labeled "artistic license." Hammill was aware of the process and, presumably, gave his consent, so there is no harm done. Right?

Is this a problem?
So, when does technology cross the line? The truth is we are probably already there. Most Westerners are already highly skeptical of the media. In fact, a recent global survey done by the Edelman Trust indicates that the media is trusted less than the government and

businesses worldwide. In the US, only 39 percent of those surveyed said they trust the media. Many say that media is a dividing force in society, rather than a unifying one. Deepfakes are only a part of this issue. But they certainly add fuel to the fires of distrust.

There is an industry emerging that specializes in spotting these fake videos. Organizations like Sentinel. ai allow customers to upload videos and get real or fake ratings. Will this become a new requirement in the future?

Currently, the state of trust in video journalism is slumping. Perhaps the best way to combat the deepfake is for the video production industry to become passionate about the "deepreal" in the same way athletes have become passionate about standing against doping in certain sports. Producers, editors and videographers should become the best at spotting and reporting the manipulated videos. The best way to combat the falsehood is with the truth. May we become the champions of what is real and true. **V**

M. York

Matthew York is *Videomaker*'s Publisher/Editor.

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Panasonic LUMIX GH6

by Nicole LaJeunesse

Is it worth the upgrade?

Panasonic

www.panasonic.com

STRENGTHS
• 4K 4:2:2 10-bit video at 60 frames per second with unlimited internal recording
• New dynamic range boost mode
• 7.5 stops of 5-axis image stabilization

WEAKNESSES
• Contrast-based AF systems
• The size of the camera is too large
• Two different media card slots

SUMMARY
While we like the Panasonic LUMIX GH6, we'd recommend considering what you already have before purchasing.

RECOMMENDED USES
• Narrative Filmmaking
• Documentary Filmmaking and Journalism
• Corporate and Event Videography
• Marketing Video Production

$2,200

Does the GH6 live up to its legacy, or does it fall short? That's the question we aim to answer in this review of the Panasonic LUMIX GH6.

We'll start with an introduction to the camera and then move on to its pros and cons and the results of our performance tests. We'll also tell you about any issues we encountered during our testing period. And rounding out our analysis of the GH6, we'll look at the marketplace to see what other cameras you might consider alongside Panasonic's new offering. All of this will help us determine whether or not LUMIX GH6 lives up to its name — and whether it's worth buying.

Behind the lens

Like previous iterations in the popular LUMIX GH lineup, the Panasonic LUMIX GH6 is a Micro Four Thirds camera. At the heart of this camera is its 25.2 megapixel Live MOS Micro Four Thirds image sensor. With it, the camera can shoot at a top resolution of 5728 x 3024 at 29.97p at an amazing 1900 megabits per second. Plus, using the ProRes 422 HQ codec, the camera can record 4:2:2 10-bit footage — great for color work and special effects.

This latest model offers quite a few different frame rate options, starting with 5.7K at 60 frames per second.

Shooting at 60 fps will give you cinematic slow-motion footage when slowed to 30 fps or 24 fps for playback. You might push it and record at 120 fps, but it's unlikely you need to go above that unless you have a specific shot planned out. Fortunately, the GH6 shoots at frame rates up to 240 fps in 4K and up to 300 fps in full HD.

To keep shots steadier, the GH6 features Panasonic's Dual I.S. 2 image stabilization system, offering 7.5 stops of 5-axis stabilization. The system now also works while shooting anamorphic.

The camera also adds a new dynamic range boost mode along with some other useful new features. For instance, it has a new audio info button. Like the Q button, but for audio, this gives you quick access to audio control. The LUMIX GH6 also features a built-in fan for cooling and as well as a fully-articulating touchscreen.

Pros and cons

Now that we're a bit more familiar with this camera, let's talk about the pros and cons we discovered while shooting with the GH6.

Things we liked about the Panasonic LUMIX GH6

First thing first: 4K 4:2:2 10-bit video at 60 frames per second with unlim-

ited internal recording. That's awesome. This gives you lots of flexibility in post-production — high resolution, high bit depth and a frame rate that can provide either crisp action footage or satisfying cinematic slow motion. Plus, your only limitations in terms of clip length will be your battery and the size of your media.

On top of that, the GH6 has a new dynamic range boost mode that we found to be helpful. We'll talk more about those details in our performance tests.

Then lastly, as mentioned above, this camera offers 7.5 stops of 5-axis image stabilization. And that image stabilization works with anamorphic. This is a big help for those who use lens adapters and thus lose any optical image stabilization the lens might have offered.

Things we didn't like

Now let's talk about our cons. The first one up is the camera's contrast-only autofocus. With contrast-based AF systems, if you are in a situation where you don't have strong contrast, it's going to struggle. We'll talk more about this con when we discuss our autofocus test.

Our next gripe is the size of the camera. Despite being a Micro Four Thirds camera, the GH6 is really about the same size as a full-frame Panasonic LUMIX S-series camera, specifically the S5. The GH6 isn't necessarily a smaller camera these days, but we wish it was.

For our last issue, let's talk media. The GH6 has two media card slots, but they're not the same media. That's kind of a bummer. We'll talk more about that in the media section.

Performance tests

We conducted several image quality and performance tests to see how the GH6 handles the demands of video production. Here are the results.

Dynamic range

Let's start with dynamic range. For this test, we shot on our DSC Labs Xyla 21 dynamic range chart. This chart shows

us how many stops of dynamic range you can expect to capture with a given camera. We specifically wanted to know what kind of advantage the GH6's new dynamic range boost would give us in practical application.

When shooting with the boost on, we saw 12 to 13 stops a dynamic range — that's shooting in V-log along with the dynamic range boost. For comparison, we saw 11 stops dynamic range when shooting just in V-log with the dynamic boost turned off. Getting those two extra stops is going to be pretty fantastic in those situations where you want — or need — to have more dynamic light and shadow in the shot. Being able to capture more dynamic range helps you get the shot without overexposing your highlights or losing detail in the darker areas of your frame.

Low-light shooting

Now we'll move on to low-light performance. For our low-light test, we do an ISO ramp from ISO 100 all the way up to the camera's highest ISO. The purpose of this test is to find out how high you can take the ISO before noise is introduced into the image and before there is too much noise to get a professional result.

When testing the LUMIX GH6, we started off at ISO 100 and stepped through the ISO settings all the way to ISO 1600. In this range, the image was quite noiseless — no problem at all. The noise starts after 1600 ISO and gets worse up to 6400 ISO. We wouldn't shoot too much higher than that. At that point, the abundant noise will start to color shift, which is difficult to correct later.

Autofocus performance

As we mentioned earlier, the autofocus on the GH6 is contrast-only. That's disappointing as it will not be suited for all users. Here's what you need to consider: If you're relying on contrast in situations where you don't have strong contrast between your subject and its background, it's going to have a harder time there.

On the plus side, the GH6 does offer facial eye detection. It's great at detect-

HDMI port

ing faces when the subject is facing forward. However, we noticed that if the subject looks away from the camera, it loses track of the subject altogether. We also tested the camera's tracking ability by running toward the camera and popping in and out of frame. Unfortunately, the camera didn't keep up that well. In general, it works fine in a static shot, but if you are doing any kind of active shooting, you'll likely be disappointed. We found we got better results when taking manual control over the focus. The tap focus feature also worked in a pinch.

A note on rolling shutter

The GH6 has some rolling shutter effect, but t's not bad. It's definitely there — the camera uses a rolling shutter after all — but we wouldn't be concerned about it too much. It's typical for a camera like this.

The GH6 in your hand

Let's move on to the ergonomics and usability of the Panasonic LUMIX GH6. This section covers the creature-comfort features that can make a camera either a joy or a pain to operate.

The monitor

The GH6 features a fully articulating rear display with an angle tilt feature.

Panasonic LUMIX GH6

That means, when you flip out your screen, it can flip out and not interfere with your HDMI or your audio input cables. This makes it so you can use the fully articulating screen and not have to worry about knocking and bumping your cables.

The monitor is on the small side, but all monitors are quite small on mirrorless cameras. If that's an issue for you, we just recommend getting a bigger external monitor.

Button layout

Now moving on to the buttons, the GH6 has a dedicated record button on the front and the back, along with a tally light. This gives you a button to press no matter which side of the camera you're on. Also, you can reassign the record button and the shutter button to work as the camera's record button.

As we mentioned earlier, the GH6 features a new audio button that allows you to quickly see all your meters, adjust your input and change all of the audio settings. This is a lot more convenient than having to go in the menu, find the audio section and make the change there.

Menu navigation

As usual for the LUMIX lineup, the menu on the GH6 is not hard to deal with. In particular, we found setting up the autofocus to be quite simple. Indeed, it was easy to locate all of the options we need to access during shooting. There's no need to deep dive into menus; it's really intuitive. In fact, it's one of the best menus in the industry.

Battery life and overheating

Now moving on to battery life, we got about 80 minutes of battery life shooting continuously. However, if you want to record for longer than an hour and 20 minutes, you can run the camera off USB power.

Fortunately, we didn't experience any overheating at all when we were shooting with the camera — not in any of the high frame rates nor the high data rates, nothing. The GH6 could handle all of that. That's likely due to the camera's new fan and

TECH SPECS	
Lens Mount: Micro Four Thirds	**Media/Memory Card Slot:**
Sensor Resolution:	• Slot 1: CFexpress Type B
• Actual: 26.52 Megapixel	• Slot 2: SD/SDHC (UHS-II) [U3/V30 or
• Effective: 25.2 Megapixel (5776 x 4336)	Faster Recommended]
Sensor Type: 17.3 x 13 mm (Four	**I/O:**
Thirds) MOS	1 x HDMI Output, 1 x 1/8" / 3.5 mm
Crop Factor: 2x	TRRS Headphone/Mic Microphone
Image Stabilization: Sensor-Shift,	Input1 x 1/8" / 3.5 mm TRRS
5-Axis	Headphone/Mic Headphone
ISO Sensitivity:	Output, 1 x USB Type-C, 1 x USB
• Photo: 100 to 25,600 in Auto Mode	Type-C Input/Output
(Extended: 50)	**Wireless:** 5 GHz Wi-Fi 5
• Video: 100 to 12,800 (Extended: 50)	(802.11ac) Video Output, Audio
Image File Format:	Output, Control
• JPEG, Raw	**Display Type:** Free-Angle Tilting
• 4:2:2 10-Bit via HDMIDCI 4K (4096 x	Touchscreen LCD
2160) at 50p/59.94p	**Display Size:** 3"
UHD 4K (3840 x 2160) at 50p/59.94p	**Resolution:** 1,840,000 Dot

slightly thicker body, both of which help it dissipate all that heat.

Recording media

Now on to the media options. The GH6 has two card slots. One is a CFexpress Type B while the other is a UHS-II SD card slot. Now, we would have liked to see the same media in both card slots. It just makes managing all your media easier. However, CFexpress Type B cards are not cheap, so some might appreciate the more affordable media option. However, keep in mind that you can't capture all data rates onto the SD card.

Whichever media you use, you won't have to worry about a record time limit. There is also the option to dual capture. There are three different ways to do it. First, if you're shooting at a data rate that the SD card supports, you can have the camera switch to the second card automatically when the first one fills up. You can also have it record the same shot on both cards at the same time and with the same quality. Finally, you can make it so that one card holds video and the other holds

photos. Hybrid shooters may find that really convenient.

Adding a rig to the Panasonic LUMIX GH6

The LUMIX G-series cameras have catered to filmmakers from the beginning, and the LUMIX GH6 is no different. That's why we wanted to try the camera out with a rig. We outfitted the GH6 with a SmallRig cage with a top grip handle and rails. To this, we added a follow focus, matte box, external view mount and battery mount.

Having shot with this setup for a while, we would probably recommend using just the cage with the grip. It's probably the most usable situation and it's only around $235 depending on the grip you go with. The rest of the additional accessories were a bit overkill for our situation, but they would have been great to have in different circumstances.

The follow focus is super awesome if you're using a lens that has hard stops at the extremes of the focus ring. Photo lenses that have an infinite spin of the focus ring make using the follow focus kind of difficult. However, you can

mark your in and out points on the focus ring as a workaround. We used the 12-40mm Olympus F2.8 lens, and it's really nice because it actually has hard stops on both sides of the focus ring.

Overall, it was nice to have the camera rigged out. It definitely makes it a lot more functional. The additional mounting points make it easier and quicker to get all of your gear set up and attached. The cage also gives you a chance to actually screw your accessory mounts into the cage, so they're secure and properly connected. Plus, having the handle and the grip makes it easy to go from a high to a low shot with no problem. You're able to be a lot more comfortable when you're shooting. Just beware, if you do plan to add several accessories to your rig, they do add up in cost. Make sure to leave room for them in the budget.

Marketplace
The LUMIX GH6 is competing in a different marketplace compared to when the LUMIX GH5s came out. There are more cameras with larger sensor sizes that offer very similar features. Let's look at a few other cameras you might consider and see how they compare to the GH6.

GH6 vs. Olympus OM-1
First up is the Olympus OM-1. It is $2,200 and features a 20-megapixel

stacked BSI Live MOS sensor. Its top resolution is DCI 4K 60p with a bit depth of 10-bit. Its top video frame rate is 240 fps in HD, and it uses an autofocus system called Cross Quad Pixel Phase-Detection. Rounding it out, the OM-1 has a 1.62 million dot 3-inch swivel touch screen LCD that can fully articulate. It accepts dual UHS-II SD cards.

GH6 vs. Panasonic LUMIX S5
Next up is another Panasonic camera, but it has a much larger sensor. It is the Panasonic LUMIX S5, priced at $1,700. It features a 24.2-megapixel full-frame CMOS sensor and can shoot up to UHD 4K in 10-bit with a recording time limit of 30 minutes. In HD, the S5 can shoot up to 120 fps. This camera uses a contrast-detect 225-Area DFD autofocus system and features a 1.84 million-dot rear display. That fully-articulating display measures 3-inches. It offers dual UHS-II SD card slots.

GH6 vs. Fujifilm X-T4
Next, the Fujifilm X-T4 has a larger sensor than the GH6, but it's not quite as large as the S5's sensor. Priced at $1,700, it has a 26.1 megapixel APS-C X Trans BSI CMOS sensor and can shoot up to DCI 4K in 10-bit with a record time limit of 30 minutes and at up to 240 fps in HD. It has a 425-Point Hybrid AF system and a 1.62m-Dot

3-inch Vari-Angle screen. It also has dual SD card slots.

GH6 vs. Panasonic LUMIX GH5 II
Last up is the Panasonic GH5 II. At $1,500, it has a 20.3MP Live MOS sensor with AR coating. It can shoot up to DCI 4K 10-bit and at up to 60 fps with no record time limit. Its autofocus system is a 225-Area DFD AF with advanced subject detection. The rear screen is a 3-inch 1.84 million dot free-angle touchscreen. It has dual UHF-II SD card slots.

Should you buy the Panasonic LUMIX GH6?
So, given all we've talked about, is the Panasonic LUMIX GH6 worth buying? Well, there are no lies in the camera's marketing. The GH6 is what it says it is. If you can benefit from the features it offers, you should look into buying it. But if you just need features that are also offered on the GH5 II, the GH5S or the GH5, the cameras are more affordable. You may find that you're just going to get more bang for your buck using those cameras. But if you could use things like image stabilization for anamorphic, the extra dynamic range boost or the extra cooling that the camera has, then the upgrade can be justified.

Summing it up
Did we like the Panasonic LUMIX GH6? You bet you. We have always been impressed by Panasonic's LUMIX G-series, and this one doesn't disappoint. Is it worth the money in the marketplace? Well, it depends on your perspective and what you already have. If you're already using Micro Four Thirds lenses, it's a good upgrade for more. For everyone else, you'll have to find out for yourself whether the features this offers exclusively are worth it for you. 🎥

Nicole LaJeunesse is a professional writer and a curious person who loves to unpack stories on anything from music, to movies, to gaming and beyond.

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Panasonic LUMIX GH6 mounted

Zoom Q8n-4K

by Sean Berry

Stellar audio capture and 4K video on a budget

Zoom
zoomcorp.com

STRENGTHS
• Stellar audio recording
• 4K video capture
• 4-track audio recording

WEAKNESSES
• No 60 fps capture
• Noticeable video noise
• No comprehensive zoom capabilities
• Fish-eye effect

SUMMARY
The Zoom Q8n-4K offers 4K video capture and 4-track audio recording, but is it enough to make this budget camcorder a must-buy?

RECOMMENDED USES
• Online Video Production
• Casual Video Production

$400

Zoom has a notable reputation for releasing quality, professional audio recorders. So, when Zoom combined its audio expertise with video functions with the original Zoom Q8, it seems like a winning pair. However, some felt that while the Q8 worked great as an audio recorder, its video features were a bit of a letdown — low video quality being a major blemish. Though the Q8 didn't deliver the video quality everyone wanted from it, Zoom rekindled their hopes with the new Zoom Q8n-4K Handy Video Recorder.

In this review, we will analyze how the Q8n-4K Handy Video Recorder fares as a video camera. We'll discuss its specs, see what Zoom has improved since the Zoom Q8 and determine whether the camera's worth your hard-earned dollar. For clarity, we're analyzing this camera from a video producer's point of view. So, our final verdict will lean heavily on its video performance. We will also compare the Q8n-4K with other affordable, portable video cameras currently out on the market to help you see what's out there and if this is the right option for you and your budget.

So, without further ado, let's put the Q8n-4K to the test.

Under the lens: the Zoom Q8n-4K
Image quality
One of the most notable and important changes since the Q8 is the Q8n-4K's ability to shoot video in 4K. Originally, the Q8 maxed out at 1080p Full HD at 30 frames per second (fps). While not bad, it left a lot to be desired. With 4K video capture becoming more widely available in both professional and consumer cameras, it felt like a missed opportunity. Thankfully, the Q8n-4K steps up its resolution, supporting video capture up to 4K at 24, 25 or 30 fps. The extra resolution is a welcome upgrade, though it would be nice to have the option to shoot in 60 fps for slow-motion shots. However, you can shoot at 60 fps in 1080p.

The Zoom Q8n-4K also houses a new sensor with a much higher pixel count than the Q8, jumping from a 3-megapixel 1/3-inch-type CMOS sensor to a 16-megapixel 1/2.3-inch-type CMOS sensor. With a slightly larger sensor — increasing the pixel count fivefold — there is a noticeable difference in the image quality between the two models. The extra pixels let you capture more detail and dynamic range, leading to a clearer, higher-quality image. ▶▶

Flippable rear screen

However, the camera still struggles to capture details in shadows and low-light conditions. We shot late in the afternoon during our test, so we had plenty of light and shadows to go around. In broad daylight, the camera captures a reasonable amount of detail for its price point. However, there's only so much detail its 16-megapixel sensor can capture. To compare, its image quality is about on par with a standard smartphone, which also averages around 12 to 16 megapixels.

While the Q8n-4K's image isn't groundbreaking, it's a noticeable improvement over the previous model. 16 megapixels should suffice for most use cases for video enthusiasts and hobbyists. As for pro filmmakers and content creators, they will likely find the quality of the pixel count and sensor product too limited.

Performance in low light
We took the Zoom Q8n-4K out to a nearby park. With the camera set to 4K at 30 fps, we experience some noticeable grain in our image's dark to somewhat dark areas. Even in a well-lit environment, there was grain. It was clear that the camera wouldn't fare too well in low-lit situations. The camera's lighting filters also do little to help its low-light image quality. When recording, we swapped between the settings and found that the camera's image was either too dark to capture details in the shadows or too bright to

capture elements like the sky or bright areas. If shooting with this camera outside, we would recommend using the auto setting. This ensures that, if there's a change in the lighting as the day progresses, the camera can try its best to correct it.

Though the Q8n-4K boasts a notable boost in image quality over the Q8, its performance in low light situations still struggles. There was noticeable grain when we tested the Q8n-4K in low light, even in its night mode. It's a huge qualm, considering it's marketed as a camera intended for capturing live concerts. For indoor concerts or night concerts, there will be noticeable grain, especially considering there's no ISO control. While the camera does feature two lighting modes for low light and in-door settings, they do little to reduce the grain.

Stabilization
Since the Q8n-4K has no onboard image stabilization, the footage we recorded at our local park came out looking quite shaky. It was hard to keep the camera steady while walking around. This isn't really surprising since this camera isn't designed to be a vlogging camera, so we're not going to hold it against the Q8n-4K too hard. Rather, we want to make it clear that this camera, even with its lightweight build, flip-out LCD screen and portable design, isn't a great vlogging camera without external stabilization.

The best, and probably the only way, to use the Q8n-4K as a vlogging camera is to mount it on a tripod or gimbal — unless you have a desk to place it on. If you want to shoot with this camera handheld, you will need a gimbal. Thankfully, it's simple to attach the Q8n-4K to a gimbal mount via its 1/4-inch-20 thread. However, it does drive up the overall price if you don't already own a gimbal. Most gimbals run between $100 and $150, creeping up the total cost into territories comparable to handheld, 4K cameras with built-in stabilization. While this might be a deal-breaker for some, most of the Q8n-4 K's intended uses, such as livestreaming and concert recording, won't require shooting handheld.

Camera lens
The Zoom Q8n-4K features a f/2.8, 150-degree wide-angle lens. Compared to the Q8's f/2.0, 160-degree lens, the Q8n-4 K's lens has a higher F-stop and a lower field of view. Overall, the image looks slightly darker than the Q8, which is great in our opinion. When shooting in outdoor settings, the Q8n-4K captures enough light to create a pleasing-looking balance of light with fewer blowouts.

There are five field of view (FOV) modes you can switch between. Options include a telephoto mode, a wide-angle mode and three modes in between those two extremes. The camera punches in for a tighter frame as you run down the list of modes, but none of the modes offer a substantial zoom function. In fact, one of the major flaws of the camera is its lack of a comprehensive zoom function. This is a glaring issue with the camera, especially if you're looking to use this camera to shoot at concerts. At the same time, the "zoomed" framing options zoom digitally, so there's a noticeable drop in quality the closer you get to the telephoto mode.

Additionally, there's an unflattering fisheye effect that's especially noticeable when using the wide-angle mode.

Sensor type: 1/2.3-inch-type CMOS sensor
Sensor resolution: Effective: 16 megapixels
Maximum aperture: f/2.8
Fixed focus: Yes
Angle of view: 150°
Zoom: None
Built-in ND filters: None
System: NTSC/PAL
Media/memory card slot Single slot: microSD/microSDHC/microSDXC [512 GB Maximum]
Video format:
• 3840 x 2160 at 24/25/30 fps (H.264/AVC, MPEG-4)
• 1920 x 1080 at 24/25/30/50/60 fps (MOV via H.264/AVC, MPEG-4)
• 1280 x 720 at 24/25/30/50/60 fps (MOV via H.264/AVC, MPEG-4)
Microphone recording angle: 120°
Channels: 4.0-channel
Audio format: WAV

Sampling frequency:
• WAV: 96.0 kHz
• WAV: 48.0 kHz
• WAV: 44.1 kHz
Display type: Non-articulating flip-out LCD
Display size: 2-inch
Display resolution: 320 x 240
Self-timer: 3, 5, 10 sec
Remote control: Optional
Scene modes: Preset: Yes
Built-in mic: Yes
Built-in speaker: Yes
Built-in light/flash:
• Light – No
• Flash – No
Accessory shoe: None
Tripod mounting thread: 1/4-inch-20 Female
Video I/O: 1 x micro-HDMI output
Audio I/O:
• 2 x 3-pin XLR mic/line (+48 V Phantom Power) input

• 1 x 1/8" / 3.5 mm TRS stereo headphone/line output
Power I/O: 1 x USB Type-C Input
Other I/O:
• 1 x USB Type-C data/video output (shared with power input)
• 1 x USB Type-A control input
Wireless: Bluetooth control (adapter required)
Battery:
• Rechargeable lithium-ion battery pack, 3.7-4.2 VDC, 1600 mAh
• Max runtime: 2.5 hours per charge
Charging method:
• AC adapter
• USB
Charging time: 4.5 hours
Power adapter: 5 VDC
Dimensions (W x H x D):
• Mic Arm Lowered: 2.7 x 2.6 x 6.3-inch / 68.0 x 65.0 x 159.0 mm
• Mic Arm Raised: 2.7 x 5.3 x 5.3-inch / 68.0 x 135.0 x 134.0 mm

This isn't unique to the Q8n-4K; the Q8 also had a fisheye look. It would be nice if we could choose whether or not to use the fisheye effect, but the other FOV settings offer a more standard frame, so at least we have other options to fall back onto.

Image settings
When it comes to in-camera image adjustments and presets on the Q8n-4K, there are a few. The camera features just a few brightness adjustments: bright, normal and dark. These lighting presets are accessible through the camera's BRIGHT button placed on the right side of the LCD screen. Essentially, these modes digitally brighten or darken the image. You can't customize these modes, so they're only useful in specific situations. Sometimes, they

will work, and sometimes they won't — you can't customize the boost in brightness levels to your particular shooting situation.

In total, there are five scene presets — two more than the Q8. The lineup of presets includes Indoor, Outdoor, Nighttime, Concert and Auto. Each preset intends to adjust the camera's lighting settings based on your shooting environment. So, for instance, if you're recording a concert, you would enable its Concert preset in its SCENE menu These presents are nice in some instances, but since they're not adjustable, they at times feel limited.

Storage
Storage-wise, the Q8n-4K has a single card slot. This slot accepts microSD, microSDHC and microSDXC cards up

to 512 GB. The slot is located at the bottom of the back of the camera. It's easy to access, but you do have to open the LCD screen to access the media card. This isn't really an issue, but it might add extra steps if you have the LCD screen closed and the retractable mic arm down.

LCD screen
The Zoom Q8n-4K 2-inch LCD screen comes with some good and some bad. Starting with the good, we like that the screen can flip out. This feature makes the camera very friendly for livestreamers. Also, the screen's quality is good enough to help when framing the shot. Unfortunately, the screen's resolution is just 320 x 240. You don't have to get too close to the screen to start seeing its pixels. We

Supports a mini-SD card up to 512 GB

would have liked to see a screen with at least 1280 x 720 pixels (720p HD).

Also, the Q8n-4 K's screen is less flexible than the original Q8's screen. You could adjust the original's screen either left to right or upwards, whereas, with the Q8n-4K, you can only extend the screen left to right. While not a deal-breaker, you now have to bend down to check the screen if it isn't exactly level with your eyeline.

Menus

Navigating through the Q8n-4K is quite simple and we love that. On the side of the LCD screen is an arrangement of buttons assigned with specific functions depending on what mode you're in. Nevertheless, the buttons are placed next to the function's name displayed on the screen. So, for example, the camera's FOV button is next to the FOV text and menu on the screen. You navigate through the menus by pressing the same button. It follows the same setup in the settings menu: the buttons align with their function on the LCD screen.

Though navigating through the menu is simple, it can be sometimes tedious. For instance, when navigating through a long list of settings, like in the audio menu, if you pass the setting you want or you want to go back to a previous setting, you have to click multiple times to get back to the setting. A D-pad or touchscreen support

could have fixed this. We wish either one of these solutions would have been included; it would have made the navigation even better. Since there aren't a ton of functions and settings to switch between, its simple yet cumbersome navigation is manageable.

Audio recording

Now let's talk about the camera's audio recording capabilities. What the Zoom Q8n-4K lacks in video features, it makes up for in audio features. The camera comes with two unidirectional condenser elements in a 120° X/Y configuration. The mic mounts onto the camera's retractable arm and is detachable. From our experiences with the mic, we found that it works great. It captured a clear recording,

> NAVIGATING THROUGH THE Q8N-4K IS QUITE SIMPLE AND WE LOVE THAT.

even when it was across the room we were recording in. Plus, the camera supports real-time monitoring via a 3.5 mm headphone jack.

Two XLR Inputs

One of the highlight features is the Q8n-4 K's dual XLR inputs. With two XLR mic/line inputs, phantom power and a switchable -20 dB pad, you can plug your dynamic or condenser mic directly into the camera. You can also control each input individually with its accompanying volume dial next to the input plug. It's also straightforward to mute and unmute inputs. There are three buttons controlling

the inputs' power on the camera's back. The three inputs include one for the top mic, channel 1 and channel 2. When the input is on, the button will glow red.

You can also plug an instrument into the mic input, allowing for multi-layered recording. It can also handle the main outputs from a mixing console. All-in-all, it's a unique feature that you would be hard-pressed to find on a camera at a competitive price point.

Audio settings

While there might not be many settings you can change in terms of video on the Zoom Q8n-4K, there are plenty of audio options to play around with. In the camera's mixer mode, you can change things like panning and level, plus you can apply audio effects, such as compression, limiter, leveler, de-essing or a noise gate. Additionally, the camera can adjust the low cut filter's frequencies, with options including 80 Hz, 120 Hz, 160 Hz, 200 Hz and 240 Hz. All of these settings are adjustable for all three inputs.

Microphone

Sitting on top — or on the back, depending on if you have it clicked down — the Q8n-4 K's XYQ-8n capsule utilizes two matched unidirectional condenser elements. It's designed with a 120-degree X/Y configuration. Alternatively, you can swap out this mic for Zoom's other mic capsules. You will have to purchase this separately, though. We were quite impressed with how well the microphone works. It captures clear audio, which you can monitor using any standard pair of headphones. It comes with a windscreen, which does some work in improving the audio quality. However, one minor qualm we have: You have to detach the microphone every time you want to put the windscreen on. It's not a deal-breaker, but it can be a minor nuisance.

We do like that you can monitor the audio with its built-in headphone jack.

Dual XLR mic/line inputs

It makes it simple to ensure the audio you're capturing is quality.

Livestreaming/webcam functionality

One of the best aspects of the Q8n-4K is its simplicity. It's easy to pick up and use right out of the box. Its easy-to-use nature was most prevalent during our livestream/webcam test during our testing. All we had to do was plug it into one of our office computers, select it as our primary camera and it was ready to go. We streamed on Twitch using the Q8n-4K and had no issues regarding connectivity. Everything worked as it should.

As for the image quality of the stream, we weren't as impressed. While not horrible, there was some noticeable grain and lost details in shadows. There are definitely other webcams on the market that would provide a better image than the Q8n-4K. However, there aren't as many webcams at the same price point that would offer a similar audio experience, especially for streaming musicians.

Power

With the Q8n-4K, you receive a rechargeable Li-ion battery. In total, the camera lasts about two and a half hours on a single charge. Not a crazy-long battery life, but not too shabby either. You want to shoot for at least

two to three hours of battery life, which should suffice for most situations.

You can also power the camera via USB or an AC adapter. We recommend this option if you want to use the camera for livestreaming or as a webcam — depending on how long your calls typically are. Streams and calls can easily go over the 2.5-hour battery life.

Marketplace

For $50 dollars less than the Zoom Q8n-4K, the $349 GoPro HERO10 Black features a 23.6 MP sensor capable of capturing 5.3K video at 60 frames per second. It's true the HERO10 Black isn't a camcorder, but it is a great option for those looking for quality video capture on the go. The video quality outmatches the Q8n-4K in many regards; however, the camera doesn't offer as much flexibility for audio capture. The HERO10 Black features three microphones with built-in noise reduction but doesn't offer multi-track recording. The GoPro also supports livestreaming in Full HD and utilizes HyperSmooth 4.0 stabilization. While it doesn't offer as many audio functions, it offers higher quality video capture and can be used as a vlogging camera more efficiently.

For twice as much, the $800 Panasonic HC-VX1 4K HD camcorder can shoot 4K video at 30 fps with its back-illuminated 1/2.5-inch MOS sensor

and works effectively in low light. It also utilizes an f/1.8 to f/4 24x Leica Dicomar zoom and lets you record up to three camera angles at once using its wireless Multicamera feature. Though, you would need additional cameras or two smartphones to use that feature. It's a more expensive option, but this camera offers more framing options and is more capable in low light.

Last, we have the $950 Sony FDR-AX43. This is a compact camcorder that features a Carl Zeiss Vario Sonnar T lens, capable of shooting 4K video and using a 20x optical zoom. It also supports dual-video recording in XAVC S or AVCHD formats.

Summing it all up

We're not going to beat around the bush here. The Zoom Q8n-4K isn't a spectacular camera based on its video capabilities alone. What really sets it apart from other comparable cameras is its audio features. Its capability of recording with 4-tracks beats out the rest of the competition. It's a good camera for musicians looking to record their jam sessions with clean, crisp audio and some type of video to accompany it. It also does a decent job at being a webcam, but there's likely a better option if you're getting this camera specifically for non-music streaming. Beyond those use cases, anyone looking to record video in a professional setting, such as filmmaking, will likely be let down.

In many ways, the Zoom Q8n-4K feels like a great, affordable audio recorder with bonus video features. So, if you're looking for a budget-friendly camera that prioritizes audio and has some type of video recording capabilities, the Zoom Q8n-4K may be your camera. Anything above that, we recommend considering other, higher-end options. **V**

Sean Berry is Videomaker's Associate Editor.

THE BEST LIGHTS
FOR VIDEO PRODUCTION — 2022

Lighting needs run the gamut, from huge budget productions to small, DIY vloggers, and there's something for every niche. This article will explain what to think about before buying lights and provide a list of the best video lights currently on the market.

There are several variables to consider in choosing the best lights to use for your next project. Color temperature, color rating, lighting type and power options are all important regardless of how the light will be used. Light quality, versatility and price point will need to be considered, as well.

First, we'll highlight our favorite lights for a variety of applications. Then, we'll take a closer look at the key aspects for a better understanding of how to choose a light or light kit for your next production.

Best fresnel
Litepanels Sola 6+
The Sola 6+ is a daylight-balanced 6 inch LED Fresnel and costs $2,000 dollars. It has a beam control of 16 to 67 degrees. It's supposedly over 50 percent brighter than the Sola 6. It includes 8-way barndoors and also dims from 0 to 100 percent. It also offers the same LED lifespan, heat-free output and includes its 120-240 VAC, 50/60 Hz Power Supply.

Best panel
Zylight Go-Panel Bi-Color LED Light
This Zylight LED Panel features +/- green and magenta, a USB port for firmware updates and DMX controls. It features Zylight's patented Active Diffusion, where you can electronically adjust diffusion with the turn of a knob. This allows for easier adjustments of diffusion. It also features a 26-degree beam. Color temperatures range from 3100K to 6200K. ▶▶

Litepanels Sola 6+

Zylight Go-Panel Bi-Color LED Light

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The light panel includes a AC power supply and can also be powered by a 14.4V camera battery through an attached plate.

Best multi-purpose light
Litepanels Gemini 1×1 RGBWW LED Panel

The Litepanels Gemini 1 × 1 is a LED soft panel. It features multiple lighting modes including CCT, Hue, Saturation, Gel presets and an effects mode. CCT has six factory presets ranging from 2700K to 10,000K. HSI mode allows you to adjust hue, saturation and intensity. THe gel mode gives you a variety of filters to choose from. The light is dimmable from 100 to 0.1 % without flicker.

Best kit
Dracast S-Series LED500 Plus Bi-Color LED 3-Light Kit with NP-F Battery Plates

This kit comes with three daylight LED light panels with pre-installed battery plates, as well as stands, barndoors, diffusion filters and soft cases for each light in addition to a hard case for the kit. The lights are rated at CRI 95 and offer 10-100 % dimming. They also feature Dracast IRR, which allows for control of multiple lights through a single fixture.

Best budget light
Nanlite LitoLite 5C RGBWW Mini LED Panel

The Nanlite LitoLite 5C RGBWW Mini LED Panel is a portable, bright light that's small enough to fit right into your pocket. It features an internal Li-Ion battery and charges through USB-C. As for its color temperature range, its adjustable from 7500-2700K with green to magenta shift. Additionally, you can utilize the light's 360° hue control with 100 levels of color saturation adjustment and 15 pre-programmed adjustable lighting effects.

The Nanlite LitoLite 5C RGBWW Mini LED Panel provides great, portable lighting, and is ready to use at any time anywhere.

Features we considered

The following features are not all weighted equally for each category. However, when you're looking for the best lights for video production, you must consider all of them, along with the price, before making a purchasing decision.

Color temperature

Color temperature is a measure of the color quality of a light measured in degrees Kelvin. It's an important factor, especially when working with multiple different light sources. If we were shooting inside a house lit by Tungsten lights rated at 3,200 kelvin and we balance accordingly, the light inside will appear white, while the daylight beaming through the windows will appear blue. Inversely, if we were to white balance inside that room for the light coming in through the window, those Tungsten light sources would appear orange. Most of the time, the goal is to unify the color temperature of all of your light sources, either through the use of gels or simply by choosing light sources that all output at the same color temperature.

As you shop, consider what color temperature will best suit the type of work you do. Will you need lights that are balanced for indoors 3200K, outdoors (5600K) or maybe ones that offer variable control and can provide a wide range of color temperatures? The answer will depend on where you will spend the most time shooting and what other lights you may already have in your kit.

Color rating

Color rating is a measurement of how well the light system will accurately reproduce color. The Color Rating Index (CRI), developed in the 1960s, measures how well the light will reproduce the full range of colors in a subject, compared to a standardized source. 100 is perfect color rendition score; a CRI 95 or above is preferred.

Television Lighting Consistency Index (TLCI) is a similar but more modern measurement. Instead of relying on a human observer to measure color variance, TLCI measures color changes that can be detected by a video camera. A TLCI score above 90 is acceptable.

Light quality

You'll also need to consider whether you want to light your scene using hard or soft light. Hard lighting is direct, creating lots of contrast with hard shadows; it feels very dramatic and accentuates textures and detail. Hard light is specular, collimated and highly directional. Most of the time, hard lighting will come Fresnel lights, which use a special lens to focus a beam of light to suit your needs.

Soft lighting is diffused and seems to wrap around a subject. It leaves shadows with gradual, soft edges between light and dark. Soft lighting is often thought to be more flattering to suit your needs.

Litepanels Gemini 1×1 RGBWW LED Panel

Dracast S-Series LED500 Plus Bi-Color LED 3-Light Kit with NP-F Battery Plates

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subjects, making people appear more youthful and reducing wrinkles. Soft lighting adds a sense of depth to a subject. In general, if you need soft light, you'll be looking at panels and lights with soft boxes.

Hard and soft light each create a specific feeling in viewers. Knowing how lighting will affect an audience allows video producers to create a specific tone, and ultimately, tell stories more effectively.

Power
Next, you'll have to consider how the light will be powered: AC, battery or both? Someone who works primarily in a studio will have very different needs than a run-and-gun documentary crew. Along with power options, you'll also want to know the lights draw and output. How much energy does the light use, and how much light does it produce? Output can be measured in terms of wattage (w), lumens, candela, lux or foot-candles (fc).

Lighting types
Finally, let's look at the four main types of light used in video production. Each has its advantages and disadvantages, and some types are more affordable than others.

HMI
HMI lights use mercury vapor and metal halide to create a high output of light with decent energy efficiency. The light provided from HMI's is very similar to that of natural sunlight (6000K), making them daylight balanced. These lights cost a lot up front but can save on power costs in the long run. On the downside, they require bulky ballasts and are not fully dimmable. You're not likely to encounter one of these large, expensive lights unless you're working on a professional film set. We don't recommend HMI lighting for the average video producer.

Tungsten
Tungsten lights are like super-powerful versions of the old incandescent household light bulb. At 3200K, Tungsten is the standard color temperature for indoor lighting. Other color temperatures will require gels. Tungsten lights are lower-cost and have good color rendition. On the downside, they get hot, they require lots of power and the bulbs require

sensitive care. Always handle tungsten lamps with gloves, even when cool, since oil from your fingers can cause the lamp to explode. For decades, Tungsten lighting dominated on set, but with new technology, fluorescent and now LED lighting is becoming more prevalent. This is thanks to relatively low power draws and cooler handling temperatures.

Fluorescents
Fluorescent lights use gas to create a glow, which is amplified by a layer of phosphor coating. These lights are very energy efficient and can have a range of color temperatures from 2700K to 6500K. Fluorescent lighting is compact and generates little heat. Regular-use fluorescent lighting can create problems with 'flicker' and color rendition, but fluorescent lighting made specifically for video doesn't usually suffer from the same issues. Professional fluorescent lights have special ways to negate the flicker and poor color quality inherent in home-use fluorescents, but they are considerably more expensive.

LED
Light emitting diode (LED) units are energy efficient but are known to produce limited output. LEDs can provide variable light across the RGB spectrum and often feature bi-color functionality to allow easy switching between daylight and Tungsten color temperatures. They are a fast-growing part of the landscape and are increasingly being used in Fresnel light fixtures as well as panels. LEDs have an extremely long lifespan, allow for full dimming and are very rugged and safe units compared to the other bulbs. They can be more expensive, but prices are coming down every year as this technology becomes more widespread and economical.

Conclusion
Knowing your needs and how they fit into the current marketplace makes it easier to get the right tools. Becoming familiar with the range of lights available will help you choose the right tool for the jobs ahead. ▮

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These are the best cinema cameras on the market today.

BEST
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The digital cinema camera is the modern-day iteration of the traditional film production camera. These cameras aim to reproduce the latitude and tonal qualities of celluloid while eliminating huge portions of the typical film workflow. Determining the best cinema cameras on the market today can be complicated.

Now, in addition to these workflow advantages, the image quality produced by today's cinema cameras often meets or exceeds what is possible when shooting on film. And that's not to mention the increase in creative control you get from shooting in a digital format.

At the end of this article, we'll go over some of the special considerations unique to this form factor. But first, here's our list of the best cinema cameras on the market today.

Best all-around cinema camera
Sony FX3

The Sony FX3 is a feature-packed well-rounded camera. It's user-friendly because it's easy to use. If you've shot videos with any kind of dedicated camera before, mirrorless or DSLR, you'll feel right at home using the FX3.

While the FX3 only captures up to UHD 4K, it still offers 10-bit 4:2:2 internal capture or up to 16-bit RAW externally. The camera features a top frame rate of 240 frames per second in HD and delivers fantastic 120fps in 4K. Also, the camera's dual card slots are another great feature. It has dual media slots for either SD/SDHC/SDXC cards or the CFexpress Type A. Additionally, the Sony FX3 full-size XLR inputs. When camera manufacturers offer mini XLR inputs, it's always a letdown. Videographer workflows become more complex when cameras offer only mini XLR inputs. Thankfully, the FX3 offers full-size XLR inputs,

making this a more dynamic camera compared to mini-XLR input cameras. The camera also has an ISO range of 80 to 406,600, 5 axis in-body image stabilization, and 14 + stops of dynamic range. While Sony claims the camera has 15 + , our test-

Sony FX3

ing didn't confirm this claim. However, this isn't important because the image quality difference between 15 + and 14 + is very minimal.

The FX3 is 640 grams and 3.06 inches x 5.11 inches x 3.33 inches. It's slightly heavier than the a7S III by 26 grams. Overall though, their sizes are similar. However, the FX3's handle feels great to hold. With the handle, low-angle handheld shots are much easier to do. Its rear screen is a 3 inch 1,440,000-dot LCD and supports touch functions, like navigating through the menu and touch auto-focus.

The Sony FX3 is a well-rounded camera offering something for everyone. It's easy to pick up and shoots pro-quality video.

Best budget cinema camera
Blackmagic Design Pocket Cinema 4K

The Blackmagic Design Pocket Cinema 4K uses a Micro Four Thirds sensor to capture DCI 4K video with up to 13 stops of dynamic range. It's also the first camera from Blackmagic Design to feature dual native ISO. This should help improve the historically limited low-light performance in Blackmagic cameras.

The camera can record DCI 4K, UHD 4K and full HD video at standard frame rates, with off-speed frame rates of up to 60 frames per second (fps) in DCI 4K and 120 fps in windowed HD mode. Supported codecs include 10-bit ProRes and 12-bit CinemaDNG RAW.

With the addition of dual native ISO, the Pocket Cinema Camera 4K can shoot at ISOs up to 25600, a significant improvement over its predecessor. Blackmagic Design also promises a reduced crop factor with a 4/3 sensor specifically designed to match MFT lenses.

Best run-and-gun cinema camera
Sony FX6

Offering both a compact form and cine-style imaging, the Sony FX6 delivers on so many fronts. It's able to capture up to 15 + stops of dynamic range, uses the Sony S-Cinetone gamma, and up to 10-bit, 4:2:2 XAVC-I recording. This camera uses a 4K full-frame Exmor R sensor paired alongside a BIONX XR Exmor R sensor with a BIONX XR engine. It uses a base ISO of 800 and features an ISO 12800 high-sensitivity mode aiding greatly in low light conditions.

The FX6 body is highly portable, weighing under 2 lb, allowing you to hold the camera with ease through your shoots. Additionally, the body measures 6 x 4.6", allowing for simple transportation. It also has features like phase-detection autofocus with both Face Detection and real-time Eye autofocus. The camera offers both auto and manual ND filter settings and a 3.5" LD monitor.

The Sony FX6 is a highly capable camera that's easy to use throughout an entire shoot.

Special considerations for cinema cameras

Not all cinema cameras are created equal. Let's go over some of the most important features to look for as you shop.

Form factor

Cinema cameras are designed to be true video-first cameras. They come complete with the external controls and input/output options you'd commonly find on a professional camcorder. The most obvious difference from the outside is the cinema camera's interchangeable lens. But even though cinema cameras look a lot like camcorders, they produce an image that looks more like actual film.

Larger than a DSLR or mirrorless camera, cinema cameras also have space for more accessory mounting points. This helps reduce reliance on full camera rigs or cages. Cinema cameras usually also have XLR inputs as well as HDMI and/or SDI out for sending a clean video signal to an external recorder.

Dynamic range

One of the main advantages of using a cinema camera is the expanded dynamic range these cameras typically offer. A larger dynamic range means the camera captures deeper shadows and brighter highlights in the same shot without losing detail.

Cinema cameras are designed to capture video with a dynamic range that, at least, matches that of film: around 13 stops. Modern cinema cameras can reproduce 14 or more stops of dynamic range. This gives you a more cinematic image and incredible flexibility during the color grading process.

Sensor size and dynamic range

One way camera makers achieve this is through the use of larger sensors with larger pixels. This allows the sensor to gather more light at once, which increases low-light performance and reduces noise. It also allows each pixel to accept more light before beginning to clip from overexposure. That means you get more information in both the shadows and the highlights.

ISO and dynamic range

ISO is a factor here as well. Cameras capture the least noise at their native ISO. Therefore, this is also the point at which they capture the greatest dynamic range. At the native ISO, cameras can capture deeper shadows before noise is introduced. Some cinema cameras now

feature dual native ISO. This feature originated in top-end, Hollywood level cinema cameras and is now trickling down into more accessible camera models.

Recording formats

Cinema cameras will typically offer a number of high-quality codecs to fit various workflows. ProRes and DNxHD codecs are especially common, and some kind of raw recording is now all but standard.

As you shop, look for recording formats that give you enough information to freely grade and composite in post-production. Just make sure they don't bog down your workflow.

RAW recording

Raw recording captures unaltered information directly from the sensor to provide maximum flexibility for color grading and compositing in post-production. It preserves all of the dynamic range and color information captured by the sensor. Raw footage does require post-processing, however, and takes up a lot more space on a storage drive. Most times, you'll need an external recorder to capture raw video.

Log picture profiles

Logarithmic picture profiles, commonly referred to as log, offer a more practical alternative to shooting raw. Log picture profiles assign exposure values along a logarithmic curve rather than a linear curve. This process produces a flat image that preserves more color information and detail in the shadows and highlights. In post-production, colorists apply a LUT to transform this extra-flat footage to a more natural-looking color space.

Bit depth and color reproduction

Connected to this are color science and bit depth. Each camera manufacturer has developed a particular way of capturing and recording color information. That's why Sony cameras produce an image that looks different from one out of a Canon camera, even if all the settings match.

However, what's more important is the amount of color information a camera can record. Typical consumer cameras and most DSLR and mirrorless cameras are limited to recording at a bit depth of 8 bits. Cinema cameras, however, often capture 10-, 12- or even 14-bit video when shooting in a high-quality codec or raw format. Again, it's all about flexibility. The more color information your camera can deliver, the more latitude you will have in post-production. This, in turn, means you'll be better able to craft a unique look for your finished video.

Blackmagic Design Pocket Cinema 4K

Sony FX6

Additional cinema camera controls and settings

Since cinema cameras aim to give the DP ultimate creative control, they often include some handy bonus features. Higher maximum frame rates allow for slow-motion recording, and anamorphic de-squeezing helps when working with anamorphic lenses. Global shutter is another feature that allows cinema camera to behave more like traditional film cameras. This also eliminates rolling shutter issues that cause straight lines to bend during quick pans. In general, these extras are there to make it easier to capture the desired image.

Final thoughts

While these features help distinguish cinema cameras from other camera types, it's still important to consider universal features like sensor size, resolution, and connectivity. You'll also need to think about how the camera will fit into your existing kit and production workflow. For an overview of the most important features, read How to buy a camera.

Once you know what you need, you can pick out an awesome camera perfect for your next production. ∎

You can comment on this article by going online: www.videomaker.com/?p= 97648

BEST **MICROPHONE** FOR **VIDEO PRODUCTION** 2022

Whether you're recording audio for a commercial, a wedding or your next feature film, you need the best microphone possible.

Ever watch a low-budget movie and wonder, "How did this film make the cut?" The cinematography may have been average, the story derivative but — the sound! The quality of the sound design may be the reason the film made it onto the screen. Surprisingly, many film festival programmers rate sound quality as the element they weight most heavily when looking at entries. In fact, sound in cinema can be very deceptive. Having the best microphone possible is an important element in achieving good sound.

Techniques that many films use — such as audio editing, ADR (automated dialog replacement, also known as dubbing or looping), remixing and sound sweetening — occur in post-production and can be very time-consuming as well as expensive.

Because sound plays such an important role in audience perception, it's important to get the audio right. That means you need the right microphone for the job. Here are our picks for the best microphones for video production in several categories. At the end of the list, we'll go over the most important factors to consider as you shop for your next mic.

Best wireless digital microphone
Røde Wireless Go

STRENGTHS:
• Compact, lightweight build
• Up to 70m range
• 128-bit encryption for detailed audio
WEAKNESSES:
• Not cheap

Rode describes its Wireless GO microphone as an "ultra-compact wireless microphone system," that features a clip-n-go design and lightweight form factor overall. It's got plenty of features going for it, but the highlight of the Wireless GO has to be that it sits at the cross-section of usability and performance.

Not only does the GO's transmitter and receiver weigh a paltry 31g each, but they offer what Rode calls "universal compatibility with cameras, mobile devices and computers." On top of that, the GO features Series IV 2.4GHz digital transmission as well as 128-bit encryption and range up to 70m.

One of the main downsides to the GO is price – at $300, this is a pricey microphone system. But for those willing to spend this much, the GO is well-equipped to fulfill a wide range of use cases. ▶▶

Røde Wireless Go

Best analog lavalier microphone
Sennheiser evolution wireless 100-p G4
STRENGTHS:
• Broadcast quality sound
• Build quality
• Industry-standard
WEAKNESSES:
• Price

The Sennheiser evolution wireless 100-p G4A series is a rugged all-in-one wireless system with high flexibility for broadcast quality sound. The system has a transmission range of up to 330 feet and 8 hours of operation time.

An update to the industry-standard evolution wireless mic system series, Sennheiser claims that the user interface of the 4th-gen ew 100-p series will allow for faster set-up and better control thanks to 12 compatible frequencies. Additionally, the ew 100-p output power goes up to 30 mW. The lighter aluminum housing of the SKM 100 G4 allows for easier use.

Included in the latest ew 100-p series offerings are a 135-p G4 Portable Handheld Set and two Portable Lavalier Sets, an ew 112-p G4 (omni), an ew 122-p G4 (cardioid). Also available is the ew 100 G4 ENG Combo Set, which offers both plug-on and bodypack transmitters with an omnidirectional ME 2-II clip-on microphone. The new systems are compatible with all previous evolution wireless systems.

Best handheld microphone
Shure SM58
STRENGTHS:
• Rugged construction
• Great sound quality
• Built-in pop filter
WEAKNESSES:
• Optimized for vocal recording

Recently celebrating its 50th anniversary, the SM58 wired handheld mic has long been known as one of the world's most rugged and affordable professional dynamic microphones. The SM58 is a cardioid mic with a frequency response of 50Hz to 15kHz tailored to deliver warm and clear vocal reproduction.

Even in extreme conditions, the SM58 is designed to target the main sound source while minimizing background noise. The Shure SM58 has a built-in spherical filter to minimize wind and breath "pop" noise. It also has an internal pneumatic shock-mount system which is designed to help reduce handling noise.

Best shotgun microphone
Sennheiser MKH-416
STRENGTHS:
• Industry-standard sound quality
• Built to last
• Suitable for adverse environmental conditions
WEAKNESSES:
• Expensive

While not a small investment, the Sennheiser MKH-416 Short Shotgun Interference Tube microphone is an industry-standard that can be spotted on Hollywood sets and professional independent productions alike. The mic is responsive to frequencies between 40 and 20,000 Hz and has a hypercardioid pickup pattern that begins to narrow into a lobar pattern above 2 kHz. This particular microphone has extremely powerful directivity meaning you will always get an incredibly tight and focused recording, no matter where you're recording.

When your work takes you outdoors, you're bound to encounter humidity and condensation, which can cause many mics to fail. The MKH 416-P48U3's RF condenser design makes it highly immune to moisture, allowing you to reliably capture high-quality audio in normal and adverse environmental conditions. The MKH 416-P48U3 also has a foam windscreen to reduce unwanted wind noise.

Designed specifically for film, radio and television work, the MKH-416 has a durable all-metal body ready for hard use on set or on location. It's expensive but the MKH-416 is a quality product that you can rely on.

Best voice-over microphone
Røde NT1
STRENGTHS:
• fresh, redesigned look
• measures just 4.5dBA of self-noise
• 10-year warranty
WEAKNESSES:
• tough to record loud sources with

As Røde's new 1-inch diaphragm condenser microphone, the NT1 offers several differences from its predecessor, the NT1-A. In fact, Røde asserts that the only shared component between the two products is their mesh grille.

The newer microphone of the bunch focuses on balanced sound that expertly blends midrange sounds, high frequencies and stellar bass. Additionally, the NT1's transducer is suspended inside the microphone, a move that's meant to "minimize external vibrations at the capsule level," according to Røde.

Impressively, the NTI claims to measure just 4.5dBA of self-noise, making it an extremely quite microphone that shouldn't add to the sounds of the environment it is in.

Best podcasting microphone
Røde Procaster
STRENGTHS
• Voice-friendly frequency response
• limits audio-distorting noises and sounds

• 10-year warranty through Rode
WEAKNESSES
• Limited by its status as an XLR mic

There should typically be at least a little skepticism whenever a company rolls out a marketing phrase like "broadcast-quality sound." With the Røde Procaster, however, the phrasing is not just warranted, but validated. The Procaster offers a tight polar pattern and a frequency response designed specifically for voices, making it a great companion to even the deepest voices among the thousands of podcast personalities in the world today.

The Procaster also features an internal pop-filter, which is meant to keep any sounds that have the potential to distort your podcast's audio output to a bare minimum. It's a rather pricey piece of equipment, especially for those who have just entered the realm of podcasting. But as your listenership grows, they'll thank you for recording with a powerful microphone like the Røde Procaster.

Best camera-top microphone
Røde VideoMic NTG
STRENGTHS:
• Safety channel
• Long battery life
• Rechargeable battery

WEAKNESSES:
• Larger than previous models

Røde's NTG shotgun microphones are typically known for being lightweight, on-the-go microphones capable of delivering broadcast-quality audio. The VideoMic NTG offers everything that we've become accustomed to in the NTG series, combined with features from the VideoMic lineup.

The VideoMic NTG can be used in many different setups: on-camera with DSLRs or smartphone rigs, on a boom pole or as a USB mic for recording voiceovers, podcasts or live streaming.

This mic has a highly directional super-cardioid polar pattern and infinitely variable gain control. Users are able to adjust the mic's output from mic level to line level to headphone level. There is also an Auto-sensing 3.5mm output that automatically switches between TRS and TRRS. It would work for both cameras (TRS) and mobile devices (TRRS). No need for adaptor cables.

The VideoMic NTG has a high-pass filter (75Hz or 150Hz), – 20dB pad, high-frequency boost, and safety channel. Additionally, the switchable safety channel records an additional channel

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full screen
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at -20dB if the main channel just so happens to clip.

The microphone uses the Rycote Lyre shock mounting system with cable management. Also, it works with a sliding rail mount.

Best budget shotgun microphone
Audio-Technica AT8015
STRENGTHS:
• Roll-off positions switch
• Solid construction
• Battery or phantom powered
WEAKNESSES:
• Extra-long form factor

The Audio-Technica AT8015 Shotgun has proven to us it is currently the best budget microphone, offering the most features for the lowest price.

To give you an overview of this mic, the Audio-Technica AT8015 Shotgun is a line gradient condenser, phantom or battery-powered, shotgun mic. Its primary focus is to capture over long distances. It is positioned to do that thanks to its sound rejection design, rejecting sound coming from the sides and the rear. With its ability to capture sound from long distances, it can be used in a number of situations. Those working in TV broadcasts can use it to capture audio of a news reporter or interviewee. Also, those working on professional or personal video projects should be able to use this mic to capture audio clearly without having to get the mic in the shot. Its versatility at a low price is one of the reasons it is the best budget microphone out there right now.

Additionally, the AT8015 Shotgun features a roll-off position switch. What does this switch do? It reduces the pickup of low-frequency ambient noise. So, for instance, the mic will cancel out anything like traffic, room reverberation and mechanically coupled vibrations.

Best USB microphone
Samson Q9U XLR/USB
STRENGTHS:
• Stout build quality
• Low Cut Filter
• Mid-presence Boost
• Mute button
• XLR and USB C output
WEAKNESSES:
• Lots of handling noise
• USB and XLR output are different sound quality

The Samson Q9U is an impressive USB microphone that all professional podcasters should consider trying out. With USB-C and XLR outputs, it's a versatile microphone that gets the job done.

There's a lot to like about the Samson Q9U. Its XLR and USB-C outputs allow the mic to work with both mac and windows computers via USB. You can also connect the mic with any audio interface, mixer or preamp. The Samson Q90's low-cut and mid-presence controls also help give your voice a midrange bump while filtering out rumble. Samson also included a handy mute button that silences both the USB and the XLR outputs.

So, if you need a professional, quality USB microphone that's ready

to record no matter your setup, the Samson Q9U won't disappoint.

Best in-line microphone preamp
Soyuz Microphones Launcher
STRENGTHS:
• 26db of gain
• Robust build quality
• Vintage tone transformer
• Will make any dynamic sound better
WEAKNESSES:
• It's pricey for a single-channel

Soyuz's Launcher is an inline mic preamp that goes between the microphone and the preamp. Since most dynamic and ribbon microphones have low output, the Launcher boosts the input to the final destination by 26 decibels. Its gain comes from its hand-wound transformer and has an analog tone. This gives the mic a unique, desirable tone. With the improvements to the input gain, the Launcher will lower the signal-to-noise ratio of the destination preamp.

While on the pricey side, the Soyuz Microphones Launcher can give more gain to dynamic microphones and improve the resulting sound quality.

Factors we considered
The best microphone is the right one for your shooting situation. To get a better idea of how to choose the right mic, let's take a look at some key specs.

Form factor
The first thing you'll need to consider is form factor. There are several

basic types of microphones you can use in production.

Handheld microphones
Whether wired or wireless, handheld microphones are held by an interviewer or talent. They're great for getting run-and-gun interviews in noisy environments where you don't have the time for a lavalier. Handheld mics can also be used on a stand to pick-up audio from a subject who will not be moving around. Handheld mics can deliver a very rich full sound. However, if you don't want your microphone in your shot, a lav or shotgun mic would be a better option.

Lavalier
This tiny microphone clips to a lapel or shirt, or it can be completely concealed under the talents' clothing. Lav mics come in both wired and wireless forms. Lav mics can be helpful at times in blocking outside noise because of their close placement to the sound source; however, the noise created by your subject's clothing moving around while wearing a lav can make the audio captured by the microphone unusable. Lavalier mics typically don't produce as rich of a sound as handheld or shotgun mics. If it's possible, use a shotgun mic instead of or in addition to the lav.

Shotgun mic
This long, thin type of microphone mounts to a stand, boom pole or your camera rig. Shotgun mics can be placed much further away from your subject than lavs or handheld mics, while still doing a good job at rejecting outside noise. Shotgun mics are sensitive to handling noise, however, which can make using one mounted to a camera rig, or even on a boom pole, challenging.

Microphones in post-production
Microphones used for ADR or narration vary from handheld mics to large condenser mics. While many have XLR outs to connect with pro audio gear, many are now being built to connect directly to computers via USB. Foley — the background sounds in film and TV productions — is often recorded with a large variety of mics depending on many variables, including whether the recording is in a studio or outside and what the desired sound is.

Need-to-know tech specs
This is a quick and dirty breakdown. It's important to note that audio recording is an art unto itself, similar to cinematography. Many chapters of many books have been written about types of microphones, construction of mics and their pickup patterns.

Condenser vs. dynamic mics
The design of a microphone element or capsule will affect how the mic performs. There are many types of microphone elements; however, due to cost, durability and function, there are only two that should be considered for production and post: condenser and dynamic.

In the most basic sense, condenser microphones use electrical current to power a series of plates that vibrate when sound waves hit them. The obvious con to this type of microphone is that it needs power at all times in order to work. Pro audio systems use phantom power to send power down the microphone cable to condenser mics without interfering with the audio signal. Otherwise, the mic will need a battery.

Condenser mics can be very sensitive, allowing them to pick up audio from a distance. A good example of this use is shotgun microphones. This same sensitivity can result in a condenser mic picking up a lot of extra wind noise and background noise. That's why a good windscreen is also a vital accessory for your shotgun mic. It's also

Røde VideoMic NTG   *Audio-Technica AT8015*   *Samson Q9U XLR/USB*   *Soyuz Microphones Launcher*

AKG Lyra Ultra-HD Multimode USB Microphone

Whether you're podcasting, making YouTube videos, live streaming, or recording your next hit, easily do it all and sound like a pro with the AKG Lyra Ultra HD, multimode USB microphone. Inside, advanced circuitry delivers acoustically transparent, 4K-compatible, Ultra HD-grade, 24-bit/192kHz audio resolution. There's no assembly, no fiddling with software settings—it works, right out of the box. Lyra is compatible with Windows, Mac, iOS and Android devices. From recording music to live streaming on Twitch to shooting a YouTube video, using Lyra is as easy as plugging in a USB cable and pressing Go Live or Record. Lyra works seamlessly with all major audio and video production software and online platforms, and includes Ableton Live 10 Lite recording software. Learn more at www.akg.com

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important to note that condenser mics can be a bit delicate.

Dynamic microphones use an electromagnetic coil and diaphragm. While that may sound a lot more delicate than a condenser, it's not. Dynamic microphones are the most rugged mics available. They do have a limited sensitivity, which actually is not always a downside; however, dynamic microphones don't usually have as tight of a polar pattern as many condenser mics have.

Polar patterns
Polar patterns, also commonly known as pickup patterns, are the areas that a microphone will be sensitive to sound. The common polar patterns used in production recording mics are omnidirectional, cardioid, hypercardioid, supercardioid and line. Some microphones can even switch between polar patterns.

An omnidirectional mic has a polar pattern that is round in shape, while a cardioid polar pattern is heart shaped. The line polar pattern used for shotgun mics is almost completely in front of the mic and very directional. This helps explain the shotgun's rejection of noise along the sides of the mic and its popularity for use on film shoots.

Lav and handheld mics commonly use cardioid and hypercardioid patterns. They offer a good balance between wide pick up and rejection of outside noise.

Frequency response
Perhaps the most overlooked element when shopping for a new microphone is frequency response. This is a measurement of the audio frequencies a microphone is most sensitive to. This is usually expressed in Hertz (Hz). Each model will have a different frequency response, so you'll need to know how you plan to use it. For example, if you record only spoken word, you only need a microphone that has good reproduction down to around 75Hz. Most people's voices when speaking are not any lower than that. On the other hand, many audio engineers feel that accurate reproduction of up to and in excess of 15,000Hz (15kHz) is important for good intelligibility and a feeling of clarity of the spoken word.

Wireless vs. wired
As a rule, wired microphones are more reliable than wireless; wireless always runs the risk of having radio frequency interference. There are new wireless systems that help eliminate many of those interference issues, making the difference more about money. Wireless systems are typically much more expensive.

Adjusting to the situation
The right mic for the job may be using more than one microphone. For instance, say you're doing an interview on the sideline of a football game using a handheld mic. You can hear the subject holding the mic but not the crowd behind him. If you see the crowd making a lot of noise behind the subject of the interview but can't hear the crowd making noise, it's going to be rather awkward for viewers. In this case, record from a pair of microphones. You can use the built-in mic on your camera to pick up the crowd while the handheld mic picks up your subject. This gives you the ambient sound of your location without overpowering the track from your subject in your mix.

The right mic is only half the job.
Once you've determined the right mic(s) for a job, you'll need to focus on microphone placement. Sound experts have written entire books on microphone placement for recording. Taking the time to learn mic placement techniques will likely improve your audio more than better gear.

Final thoughts
Many microphones require accessories such as a windscreen, pop filter, zeppelin, shock mount or even a boom pole. Purchase them with your mic so you don't find yourself facing an overnight shipping situation. Remember also that proper placement of your new microphone can make a huge difference.

Don't settle for acceptable audio when you can have sensational sound. ⓥ

Contributors to this article include W. H. Bourne and the Videomaker Editorial Staff.

You can comment on this article by going online: www.videomaker.com/?p=295304

THE BEST
VIDEO MONITORS – 2022

We rely on our video monitors to show us an accurate representation of our images throughout the production process.

Here are some of the best video monitors currently on the market.

A video reference monitor, in some cases, is a really nice thing to add to your production kit. In fact, it might be an absolute essential.

Not all video monitors are created equal. Each will have positives and negatives, depending on your situation. So, we'll explain some of the important terms so that you can understand how to compare units and decide which features are right for you at the end of this article. But first, let's take a look at the best video monitors available today across several categories.

Best everyday monitor
BenQ 27 Inch IPS Monitor
Strengths:
• Patented Eye Care: proprietary brightness Intelligence Adaptive Technology for comfortable viewing
• Lightweight, ultra-slim bezel
• 1000:1 Contrast Ratio
Weaknesses:
• Speaker quality

For a basic desktop monitor, the BenQ GW2780 is a great pick. It fea-

tures an edge-to-edge slim bezel design with built-in speakers and a resolution of 1920 x 1080 at 60Hz. Its brightness is rated at 250 cd/m² with a 20,000,000:1 dynamic contrast

BenQ 27 Inch IPS Monitor

THE BEST **VIDEO MONITORS** — 2022

ratio. BenQ promises this IPS monitor provides TUV Flicker-free viewing and a wide 178-degree viewing angle. It also offers BenQ Eye-care and adaptive brightness. Connection options include D-Sub, HDMI, DisplayPort.

Best wide-aspect monitor
HP Z38c
STRENGTHS:
• Anti-glare coating
• 21:9 aspect ratio
WEAKNESSES:
• Not full UHD resolution tall

The HP Z38c is a monitor with a 2300mm radius curved screen incorporating a 37.5 inch In-Plane Switching Panel (IPS) with a 3840 by 1600 at 60 Hz native resolution. The Z38c offers 111 pixels per inch and a 21:9 aspect ratio. Plus, it has a brightness of 300 nit with a 1000:1 static contrast ratio. It supports up to 1.07 billion colors in 10-bit, with the use of FRC technology (8 + 2). With a 178 degree viewing angle, Z38c has 98 percent sRGB color gamut coverage and an effective anti-glare matte screen.

If you are looking for a monitor that is both impressive to look at and to use, the HP Z38c is for you. The large 21:9 aspect ratio is perfect for video editing and its 37.5 inch wide-curved screen is big without being too big. With a great price, the Z38c is sure to impress. It's a beast of a monitor and makes for a great work area for a video editor.

Best color-critical monitor
Dell U2720Q UltraSharp 27" 16:9 HDR 4K IPS Monitor
STRENGTHS:
• 99% Rec. 709
• 8 ms / 5 ms response times
• Refresh rate 60 Hz
• Contrast ratio: 1300:1
WEAKNESSES:
• Maximum brightness: 350 cd/m2
• 95% DCI-P3

The Dell U2720Q UltraSharp 27" 16:9 HDR 4K IPS Monitor delivers impressive color production and wide color gamut coverage. It features a native resolution of 3840 x 2160 with a 60 Hz refresh rate. In addition, the monitor offers coverage for 99% of the sRGB and Rec. 709 color gamuts. However, it does offer 95% of the DCI-P3 color gamut. In total, the monitor supports 1.07 billion colors and VESA DisplayHDR 400 for HDR support.

The Dell U2720Q UltraSharp 27" 16:9 HDR 4K IPS Monitor also comes with a 16:9 aspect ratio, a static contrast ratio of 1300:1 and a brightness level of 350 cd/m2. In normal mode, the monitor's response time clocks in at 8 ms. In fast mode, the monitor delivers a 5 ms response time.

What you get with the Dell U2720Q UltraSharp 27" 16:9 HDR 4K IPS Monitor is exceptional color and color depth at a fantastic 4K UHD resolution with 163 PPI. It's undeniable this monitor is ahead of the rest of the pack when it comes to color.

Best field monitor
Atomos Shinobi
STRENGTHS:
• Bright display
• Comprehensive range of monitoring assistants
• Headphone socket

The 5-inch Atomos Shinobi aims to be a great tool for vloggers and producers working on a budget who don't need recording functionality. The Shinobi sports a 5.2-inch 1000 nit anti-reflection uni-touch IPS panel allows you to see your images clearly, even in daylight. While it doesn't support HDMI out, it can receive a 4K signal and display it in full HD through the HDMI input. The Atomos Shinobi has a headphone jack to allow for audio monitoring which is a useful feature when used with cameras that don't have a built-in socket.

Additionally, the monitor shares the Atomos Ninja V's HDR 1920 x 1080 display and color processing. Included are monitoring tools for focus, framing and exposure. The Shinobi screen displays over 10 stops of dynamic range in realtime from Log/PQ/HLG signals has unique HDR monitoring features There's also support for 3D and 1D LUTs and options for anamorphic desqueeze monitoring.

Best HDR monitor
Dell Ultrasharp 32 HDR PremierColor Monitor
STRENGTHS:
• 2,000 mini-LED backlight
• Calman-powered colorimeter
WEAKNESSES:
• Lackluster refresh rate of 60Hz

This Dell Ultrasharp HDR monitor packs a punch and competes with similar monitors from Apple and ASUS for a cheaper price. This particular monitor stands out against the rest as Dell packed 2,000 mini-LEDs into the backlight. This is a great feature for editors, as it offers more dynamic contrast. This monitor also features a built-in Calman-powered colorimeter, which allows for better calibration. The HDR features on this monitor do not disappoint either.

How to shop
Your camera, environment, project and even eyesight may warrant adding another screen to your toolset. The rest of the article will help you ask the right questions so you can make the best choice possible.

Who needs to see it?
Most importantly, your first question is going to determine what type and size of monitor you'll need. Does the camera operator alone need to get a better view? Does a director or producer need to view what's being shot? Are you a colorist who will be referencing the monitor in the edit bay? ▶▶

HP Z38c

Dell U2720Q UltraSharp 27" 16:9 HDR 4K IPS Monitor

Atomos Shinobi

Dell Ultrasharp 32 HDR PremierColor Monitor

BenQ professional monitors

SW271C   PD3420Q

The BenQ SW271C is a professional 27-inch monitor that delivers color accuracy thanks to its crisp 4K resolution, AQCOLOR Technology, and 3rd-generation uniformity technology. Color consistency technology allows you to have consistent color across multi-monitor setups.

The BenQ PD3420Q is a 34-inch professional monitor for designers, video editors and content creators, delivering color accuracy with its expansive 3440 x 1440 resolution and 21:9 flat panel with AQCOLOR Technology. The PD3420Q offers an expansive view, enabling extended timelines and extra editing space. Also, the PD3420Q supports HDR10, allowing users to preview HDR content and create the best stories possible.

Learn more at: *www.benq.com*

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One viewer
If the monitor is just going to be viewed by a single person located close to the camera, a smaller camera-mounted unit would be the first choice. In short, these are generally the least expensive models and many have impressive functions. It's important to find out what type of hardware will be needed to connect it to your specific camera. Often, monitor mounts will lock into the shoe mount located on the top of the camera. If it's not being used by the operator, look for hardware that will swivel into the right position.

Many viewers
However, the more people you'll have viewing the monitor, the larger the screen size needs to be. Think about trying to watch a video on your smartphone with a crowd of people. Larger monitors, referred to as studio monitors, can be placed on a stand or even on a table. They can be located with the camera or at a distance in what's referred to as a video village, where various crew members can gather to get a view of the shot. In some cases, you will see one large

screen and a group of smaller screens labeled with each camera. If you need this type of setup, look for "loop through" connections on the monitor. This allows you to connect one monitor to another.

In the edit suite
You'll likely also want a larger screen for previewing your working in post-production, but there are almost certainly other factors, such as resolution and color accuracy, that will influence your purchasing decision more drastically in that scenario.

How will it connect?
After deciding on size and form, the next question is about the connections needed. What kind of connections does your camera or workstation have? If only a single camera needs to be connected to a single monitor, the connection question is pretty straightforward. If you need multiple cameras with different connections, things can get tricky. Can you or should you mix connection types? Would a special adaptor be used?

As with cameras, monitors have specific inputs. Most commonly, you will find HDMI or SDI inputs on field monitors. Some studio monitors and color-critical reference monitors used by colorists and other post-production specialists include inputs like HDMI, DisplayPort, DVI and now, Thunderbolt 3. Some monitors give you the ability to connect multiple inputs. You can then switch back and forth between the sources.

HDMI has different connection types, like standard and mini. Plus, there are different configurations of SDI. Depending on the resolution, you may find monitors with 12G-SDI or 3G-SDI. Make sure you have the right cables with the right connections.

Adapters are available, but image quality can be reduced at each exchange.

Ditch the wires
A relatively new feature is the wirelessly connected monitor. Some are small, like a camera mounted unit. Also, some have handles so you can view images without your fingers blocking the screen. The biggest advantage is that you don't need to be directly tethered to the camera. A small attachment is connected to the camera itself. Like all wireless devices, there is always a chance of interference and a loss of signal.

Where will it be viewed?
Next, you need to know what environment the monitor will used in. Is it for indoor out outdoor

use? Will weather be a factor? How much light is going to fall on the screen? These questions will help you determine how rugged the unit needs to be, as well as how bright the screen need to be.

In the elements
As a rule, smaller camera mounted solutions are more rugged than the studio monitors. Similarly, if you need the size of a studio screen and you're going to be outdoors, you might consider a tent to protect the device. You can get weather and shock resistant cases or consider a more rugged — and more expensive — solution.

Brightness
As far as brightness goes, manufacturers talk about lumens and nits, but those terms mean two different things. You will see video projectors compared by lumens and that is a good comparison.

In short, a lumen is the amount of light that is projected from a screen onto another surface. Generally speaking, a nit is a measurement of how much light a screen delivers to the eye. The two measurements are calculated differently. For reference, 500 nits is roughly 1713 lumens. A standard laptop screen is about 200-300 nits. This is not a measurement of screen quality, just of brightness. You want a very bright screen if it is to be viewed in direct sunlight. A screen that is considered daylight viewable will come in at around 1000 nits.

Resolution
Additionally, to better evaluate image quality, look at the pixels. The greater the number of pixels, the better the image quality. This is expressed in pixel density or pixels per inch (PPI). Another comparison is screen resolution. Ideally, you want a resolution that is the same as your camera's highest resolution, especially for post-production work. For field monitors, resolution is less important. If color reproduction is also a factor, look for monitors that coverage a wider color gamut or offer a higher bit-depth.

Panel type
The choice between LCD and OLED will also have an impact on the quality and brightness of your monitor. LCD stands for liquid crystal display, and it's the most common type of display when it comes to video monitors. LCD monitors are fine for most situations, but some shooting scenarios may call for a brighter screen or richer colors than LCD technology can offer. This is when you might look at OLED displays instead.

OLED stands for Organic Light Emitting Diode. OLED displays are considered superior in both quality and illumination. With OLED technology, each pixel is a unique light source. OLED means a brighter screen but the technology comes with a higher price tag.

Why do they need to view it?
We have the questions of form, size, connections and brightness answered. Now we need to get to the question of function. What is the purpose in having that additional screen? Is it simply so that an additional person can view the shot? Do you need any additional reference tools on the screen? How important is accurate color? Is there a need for an additional recording?

Shot assist tools
Most video production monitors come with a host of reference tools built-in. Some of the most common are frame and action safe guides. You may also find guides that cut the frame into thirds or even smaller grids. This is to help with framing things properly and to keep continuity from shot to shot.

Plus, most field monitors also offer features that allow you to zoom in on a particular area of the screen. This is great for checking focus or looking at tiny details that you might normally miss. You may also find tools like focus peaking–another way to make sure your image is in focus.

Some monitors go even deeper with tools to make sure your color is correct or the exposure is properly set. One of these tools is zebra striping. This is a helpful function that highlights areas of the shot that are overly bright with a

striping effect. Other features you may find include waveform, histogram or vectorscope monitoring tools. These help with monitoring exposure and give you much more information about your image, allowing you to make better creative choices.

Color rendition
Bit-depth, contrast ratio and HDR compatibility will also factor in if you're looking for the best and most accurate image quality — especially if your camera captures at those higher bit-depths or in an HDR format. Likewise, LUT previewing capabilities will come in handy when you're shooting in log formats. Being able to see what an image will look like once graded helps tame the impulse to continue adjusting a flat log image after exposure has been set.

Additionally, when using a reference monitor in the edit bay, color accuracy is likely to be even more important. As you shop, you'll see color accuracy expressed as the percentage of the gamuts covered or number of colors reproduced. Moreover, professional colorists may need a calibrated monitor, or one that features calibration tools.

Double duty
Finally, there are some monitors that also serve as recorders. These will often come with a higher price tag, but can greatly expand the capabilities of your camera.

Making the choice
Answering the above questions will help you navigate through the selection process. While you shop, consider where and how the monitor will be used, why you need one and what extra tools will come in handy on set or in the edit suite. Armed with that knowledge, you'll be ready to find the perfect monitor to add to your production toolkit. **V**

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WHAT IS MISE-EN-SCÈNE?

AN ESSENTIAL FILMMAKING CONCEPT

BY KYLE CASSIDY

What is mise-en-scène? That's probably the question that brought you to this article. Mise-en-scène is a term often left undefined. However, it deserves explaining because it is an essential part of a film director's work. It is, in fact, the culmination of all of a filmmaker's tools, skills and experiences used together to tell a story wrapped in a sense of atmosphere.

Possibly the vaguest definition of anything ever comes from Supreme Court Justice Potter Stewart in his opinion on the case of "Jacobellis v Ohio." He was unable to define what would make a movie obscene and thus not protected under the First Amendment. He wrote: "I know it when I see it." This shoulder-shrugging definition has kept lawyers and artists pushing the limits. Nobody has known the exact dimensions of obscenity for nearly 50 years.

Mise-en-scène is similarly undefined. Only a few years later, film studies professor Brian Henderson said in his essay, "The Long Take," that mise-en-scène is "cinema's grand undefined term." He begins by listing directors who are masters at it. He included masters like Murnau and Orson Welles. However, he went on to write "one does not lightly venture a definition of mise-en-scène… of which each person, when examined, reveals a different sense and meaning…"

Mise-en-scène definition

Literally translated, mise-en-scène means "placing on stage." It includes the things that movies have in common with plays. That means props, lighting, wardrobe, blocking and the number of layers in the scene (foreground, middle ground and background). Probably a better translation for it is "everything that's part of your shot", or "everything in the frame." It is, in essence, the miasma of everything that makes your film beautiful and unique. It's what sets the mood and brings your ideas across.

Mise-en-scène also includes a few things that stage plays don't really have. For instance, movies have move-

able cameras to represent the otherwise fixed audience of a play. That is to say the aspect ratio of the frame, the camera angles, focus, lens focal length and any color treatments to the film or video. You may notice while watching "Game of Thrones" on HBO that everything at Castle Black looks very blue. That includes the snow and the people.

This is part of the mise-en-scène and it was a conscious decision on the part of the showrunners, the directors, the cinematographers, the color graders, the set designers and others who got together, long before a frame was shot, and made decisions about how the final piece would look.

Mise-en-scène and the long take

However, also like a play, critic Brian Henderson adds that mise-en-scène "requires the duration of the long take." Once you add a cut, you've jangled the mise-en-scène; reshuffled the deck. Henderson wants things to be given time. He's a fan of 10-minute continuous shots.

You can have a lot of things in the frame and have them be jarring, or uninteresting or outright hostile to the viewer. This is still mise-en-scène; it's just bad mise-en-scène. That is, unless it's done for a very specific reason — there are indeed times you may want your audience to be uncomfortable or to think something is ugly. You can think of mise-en-scène as design for

the screen — arranging everything in the frame in a manner that's both pleasing to the eye and useful for telling the story.

Building blocks of mise-en-scène

The elements that make up your frame, and therefore your mise-en-scène are:
• Setting
• Lighting
• Props
• Actors, including their makeup, costumes and hairstyles
And lately, color grading, which is becoming a more important part of film and video productions

Your mise-en-scène is built from each of these elements. Everything you put into a frame should be working towards creating one that's cohesive, distinctive and spectacular.

Stanley Kubrick was a master of beautiful mise-en-scène and he loved long takes. One place where this is particularly apparent is the penultimate scene in "2001: A Space Odyssey." In this scene, astronaut Dave Bowman lives out his life in a mysterious glowing room, watched over by the monolith. The furniture, the colors, the light, the placement of objects, the symmetry and the asymmetry are all done to create a particular beauty. Replace one chair with a yard sale discovery and the whole frame is hit with a hammer and knocked askew.

Mise-en-scène is everywhere

Do some videos have this and others not? Oscar Wilde, in "The Picture of Dorian Gray" said, "There is no such thing as a moral or an immoral book. Books are well written, or badly written. That is all." Mise-en-scène is like this; all movies have it, but in some, it's very good, and in others, it's not very good. Sometimes this matters, and sometimes it doesn't.

For example, a great deal of thought went into the mise-en-scène that makes up Lawrence of Arabia. Camera angles, placement of actors and props were very carefully considered in each frame by director David Lean, cinematographer Freddie Young and a host of other people, including costumers and stylists.

Contrast this with a corporate fire safety video whose only duty is to inform office workers of how to properly evacuate a building in case of an emergency and to cost less than $400 to produce. In this case, the videographer may be considering some aspects of lighting and camera placement but most likely won't trade a static shot for a dolly shot simply because the dolly shot is more attractive.

Mise-en-scène is part of your personal style

Mise-en-scène represents your overarching goal as a filmmaker — your style, your personal artistry. It wraps up many of the elements of video production that you've already learned about, from composition to focal length to the use of negative space. The way in which you put these things together will create your own particular mise-en-scène.

Many directors and cinematographers have a very specific mise-en-scène that telegraphs their presence. You can look at a movie by Michael Bay, Quentin Tarantino or Guillermo del Toro and know who directed it.

When does mise-en-scène begin?

Mise-en-scène begins long before you get to the set. It starts with your concept. When a producer says, "This film is a gritty New York police drama about a detective whose underworld past has caught up with

her," that's already setting a scene. Using this description, you'll start to find actors, sets and lighting to bring that out. Likewise, if your client tells you, "This film is a police procedural about a single father whose insistence on a meticulously ordered and fastidious life involves the careful balances of daycare and by-the-book crime solving," you'll probably start thinking of different actors, lighting and camera work.

In each of these examples, you may start to think of ways to use the balance or imbalance of objects in a frame to show order or disorder, a color palette that shows things in control or things out of control, brightly lit scenes vs. starkly lit scenes. Things that take place in the daytime vs. things that take place in the night. One character's hair may be meticulous while the others may be unkempt, one wardrobe well cared for and the other disheveled. All of these things will work together to tell your story before your characters speak a line of dialogue.

Planning for good mise-en-scène

Knowing that things exist and being able to name and describe them goes a long way towards reducing the amount of searching you need to do for the right final product.

In some films, the mise-en-scène is so thick and so pre-planned that the

Behind the scenes shot of Lawrence of Arabia showing stylist touching up Peter O'Toole.

actors often find themselves to be tiny props in a much grander vision think epic science fiction films or blockbuster superhero movies. In some of these instances, everything in the frame that is something that's been created specifically for the purpose of that frame. But that doesn't mean that no work goes into more realistic films — it's just more subtle.

A production designer may spend an enormous amount of time and effort finding the exact refrigerator to place in a character's kitchen to help tell their story. Even the contents of that refrigerator may be carefully chosen to push the narrative forward. Is the character health conscious? Are

they a neat freak? An alcoholic? All these subtle clues are part of the mise-en-scène, just as much as a gigantic, Earth-destroying robot, towering over Manhattan, or the snow globe in "Citizen Kane" (1941).

Case study: "Gunpowder Milkshake"

Let's take a look at Isralie director Navot Papushado's heavily stylized gangster movie "Gunpowder Milkshake" (2021), starring Karen Gillan, Lena Headey, Carla Gugino, Michelle Yeoh and Angela Basset. Lensed by Michael Seresin with production design by David Scheunemann and set decoration by Mark Rosinski, "Gun-

Scene from "Game of Thrones" at Castle Black with bluish color grade. Production designer Gemma Jackson won an Emmy for her work and inspired a lot of cable TV shows that desperately wanted to be the next audience-grabbing series.

The clean lines, clean spaces and overhead lighting tubes in parts of Gunpowder Milkshake pay a strong tribute to Stanley Kubrik's 1968 epic film 2001: A Space Odyssey.

powder Milkshake" is an action movie that pays tribute to many, many other films — which is to say, it has a very specific mise-en-scène.

How does this come about?
"Everything is in service to the story," says director Navot Papushado, "once I realized that this is an assassin movie that's based on ronin's or lone samurai from Kurisawa or the hired assassins of Hitchcock, once you understand that, that's where this kind of genre-blender is born. It's almost a study of who you are as a filmmaker because you write something and then you realize, 'Oh, wait a minute, I was influenced by this and this and that.' And when you come to break down a scene, you relive those influences once again."

"There are a lot of nods to Kubrick, especially in the clinic fight scenes, which we wanted to make very sterile and bright and clean, so it's like '2001,' but it's also like 'Roger Rabbit.' I think that's from growing up in the 1980's, it's the natural evolution of being influenced by all those great flicks. You grow and progress as a person and a filmmaker, but these pillars of cinema are always in the back of your head."

Starting at the beginning
Navot says that all this pre-planning about how things are going to look happens, for him, very early on.

"The first person you start to work with is your production designer. The first thing we did was come up with a color map deciding what each color is going to mean. One group is going to be all blue and grey, the other group will be all browns, yellow is going to mean death, so there's a yellow bag that says "I love kittens" on it, and it's full of guns, and the body bags are yellow. And orange is going to mean change, evolution, so 35 minutes into the movie our heroin, who has been dressed in very dark colors, puts on an orange jacket because she's starting to make decisions that go against her character.'"

Navot and his production team also made sure that the props fit each of the characters. They discussed textures, fabrics and weapons and then sent the various department heads to start to bring things together. Some of the script changed when actors were cast, but other things remained exactly as written in the original script.

Color and storytelling
"Gunpowder Milkshake" successfully uses lighting, colors and framing to create a very specific world, a world in which colors tell us who belongs and who is an intruder. People who belong in a scene fit in as though they were camouflaged and those who don't stand in stark contrast. The world itself, even in its grittiest places, is immaculately clean — parking garages, there are no objects that don't serve to advance the the story and remind us that it takes place in a world not quite here, where the rules are different. Strung somewhere halfway between fantasy and reality "Gunpowder Milkshake" is able to take leaps that would require explanation in a different setting.

The language of mise-en-scène
We see that mise-en-scène can be borrowed, it can be referenced and it can be paid tribute to. Mise-en-scène can also serve to bring multiple films together stylistically.

Take Ridley Scott's 1979 masterpiece of outer space terror "Alien." The film takes place in the lower decks of a grimy spaceship called the Nostromo, itself a nod to the 1904 novel by Joseph Conrad. Everything in this spaceship screams "working class" — from the relaxed uniforms to the clutter, grime and dark lighting. This is a spaceship that exists on low margins in an unglamorous world perfect for hiding a people-eating alien.

This franchise has spun off a number of related films, like the action-packed 1986 sequel "Aliens," and others, some of which take place in the distant past — our present — on Earth. How do you make Earth in 2007 look like a spaceship in 2134 or a space colony in 2191?

Scott's original spaceship was inspired by the drawings of H.R. Geiger which place tubes everywhere. That's how we get the familiar territory of the Nostromo. To reflect this, Directors Greg and Colin Strause take us into a spooky water-filled sewer whose wall-mounted pipes are a strong tribute to the sewer in James Cameron's 1986 follow up "Aliens."

In each of these instances the mise-en-scène evokes a dark and complicated space where scary things can hide. However, in the latter two, the directors are using familiar objects to keep the films in a universe that the audience feels like they know.

Karen Gillan puts on an orange jacket and begins her metamorphosis. Gunpowder Milkshake, 2021. Directed by Navot Papushado.

One of the gangs, dressed in dark browns and Earth tones. The arrangement of the actors is extremely particular and shows the very ordered nature of this group of thugs. Gunpowder Milkshake, 2021. Directed by Navot Papushado.

Michelle Yeoh takes on a room filled with bad guys. Director Navot Papushado's carefully chosen color palette gives a very stylized look to the film and allows viewers to easily place people who belong in a scene and intruders. Gunpowder Milkshake, 2021. Directed by Navot Papushado.

The corridors of the space tug Nostromo. Alien, 1977. Directed by Ridley Scott.

Underneath the colony. Aliens, 1986. Directed by James Cameron.

A sewer on contemporary earth. Alien vs. Predator: Requiem, 2007. Directed by Colin and Greg Strause.

Homework assignment
Your homework is to pay attention to the way all of these elements come together in movies and television you watch. Pick out scenes that speak to you. Watch them several times so that you can deconstruct each of the elements. You need to understand what they add to the final piece and how they work in concert with one another. Are there things you would do differently? Also, pay attention the next time you're setting up a shot. What are you including, where are you including it and why? How does it help propel your story along? 🎬

Kyle Cassidy is a professional filmmaker, photographer and writer.

You can comment on this article by going online: www.videomaker.com/?p=18234

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by Landon Dyksterhouse

What is a screenplay?

Screenplays are essential to movie-making. They are also necessary for those who want to get their ideas made into films.

If there is one thing that you should take away from this article about writing a screenplay, it's this quote by Aaron Sorkin, the legendary screenwriter for films such as "The Social Network," "Steve Jobs" and "A Few Good Men":

"Without a strong, clear intention and a formidable obstacle, you don't have drama."

What this means is: You need to have a solid foundation of intention and obstacles to create a compelling screenplay. Once those elements are squared away, you can effectively exercise your voice and put pen to pad to write your screenplay.

Screenplay defined
A screenplay is the script of a movie or a TV show or visual media that includes dialogue spoken by characters and a shot-by-shot outline of the film's action. Essentially, it's a written version of the movie. It sets out to engage and move readers just like a film and give direction to those making the film.

Why are screenplays important?
Your screenplay will be your communication tool for the story you want to bring into real life via a feature film, TV show or some other form of moving media. Also, it will be the central determinant of what the narrative will be. There is nothing more central to the process than the screenplay.

Components of a screenplay
The four basic components of a screenplay are images, action, sound and dialogue. If we want to take it a step further, the five foundational elements of a screenplay are character, want and need, plot, structure, conflict and resolution. All these elements are vital to creating a successful narrative arc and story.

Theme
The theme is the overall message of your screenplay and how it impacts your audience. It's the message your audience will take home. Often, a good screenplay will have a memorable, timeless theme that will live in people's minds long after watching the film or reading the script.

A good rule of thumb: The more authentic the theme is, the more likely the screenplay will succeed at what it's trying to accomplish. The screenplay and theme have to connect in a meaningful, genuine way; it's the only way to elicit an emotional reaction. If you can do that, you will have a powerful screenplay on your hands. One thing you can do to ensure the approach you're taking is authentic is to question why you're writing your screenplay. Ask yourself if it's worthwhile dedicating weeks, if not months or years, of your life to writing about your chosen topic. If the answer is anything other than "yes," you either should approach the topic from a different angle or consider another topic.

Coming up with a viable story idea is critical to all forms of writing, and it rings especially true for screenplay writing. It's just as important as knowing how to write a screenplay.

Originality is key
Originality is very important in screenplay writing. It helps provide screenplays with a unique perspective to build up their authenticity. However, screenplay writers always have to walk a fine line between authenticity and originality. When you deviate too far from what people expect, your screenplay runs the risk of being unrelatable. Finding a balance between original voice and authenticity is the key to making a memorable script.

An example of this idea is the film "Napoleon Dynamite" (2004). The screenplay tells the story of an awkward teen trying to fit in with his high school peers. Though this type of story has been told countless times, "Napolean Dynamite" is written in a unique, fresh way that puts a new spin on the tale. A lot of the script's unique ideas came from one of the writers, Jared Hess, own experiences growing up in Preston, Idaho.

You don't have to reinvent the wheel, but bringing something fresh to your audience while still making it relatable should be the focus of your screenplay.

Pacing
In every scene of your screenplay, there needs to be the respiration process: an inhalation and exhalation that creates a rhythm and pace to the story. In many screenwriting books, this idea is called the call and response method. Essentially, this means that one scene's actions will directly affect the following scene's reaction. In turn, this leads to tension building that eventually leads up to the story's conflict.

Rewrites are key
First drafts are hardly ever producer-ready. It will likely take a few rewrites to get your script to the standard you want it to be in. Going back to the screenplay to include new facts

> ... SCREENPLAY WRITERS ALWAYS HAVE TO WALK A FINE LINE BETWEEN AUTHENTICITY AND ORIGINALITY.

and add characters to bring the scene to life is part of the writing process. The screenplay will undergo constant evaluation, rewriting and reconstructing scenes to make the narrative work. The words aren't written in stone until you paste your screenplay parts together to create a cohesive narrative. You may even have to go back and take some of your characters out or trim some of your scenes. This may sharpen your script's narrative arc. Remember: less is more.

The goal is to take the writing beyond the didactic. The goal is to deliver it as a poetic vehicle that elevates it from the expository.

Selling your screenplay
The ultimate goal of most screenwriters is to sell their screenplay. If you can sell your screenplay or script, a good rule of thumb is to value your screenplay at 10 to 15 percent of the production's budget.

"Napoleon Dynamite" (2004) puts a unique spin on the classic story of an awkward teenager trying to fit in with his high school peers, taking much inspiration from one of its writer's experiences growing up.

Depending on the production, you can get a few thousand dollars or several tens of thousands of dollars. It all depends on the scope of the project, who's involved, the access and perspective on the story as well as licensing and rights negotiations.

One thing a production may do is put an option on your screenplay to borrow the rights to the story. This allows them to pitch it to other companies to see if it can get the screenplay adapted into a feature film. In this case, you would get a payout if a production picks up the option.

Now, if a company options your script, it doesn't mean a production will pick it up. All it means is that the company optioning it has the right to shop around and see if there's an offer for it. However, optioning could very well lead to a company paying for full rights to the screenplay. Also, if the screenplay doesn't get picked up, the company optioning it won't lose money, aside from the option fee paid to the screenwriter.

Making it as a screenplay writer
It's important for you as a screenwriter to understand the current trends of the market and what the Hollywood system needs and wants. If you play the game right, you can make a lucrative career out of being a screenwriter. ▶

Landon Dyksterhouse is an award-winning documentary filmmaker and is the founder of D-House Entertainment.

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by Odin Lindblom

What is color space?

Knowing common color spaces and how to use them in your projects will grant you greater control over your images.

Color space is one of the more mysterious aspects of video production, which is ironic given how ubiquitous its usage is. It affects the image of every video project you work on. Every digital video and still image utilizes a color space. Getting up to speed with common color spaces and how to best use them for your projects can have many advantages. This includes getting greater control over your images, helping to prevent issues when you change color spaces and even preventing changes in color space altogether.

What is color space?

A color space is not ideas about colors and their attributes; that's color theory. It's also not that spot at the home improvement store with all the cardboard color samples. Color spaces are just fancy systems that assign numeric values to colors. By doing this, the colors can be graphed and utilized more easily. Don't worry about the numbers; this is a math-free article!

While early color spaces were predominately used for scientific research, the development of new image reproduction technologies came with the need for new color spaces to support them. The color spaces that are of greatest interest to us are those developed for digital still images, television and feature film.

Common types and their usages

Below is a list of the color spaces you are most likely to run across in your workflows.

• **Rec. 609 (ITU-R BT.709)**: This digital standard includes the color spaces for the analog NTSC, PAL and SECAM SDTV formats.
• **Rec.709 (ITU-R BT.709)**: the color space for HDTV.
• **Rec. 2020 (ITU-R BT.2020)**: the color space for UHDTV (4K TV).
• **ACES**: This system is based on CIE XYX for digital cinema production, post-production and archiving.
• **DCI-P3**: While technically not a color space, it's a required area of coverage of the XYZ color space for digital cinema projectors; it has become a post-production standard because it's what theater projection systems can reliably reproduce.
• **sRGB**: This is used for the World Wide Web. It's sometimes used for still cameras, video cameras, monitors and scanners.
Adobe RGB: This color space was developed for CYMK printing workflow on computers and is often used for monitors.

• **CIE 1931 RGB and CIE 1931 XYZ**: Developed in 1931 to represent the range of human visual perception, they're often used to compare other color spaces on an XY graph.
• **YCbCr, Y'CbCr, or Y Pb/Cb Pr/Cr (also written as YCBCR or Y'CBCR)**: This was commonly used for component analog video.

Ok, why should I care?

Having an increased understanding of how color spaces affect your images can help them come out better. By avoiding color space conversions and understanding how they affect your images, you'll be able to work faster. Faster post-production means more time to do other things and less mileage on your computer.

Planning your workflow

As you go through pre-production, you'll want to include color spaces in your plans. Think about how it might impact the way you shoot, edit and deliver your projects.

Shooting in the same format and the same color space quickens your editing and rendering, which can re-ally speed up your turnaround time. If you're shooting a short web video that you want to upload in HD, most modern cameras will record in Rec. 709 color space if you choose HD or AVCHD as the format. Likewise, in your post-production software, choosing a similar format preset will keep you in Rec. 709 for editing and rendering out. In most software, you can view the preset details in a window to ensure you're in the right color space. A quick web search with the preset name and software name can often find that information as well.

If you're shooting in a RAW format, changing color spaces is unavoidable. However, if you take a sample of your RAW footage into your post-production software, you can see what it looks like and know how long transcoding will take. If you are renting your production camera, you can often find short sample RAW camera files available online for download. Similarly, your camera rental house may offer a camera test before your rental.

When working on a documentary or other project where you may need to bring in a lot of archive images and footage, you should take some time to decide what workflow will make the most sense for your production. This is where testing footage in editing and rendering can really save you time and frustration.

Delivery requirements

Ultimately, how you structure your projects should depend on your footage and delivery requirements. If you're only using archive materials for your video tracks, converting the footage to the same color space as your delivery format makes the most sense. Since sRGB, Adobe RGB, Rec. 601, Rec. 709 and Rec. 2020 all have the same white point (D65), conversion between these usually doesn't cause major color shifts.

You can scan images in sRGB or Adobe RGB, bring in old footage in Rec. 601, shoot new coverage in Rec. 2020 and edit in Rec. 709. You may see a slight increase in saturation, but not much more than if you shot and cut in the same color space. If you're shooting RAW and delivering in Rec. 2020, doing post-production in Rec. 2020 will probably make the most sense.

ACES advantages

A few years back, The Academy of Motion Picture Arts and Sciences teamed up with the American Society of Cinematographers (ASC) to develop the Academy Color Encoding System (ACES). The ACES workflow provides tools to add consistency to color, give natural color look options and provide a unified archiving format. ACES has become the gold standard workflow for feature film,

> A COLOR SPACE IS NOT IDEAS ABOUT COLORS AND THEIR ATTRIBUTES; THAT'S COLOR THEORY.

television, commercials and VR. The best part about ACES is that you don't need a Hollywood budget to take advantage of this. There's a good chance the editing software you're already using has ACES tools ready to go.

If you're disappointed by the reds in your Rec. 709 footage, there's an ACES editing effect that changes the linear color curve to a serpentine color curve which produces more natural-looking colors. There's also an effect that allows you to view RAW footage without it looking washed out or dull. This doesn't limit the range of color when it's time for correction; it's just a preview. The majority of these tools work on any footage and don't have any extra cost.

In the dark ages of video (1960s – 1980s), dozens of video formats were created that were incompatible with each other. As a result, thousands of hours of video production footage were lost. This even includes many American and English network TV shows because there were no tape

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Common color spaces and their usages

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drives for footage playback. Digital formats are also not immune to this type of catastrophe if the decoding software is lost. Hollywood is now digitally archiving with the ACES image format. It's free and open-source and ensures your work will be viewable for decades to come.

Color space and event video
Video switchers, processors and projectors often support multiple format inputs with different color spaces even on the same connector (HDMI, analog, etc.). These inputs are often manually configurable to different color spaces. If the colors on your screen don't look right, make sure the color space selected is the same one you're sending to the device.

Cinema projection
Filmmakers often worry that creating a Digital Cinema Package (DCP) for film festival screenings will cost big bucks, even though there are free tools to create DCPs. Many festivals don't even require DCPs because the projection system supports hardware conversion from Rec. 709 to the projector's native XYZ color space.

I can tell you from my own experience having produced a film in 4K in Rec. 709 that played at over 40 festivals, my crew and I saw the color space conversion and thought it looked great. The conversion was also very, very close to what I had seen on my inexpensive but calibrated monitors that I had used in post-production.

The horror of CYMK
CYMK color is meant for printed media and can be literally impossible to match in a video color space. If you're attempting to match a printed color that was produced in CYMK, try and shoot in a RAW format. However, if you can't, use as large a color space and as little compression as possible.

If you have to display something like a company logo on a screen that will also be on CYMK printed signage in the same location, try and ensure that the two are as far apart as possible so that color variations aren't as noticeable.

Hardware wars
There are a lot of monitors that are advertised with phrases like "98% coverage of Adobe RGB", but it's doubtful you'll have video in that color space.

So, how does this relate? Well, Adobe RGB is slightly smaller than Rec. 2020, so it would cover most of that color space. Keep in mind that coverage of a color space isn't the same as accuracy of color reproduction.

Cameras, recorders and capture hardware often have multiple color spaces that they can record in. These devices usually follow format standards: SD will record in Rec. 601, HD in Rec. 709, etc. However, some devices only record in Rec. 709. While it usually isn't an issue if you have to convert footage, the range of colors captured may be affected. Rec. 601 to Rec. 709 to Rec. 2020 all have steadily increasing color ranges. Remember, a wider color range is more beneficial for color correcting.

Always come with a plan
With proper planning, working with different color spaces can be a breeze. It can really help you get the most out of your projects. **V**

Odin Lindblom is a director, cinematographer and award-winning editor whose work includes film, commercials and corporate video.

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by Erin Vierra

Screenplay vs. script

There's a common misunderstanding regarding the topic of screenplay versus script. While these two terms may seem the same, they aren't.

It is a fundamental truth that words are the building blocks of communication. Words are essential, like breathing, and without these building blocks, the world would be chaotic. For writers and filmmakers, words are indispensable when telling stories because they move their narratives forward. No matter which medium you use to express yourself, words are needed at some point in the process.

In English, we sometimes lose the distinction between two similar words, especially when it comes to media. Let's look at two terms that get used interchangeably: screenplay and script. While those two terms may appear to describe the same thing, in the media world, there is a difference.

So what do they mean, and what differentiates the two? Let's break it down.

Screenplay vs. script

In a nutshell, a screenplay connects to film and television only. It's considered a visual outline of what a production's bringing to life on the screen. On the other hand, a script is a generic, broad term that you can use in various contexts. Sometimes, its usage doesn't even fall into the visual medium.

However, production teams may use both "script" and "screenplay" during production. They both have their place in the video industry. However, there are still differences. A script is the initial outline of a production. It includes things like dialogue

and actions, but it may not include foundational information needed for production. A screenplay is the finalized outline of the project, essentially being a step above a script. It consists of a thoroughly-developed narrative structure and visual directions to help the crew set up for shooting.

Screenplay vs. script: What is a screenplay?

When most people hear the word "screenplay," they may instinctively think of the big screen, and they would be right. Though, that doesn't cover the whole picture. Screenplay, or teleplay, refers to any written script intended for movies and television, the small, silver screen.

Think of a screenplay as a novel. It is the writer's purpose and job to be as descriptive as possible to bring characters alive and create an elaborate world through the power of words. A screenplay is a canvas to do just that. It lays out a descriptive narrative of a film or TV and allows the reader to visualize what is happening on screen.

In the sample screenplay (figure 1.), we can see it follows a specific structure and language. For instance, character tags provide headings for dialogue. Scenes are broken up by scene

headings and subheadings. There are also elements like parentheticals to clarify tone and transitions, which instruct editors on transitioning into the next scene. Ultimately, screenplays are a defined outline of what technically needs to happen during production and post-production.

Why is it important?

So, what are screenplays used for, and why are they helpful to productions? For starters, a screenplay acts as a blueprint, outlining scenes, character interactions, dialogue and actions. Ultimately, it provides a narrative outline containing descriptive elements in telling and shooting a story. Screenplays detail what is shown on the screen, from auditory to visuals to behavioral to lingual. Thanks to the screenplay, the director, actors and the rest of the crew have a starting point, allowing them to drive up new ideas but keep the narrative grounded with the original production's intent.

When it comes down to it, most films wouldn't be possible without screenplays — at least not with the quality we expect them to have. Without a script, it's easy for productions to overlook details and for the narrative to derail. For instance, Actors

need a script. Otherwise, they would have to improvise their lines, likely changing the narrative.

Screenplay vs. script: What is a script?

If a screenplay is a written document that describes a visual story meant for the screen, then a script can be a written document meant for anything regardless of the medium. The word "script" comes from the Latin word meaning "to write." A script can be for anything and is subject to changes, modifications and additions before being finalized. Unlike screenplays, scripts aren't limited to film and TV production.

Essentially, scripts refer to any written document of a visual art form used across various mediums, including stage plays, podcasts, video games and radio programs. Regarding video creators, scripts can also be used as part of a YouTube channel and for other video content creators on platforms such as TikTok and Twitch.

Why is a script important?

The special thing about a script is that anyone can take advantage of it and use it for their specific platform. You can think of a script as a basic outline. For example, if someone's creating a podcast, they should have a basic script to help them bring up topics they want to talk about during the recording.

Content creators may find that having a script can be helpful in the process of creating videos as well. No matter what kind of content you choose to make, whether it's comedy skits or talking head videos, scripts help you know what you're trying to achieve with the video. Additionally, the script acts as a safety net in the creative process since it's always there if you need to fall back on it.

Scripts can even cross into the realm of video games. With so many current video games pushing the boundaries of their narratives, scripts are necessary. For example, the 2013 video game "The Last of Us" tells the story of Joel. Joel,
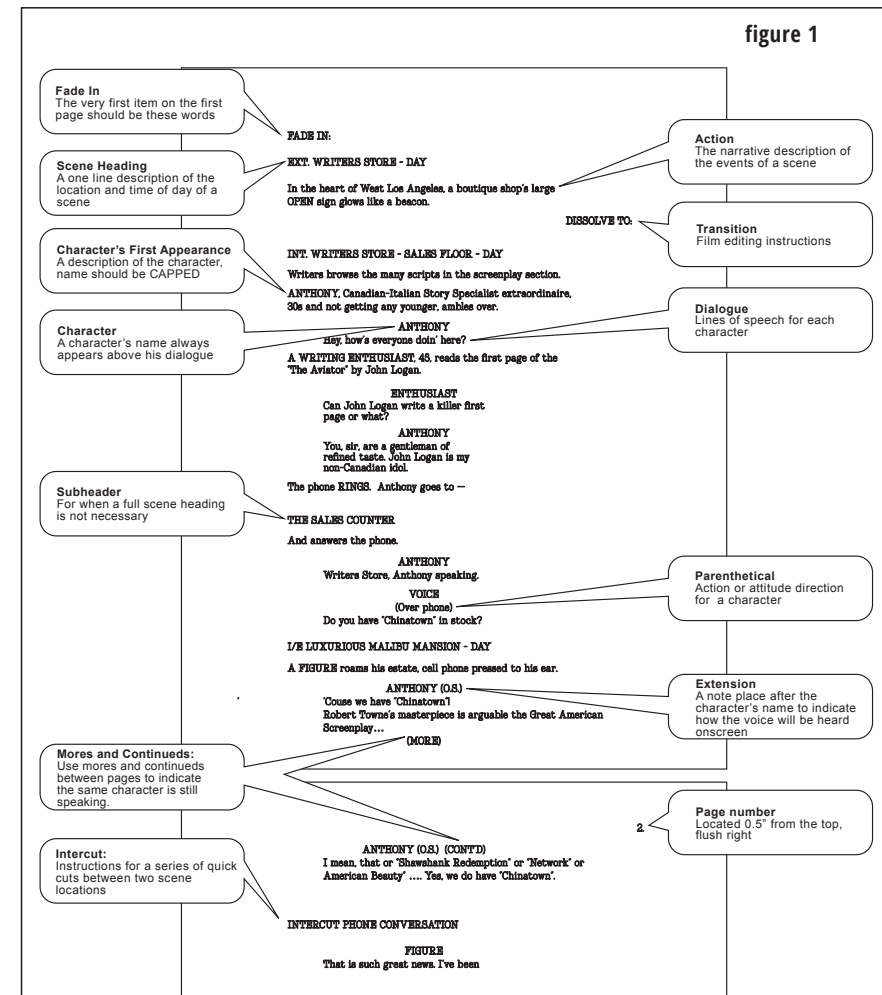
a smuggler, is tasked with escorting a teenage girl to safety in the middle of a post-apocalyptic United States. This video game has a script that it follows, and it provides developers an outline, including a basic setting and dialogue to help them build a visual world around it. A script in this format doesn't go into depth like a screenplay, but it gives just enough to play out in its chosen medium.

Script vs. screenplay: the same, yet different

Therein lies the difference between a script and a screenplay. A script can look like a screenplay, with settings, descriptive backstories and characters, but it can also just be a basic outline full of talking points. No matter what

medium one chooses to use it for, a script is a valuable asset and gives stability to the creative process. In other words, not all scripts are considered screenplays, but all screenplays come from scripts.

Screenplays are vital to every production in cinema and television production. If you want an even deeper deep dive into screenplays, be sure to check out our article on screenplays. We also have seven editing tips that will take your screenplay from good to great. **V**

Erin Vierra is a freelance writer and a music news editor for mxdwn.

figure 1

Fade In — The very first item on the first page should be these words

Scene Heading — A one line description of the location and time of day of a scene

Character's First Appearance — A description of the character, name should be CAPPED

Character — A character's name always appears above his dialogue

Subheader — For when a full scene heading is not necessary

Mores and Continueds: Use mores and continueds between pages to indicate the same character is still speaking.

Intercut: Instructions for a series of quick cuts between two scene locations

Action — The narrative description of the events of a scene

Transition — Film editing instructions

Dialogue — Lines of speech for each character

Parenthetical — Action or attitude direction for a character

Extension — A note place after the character's name to indicate how the voice will be heard onscreen

Page number — Located 0.5" from the top, flush right

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by Jeff Chaves

4 best budget camcorders in 2022

While there are a lot of great cameras on the market, sometimes a budget camcorder is all you need to capture great video.

Image courtesy: Sony

When we say best budget camcorder, you might think of something low-quality or feature-lacking. However, that's not always the case. In reality, it's possible to get your hands on a good camcorder for less than you would expect. Many new, low-cost camcorders have features once reserved for high-end models.

Of course, "budget-friendly" will have a different meaning depending on who you ask. A content creator will have a different idea of what makes a camcorder budget-friendly than an indie filmmaker or a news station.

In this guide, we've come up with various budget camcorders to meet many different videographers' definitions of budget-friendly. Every camcorder included in this list can shoot 4K and costs less than $1600. The majority of them cost under $1000. In addition, we'll give you a few cost costing tips so that you can keep your budget in check.

Budget 4K camcorders
When faced between a budget camera or camcorder, there are situations where a camcorder will be the better. While many camcorders don't have interchangeable lenses, they typically offer nice zooming capabilities. They also work well in run-and-gun shooting conditions or overseas travel shoots.

We picked two great camcorders that deliver excellent image quality at a reasonable price.

Panasonic HC-VX981K 4K Ultra HD
Panasonic offers one of the lowest-priced 4K camcorders on the market. The Panasonic HC-VX981K features a 20x Leica Dicomar Optical Zoom lens in front of a 1/2.3-inch BSI MOS sensor. It also takes advantage of a 60x digital zoom in 4K and a 1500x digital zoom in HD. Additional features include digital and optical stabilization

and the ability for some cropping and editing right on its touchscreen. This unit does not have an audio input but does feature a unique, wireless multi-cam feature.

Sony FDR-AX43 UHD 4K
The Sony FDR-AX43 is one of Sony's best low-price 4K camcorders. The camcorder has a 26.8 mm Zeiss Vario-Sonnar T Zoom Len and a 1/2.5-inch Exmor R low-light CMOS sensor. It also features optical stabilization and Sony's Fast Intelligent AF with tracking functionality.

Unfortunately, the Sony FDR-AX43 doesn't feature an audio input, but it does have a 5.1 Channel Surround Sound microphone. Though, it can't

record Surround Sound while the camcorder is in 4K mode.

Low-budget, professional camcorders
A step above the budget consumer-level camcorders and cameras, we have the pro-level camcorders. These camcorders generally give you more image control and better choices for inputs and outputs. Of course, those features come at a price. The units we've selected don't have interchangeable lenses. Typically, camcorders with interchangeable lenses support sell at a higher price. Additionally, while a camcorder body might be low-cost, you also have to factor in the cost of the lenses you want to use. Lenses can get expensive — in some cases, double or triple the price of the camcorder's body.

However, our picks here are stuck with one built-in lens.

JVC GY-HM170UA 4KCAM
Immediately you'll notice that this JVC camcorder is not your dad's camcorder. The JVC GY-HM170UA has a top handle with dual XLR plus and lots of audio control. The camcorder has a 1/2.33-inch CMOS sensor and a built-in neutral density filter. It also has a full-size HDMI output to connect it with a switcher, monitor or recording device. It also features an external single button white balance switch and classic zoom rocker.

Canon XC10 4K Camcorder
The Canon XC10 looks like a mirrorless or DSLR body, but there is no interchangeable lens. This camcorder features the largest sensor of this group, sporting a 1-inch CMOS sensor. It does have a flip-out, 3-inch touchscreen and comes with a unique viewfinder loupe. Additionally, it has a 3.5 mm audio input jack. Plus, it features both an SD card slot and a CF card slot, which is quite unique.

Rent or buy refurbished?
When you start building your budget for your project, several consider-

Panasonic HC-VX981K 4K Ultra HD

Sony FDR-AX43 UHD 4K

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full screen
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JVC GY-HM170UA 4KCAM

Canon XC10 4K Camcorder

ations can help you lower the overall cost of your equipment.

Renting

You might consider renting a camcorder instead of buying a new one. Renting can slash production costs if you have a clear blocked-out schedule.

Renting cameras and camcorders is certainly a budget-friendly option, especially if you only need the camcorder for this specific project. There's no need to purchase a new camcorder if you're only planning to use it for a few weeks. However, before renting a camcorder, there are a few things you have to consider. First, you have to locate a rental facility. You can check to see if there are any local rental facilities near you with the camcorder you need. If not, there are plenty of online rental stores you can use. One popular choice for many video producers is Lens Rentals. It's a highly reputable company that rents professional camcorder gear from all major brands.

While renting can be a great option for budget filmmakers, be sure to double-check renting costs. You might discover that renting your particular camcorder isn't as budget-friendly as you think. The rent cost can add up if you need the camcorder for an extended period. Additionally, you have to manage your time wisely with the camcorder. Since you don't own the camcorder, you can't go back and reshoot unless you're ready to pay again.

Buying refurbished

Another option you can consider is buying a refurbished camcorder. While not as cost-effective as renting for a few days, you still can own the camcorder for much less than the sticker price. Refurbished camcorders are camcorders that people have returned to the store. The store then resells the camcorder at a significant discount. Typically, the store will look over the camcorder to ensure it's still functioning properly. If any repairs are needed, the store will do them. Still, you want to make sure you know the warranty options and the store's return policy. It possible there's an issue with the camcorder that's wasn't detected in the store's inspection.

The bottom line

There are many ways you can save money when purchasing a camcorder. Though the options we listed above are low-cost, they all offer great value without sacrificing quality. Ultimately, you need to use a camcorder that delivers the quality you need at the right price for your budget. Fortunately, there are a lot of great options out there. Shopping around is key to saving on camcorder costs. However, when shopping for a budget camcorder, or any type of camera, be sure to do your research and ensure what you're getting is what you're getting. Oftentimes, many online bad-faith actors will try to sell you a broken piece of equipment. Remember: If a deal looks too good to be true, it probably is. When shopping, shop around but also do your research. With that strategy, you will find the right camcorder for your budget. ▣

Jeff Chaves is the chief creative officer of Grace Pictures Inc. and is a full-time minister with over 12 years of experience in television broadcasting.

You can comment on this article by going online: www.videomaker.com/?p=73003614

by Stephen Mandel Joseph

Creating slow-mo iPhone videos

iPhones have gotten really good at making slow-motion videos. This guide will help you shoot your own slow-mo videos on your iPhone.

Apple has been consistently improving the iPhone's slow-motion video feature since the iPhone 5s series first launched in 2013. From the iPhone 5S to today's latest models, iPhones have helped their owners to capture slow-motion footage on the go.

The iPhone's slow-motion feature is quite impressive. You can take your videos and slow them down all at the touch of your fingertip. It's astounding because it's never been easier to capture slow-motion video. So, whether you're looking to add some "zing" to your videos or want to add a cinematic look to your next project, slow-motion is the way to go.

How slow-motion works with the iPhone

The standard programming speed on an iPhone is 60 frames per second (FPS). When you shoot a slow-motion video on your iPhone, you're essentially playing the video back at a slower frame rate. If you want to shoot a slow-motion video, you have to shoot it at a higher frame rate to capture more footage. When you slow down high-frame-rate footage to a standard frame rate, it appears to be in slow motion.

iPhone models with slow-mo technology record videos at 120 fps — half the standard shooting speed. But if you own an iPhone 8 or newer model, videos can record at 240 fps. The slow-motion effect allows you to capture great outdoor and action footage, such as nature and sporting events.

Which iPhones feature the slow-motion effects?

Apple iPhone 12
The Apple iPhone 12's has quite an impressive slow motion capabilities

The slow-motion effect became a standard feature on iPhone camera models with the iPhone 5S. Now, the A11 Bionic chip powers the iPhone 8 and newer models. The iPhone 11 and later models can shoot with their rear and front cameras. The iPhone 12, considered to be one of the best camera phones, records 120fps at 4K for HDR video and comes with super-zooms and more than three cameras. If you have an older iPhone or plan on switching, the iPhone 12 can shoot 1080p at 240 fps with excellent slow motion quality. However, if you are not looking to upgrade your phone, that doesn't mean you can't still create memorable video in slow-motion.

How to adjust the slow-motion feature

The fps and the quality of your video will depend on the iPhone model you own. Adjust your slow-mo settings to the highest quality for the best effects. Also, make sure to check to see how much storage you have before recording. Video files can take up a lot of storage. Once you do that, follow the steps below to adjust your settings:
1. Go to your Settings app on your iPhone.
2. Tap Camera
3. Hit Record Slo mo
4. How select the fps and resolution you want to use. This will vary depending on the phone model
5. Once finished, open your Camera app and start recording

Now you're ready to have some fun with your slow-motion video clips.

Recording slow-motion video

After opening your Camera app and choosing your phone's fps, tap the "record" button on the phone's screen or the side volume buttons, depending on your model. Keep in mind that unless you have an iPhone 11 or 12 or above, you can only use slo-mo with the rear camera. When you're ready to stop shooting, just tap the record button again and your footage will automatically save in the phone's photo library.

Adding slow-motion with the screen recorder app

There are several different techniques at your disposal to slow down your video clips; no outside equipment is necessary. Using preinstalled apps can slow down or speed up your footage. With the Screen Recorder, you can change the speed of your video on your iPhone. The app's built-in video editor can give you one of the best slow-motion effects.

Just follow these steps to launch the Screen Recorder app and set your next stunning slow-motion video clip:
1. Open Screen Recorder for iPhone app. Pick either the Facecam or Commentary button
2. Select the location of your video. You can choose from My Recordings or your camera roll. You can also go to the My Recording section, bypassing Facecam or Commentary
3. Pick the video you want to slow down
4. If you choose Facecam or Commentary, you can add edits and voiceovers. Once you're happy, hit the Next button. If you're using My Recordings, hit the Video Editor button
5. Select the Speed tab on the Video Editor screen
6. You can select either 0.25x or 0.5x speed to slow down your iPhone video. Hit the Tick mark icon after you've selected your option
7. Now hit Export and pick your video's resolution
8. Save your video

Slowing down a video with iMovie

Another way you can make your iPhone video into slow motion is to use the iMovie app. It's Apple's native video editing app and it's totally free for Apple device users. Just follow these few simple steps if you want to slow down or speed up video on your iPhone:
1. Go to the iMovie app
2. Hit the Plus + symbol and then select Movie.
3. Select the clip you want to slow down and hit Create Movie
4. Tap the video on the editing timeline until a yellow highlight appears
5. Select the Speedometer tab. You will find it near the bottom of your screen. After doing this, a slider with a rabbit and a turtle on opposite ends of each other will appear. The rabbit signifies a faster play speed, while the turtle signifies a slower play speed

The Apple iPhone 12's has quite an impressive slow motion capabilities

6. To slow down your video, drag the slider towards the turtle
7. Now apply the slow-motion effect to the rest of your video or to a specific part you want slowed
8. When satisfied with the speed, select the Done button to save your clip

Editing slow-motion video

Using the iPhone Photo app, you can do some basic editing right in the phone without having to transfer footage to a computer. With the Photo app, you can trim, straighten and crop iPhone videos. You can also change slow-mo to regular speed. The iPhone Photos app can also change the appearance of your slow-motion video by fine-tuning the exposure, contrast and color.

To access the editing tools in the Photos app:
1.Locate the video you want to edit and hit Edit.
2. When in Edit, you will see various sliders you can use to change the look and feel of your video
3. To change your video's exposure, go to the icon with a +/-
4. If you want to change the contrast of your slow-motion video, go to the button with a black and white circle
5. To adjust the saturation, select the super colorful icon
6. When you're happy with your video's look, hit Done

Remember that you are not limited to basic editing tools. If you're looking to add more excitement and art to your video clips, the App Store offers advanced slow motion and fast motion video effects with the Slow Motion Video Fx Editor. You can create tons of really cool effects from capturing screenshots to stop motion effects on your videos. Videoshop is also one of the most powerful video editors available in the App Store that allows you to edit slow-motion videos. It gives you the best post-production features, such as adding text, adding a soundtrack, changing transitions and much more.

Slow down to your heart's desire

The iPhone offers a variety of creative, easy-to-use apps and tools to produce fun and imaginative slow-motion video clips. You can capture photos while shooting in slow-motion. You can also create slow-motion videos on both the front and back cameras, depending on which iPhone you have. There is no limit to what your imagination can do with these tools. With a few basic and simple steps, you can join in on a fun and inventive way to make your own slow-mo videos that can really stand out and impress people. **V**

Stephen Mandel Joseph is a published, professional writer and director of several Sci-Fi 3D animated shorts and a short drama film.

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by W. H. Bourne

Loglines explained

If you've ever wondered what a logline is and how professionals use it, look no further than this in-depth guide.

You've just finished your script, and now you're ready to send it out to agents and producers. Undoubtedly, they'll ask: "What's your logline?"

What is a logline?
A logline is an extremely short description of your screenplay or film. Loglines are usually two sentences or less – the shorter, the better.

Why do I need a logline?
Your logline is a quick way to convey the key elements of your story to the reader or the listener. For agents and producers, loglines provide a means to quickly sort scripts or finished films. Would you read a book if you had absolutely no idea what that story was about? What if it was a fantasy novel and you really like science fiction? Your logline is a way to get the right set of eyes looking at your project.

"Don't Look Up" (2021). Image courtesy: Netflix

This is why they are so important when it comes to selling your completed creative vision. With that said, they shouldn't be an afterthought, nor something you just do when you finish your project. There is great value in developing your logline before you even start writing your script.

Important logline elements
Ideally, your logline should include your:
• Protagonist
• Antagonist
• Main goal or objective
If you are economical with your words, other valuable elements to include are your:
• Setting/world
• Genre
You can often imply genre and setting simply in the way you describe your other elements.

Why should I create one before I begin my project?
It's important to know and understand your story. When you establish a logline before writing your script, you're defining your script's story and determining the basic fundamental elements needed to tell it. Once you do this, it is much easier to create an outline or a beat sheet.

What if I am creating my logline after I have completed my project?
Distilling your logline into one or two sentences can be challenging, especially if you've spent months immersed in the story. However, think with broad strokes. If you are prone to writing lengthy sentences, craft your logline using 50 words or less. Additionally, if you can make your logline witty or catchy, that's even better.

What are some examples?
These are some loglines from recent movies.

"Don't Look Up" (2021)
"Two low-level astronomers must go on a giant media tour to warn mankind of an approaching comet that will destroy planet Earth."

The logline for "Don't Look Up" identifies the protagonists, the setting and their main objective.

Here is a longer, alternative version of the "Don't Look Up" logline that vaguely identifies the antagonists:

"Two astronomers go on a media tour to warn humankind of a planet-killing comet hurtling toward Earth. The response from a distracted world: Meh."

If you haven't seen the movie, does that second sentence provide you with a better understanding of its premise? Does it make you want to watch the movie more or less?

"Free Guy" (2021)
"A bank teller discovers that he's actually an NPC inside a brutal, open-world video game."

"Free Guy" (2021). Image courtesy: 20th Century Studios

This is a great logline. It's concise; it provides the key elements of the story and infers the rest. However, if your reader doesn't know what an NPC is, there's a high probability that they won't bother to read your script. But, let's face it; do you really want a famous romantic comedy producer making your high adrenaline, action-adventure film? ►►

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Where can I find more examples?

IMDB.com (the free version) is a great resource for loglines. The blurbs for movies on Hulu, Netflix or Amazon, especially older movies, are also usually good examples. However, remember the two-sentence rule. Many of the lengthy blurbs on streaming services are not actually loglines.

How can I learn to write a good logline?

Think of some of your favorite movies and try writing loglines for them. Remember to use the elements above. Once you've crafted your loglines, go on to IMDB and compare yours to the official ones.

What additional elements are worth including in my logline?

These elements are particularly useful:
• Is this a script for a TV series pilot or the first movie in a series of sequels?
• Is your project based on a true story?
• Is your project based on existing intellectual property (IP), like a book or a video game?
• Is your project based on an important person who actually existed?
   And for a completed project:
• Do you have named talent in your movie?

Are there any unusual elements that I might include in my logline?

Hollywood studios don't like to take chances on original ideas. This is why you see lots of remakes, sequels and derivative works. If a movie is very successful, studios want "the same but different." This is why some producers like the formula:
• Film 1 "meets" Film 2
   With this logline element, you refer to two — usually very — different films that capture the essence of your project. Consider this logline for an older Sandra Bullock and Ryan Reynolds film.

The Proposal (2009)

"She's a Type-A Manhattan executive with a she-devil reputation; he's her harried assistant – but getting this odd couple married is the only way she won't lose her immigration visa in this deft comedy."

If you used Film 1 "meets" Film 2 mashup, you might add this to the logline listed above by saying, "It's like 'Pretty Woman' meets 'The Devil Wears Prada.'" While this is usually an element reserved for a pitch meeting, it can also be helpful when you are creating your initial logline because it can suggest a tone or voice you might want to use when you begin writing your script. It is important to note that quite a few writers caution against the "meets" setup, especially if your project is not as strong as the films you are referencing.

What isn't a logline?

A summary or synopsis is not a logline. Your logline should only include the most basic elements of your story. Two extremely long sentences are bordering on being more than just a logline.

A tagline is not a logline. A tagline is a hook you might hear in a trailer or see on a movie poster. It is designed to pique the audience's interest, but it usually doesn't inform the reader of the basic elements of your project.

This is one of the best taglines of all time: "In space, no one can hear you scream." It's great for marketing, but it really doesn't convey the basic elements of the story. Can you guess the movie just from this tagline? The official logline is: "The crew of a commercial spacecraft encounter a deadly lifeform after investigating an unknown transmission." If you guessed "Alien" (1979), you are correct. But could you identify the movie before you heard the logline? Chances are, most people would have trouble knowing what the film was if not having seen the tagline beforehand.

Final thoughts

Remember, a logline is not just a requisite for selling your script or your film. It can help you define your story before you even begin writing. Get your project off to a great start by putting in the time and effort to create a good logline. ▶

W. H. Bourne is a screenwriter who is spending her pandemic time working on a screenplay that's an adaptation of a novel.

by Frank Dellario

A guide to tonal range

Tonal range is an important tool for all videographers. With it, we have the means to capture the full richness of a shot.

As videographers, we live to capture the images we see and create, but we may sometimes struggle to record the full richness of a shot. We may lose details in the bright or dark areas we see with our eyes because our cameras can't capture the same tonal range. Let's look at what tonal range is and isn't, how to know if we're capturing it properly with the camera in hand and how to adjust it.

What is tonal range?

Tonal range refers to the levels between an image's darkest and lightest points. In a shot, we see a range of tones and colors from darkest to the brightest, with various shades in between. We can always see and capture the darkest and the brightest tones on either end of the scale. It's the midrange values that we're concerned with. The wider the tonal range, the more levels of mid-tones in our image, and the more detail we can see.

Tonal range gives us choices to design a shot using contrast. High-contrast images have a full range of tones, from bright highlights to dark shadows, while low-contrast images have a smaller, shallower range. A bright, low-contrast image of people on a beach looks very different than a high contrast image with dark shadows, bright whites and many shades of gray. One could be a rom-com, and the other could be a movie employing the classic film noir style.

But what you see with your eyes only becomes an image once you record it. Can your camera capture that tonal range?

Dynamic range vs. tonal range

Dynamic range refers to the luminance range your camera sensor can detect and record, while tonal range describes the actual number of tones captured.

Ultimately, tonal range allows videographers to design their shots using contrast. Low-contrast shots have a low tonal range, while high-contrast shots have a high tonal range.

You may have a video camera with a wide dynamic range, but your shot consists of faded gray wood on the side of a barn. The shot has almost no blacks or whites, all gray mid-tones. This is a low-contrast shot with a low tonal range.

On the other hand, you may have a bright sunlit room with blown-out windows, bright reflections and dark shadows in the corners. This is a high-contrast shot with a high tonal range.

Measuring tone with the histogram

We measure tonal range in two ways: the histogram and the waveform.

A histogram measures the total tonal range of an image and is common on DSLRs. It measures the range of tone within the dynamic range of your sensor — from left, black, to far right, white, with shades of gray tones in between. Any vertical point on the graph represents the total number of pixels of that tone throughout your image.

Histogram

If we can capture the full tonal range of a shot, then our histogram will look like a bell curve with the black and white ends slopping off to zero.

If the sensor can't record the full tonal range of the image, you'll see a peak cutoff on either the black and/or white side of the histogram.

The image in figure 1. includes bright white walls and floors with overexposed reflections. The white end of its histogram is vertically cut off. We refer to this as "clipping." This means there are levels of white tones above this point that may be discernible to our eye but not to a camera's sensor. Since this range of white tones falls outside of the dynamic range of our camera, it will record as 100 percent white. No detail or texture will be visible in the clipped area. In this case, the hot kicks are just pure white.
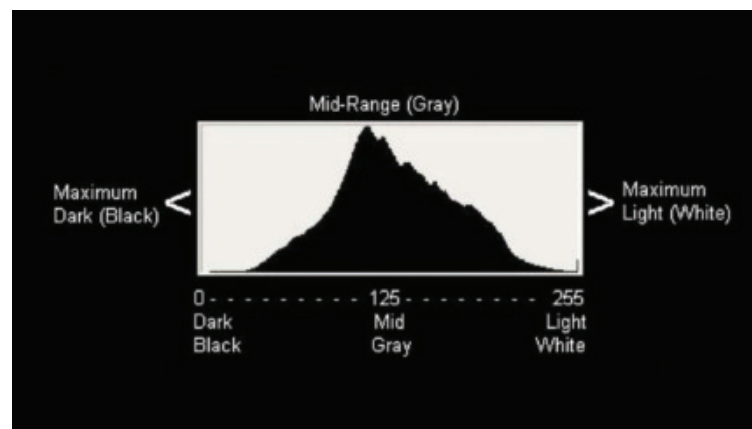
When your camera captures the full tonal range of a shot, then the shot's histogram will appear like a bell curve.

The waveform

The histogram — though easy to read — has limitations; it only displays the total tonal value for a whole image. It can't tell you where those hot or dark areas are in your image. However, a waveform monitor can.

Its vertical axis reads the light level: 0 at the bottom is black, 100 at the top for white. The horizontal axis corresponds with the same axis of the image from left to right and shows the light levels for a vertical section of it.

For example, in the image in figure 2., we see hot kicks on the floor behind our subject in the middle of the image. We see her shadow on the dark-toned chair at roughly that same vertical point in the image.

On the waveform monitor at that same horizontal point, we can see the reading of the hot floor kick "clipping" above 100. Also, her shadow displays as a line slanting up from about five to 25 as it grades from almost black to the dark red tone of the back of her chair.

A waveform gives you more specific information about the tonal range of specific areas in your image.

Shifting tones in your camera

Our eyes have a wide dynamic range, but we can't see that range's extremities simultaneously. For example, when we look at a person silhouetted against a blown-out window, our irises open up and close to adjust to the different light levels. Our eyes are unable to see the detail of the bright environment outside the window while simultaneously seeing the details of the person standing in front of the window.

The same concept applies to camera lenses. When you open your lens' aperture, you can see the details of the person. However, the window appears blown out. We've shifted the tonal range to capture the black side of our camera's dynamic range. As a result, we're letting the range's white end clip. Conversely, as we close the aperture, we shift the tonal range towards the white side of the tonal range. We can't see many details of the person but the window is no longer blown out. Now we're allowing the black end to clip.

Affecting the tonal range of your scene

Instead of shifting the tonal range with our camera, we could change it in the scene by adding light to the dark areas of the shot. Lighting the person against the window lowers the tonal range of our image.

We can also bring down bright areas by adding ND gel or nets to the blown-out window.

figure 1

figure 2

If there's a bright practical bulb in the shot, put it on a dimmer or use a lower wattage bulb.

We can also change the tonal range of our set, props and costumes. For example, a production can choose between using blue scrubs versus using white ones for a scene at a hospital.

These are all ways of adjusting the contrast on our set, bringing the blacks up and lowering the whites so they fit better within the dynamic range of our camera. We're lowering the overall tonal range of the scene so that our camera can record that range in our image.

The choice is yours

Whether your shots are from studio sets, locations or run-and-gun videography, you have choices available to you when capturing the tonal range you want. Keep what we discussed in mind and you will have the knowledge you need to capture the best image possible to tell your story. **V**

Frank Dellario is a professional producer, director and videographer with over 20 years of experience and is the co-founder of the award-winning creative team, the ILL Clan.

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PRODUCTION TIPS

by Sean Berry

4 background tips that'll make your action videos look pro

Your action video needs the right background to be the best it can be. Here are a few tips to help you make the most of your backgrounds.

Your action video needs the right background to be the best it can be. Here are a few tips to help you make the most of your backgrounds.

You don't necessarily need anything special to utilize your backgrounds. You don't need a green screen. You can use the natural terrain and the environment around you. Use the world that you're recording into your advantage.

Use the weather
No matter how sunny or rainy it may be, you can always use the natural weather and light to add highlights to your shot. The benefits of using the natural light of the sun can not be understated. Use natural light whenever you can.

Also, note though when you have a well lit background, the object will appear much darker and lose detail.

Adjust your angle of view to utilize natural light to keep your subject of the shot fully lit with ambient light to separate the object from the background.

Use backgrounds to show angles
Set your action cam on a level spot on the ground, a log, a rock, or a tree to get the perspective you're looking for

You need to set your camera at the right place to get the best shot. You can have a friend shoot a video of you performing the action so you can get a good idea what angles work before your ready for the final shot.

The placement of your action cam can either make or break your video. Setting an action cam on a level spot on the ground, log, rock, or tree can give you the perspective you are looking for with your video.

Realize what's in your background
You don't want things in the background to mess up your action shot. If you can you should arrange the background so there's nothing distracting in the background. So for instance, you can move a trash can out of the shot if it is in the way. If there's something you can't move, try the shot from different angles and find the best angle to cut out the distracting thing from your shot.

Perform a trial run
Also practice before you shoot. If you are shooting a scripted action scene with your camera, do practice runs with your actors. If it is not scripted, practice the shots and angles before the action happens. The more practice you have, the better the shot will come out. So, be sure to run through your shots before you hit record. Not only will it save you time in the long run, but it will also allow you to see the shot ahead of time and make any necessary adjustments.

So, when you're shooting with an action camera and want to make the most of your background, always look at the natural light, the background and the environmental aspects, and you will shoot high-quality video. The more practice you have, the better you will become. ◍

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