



Non-Approved Cameras

Sometimes, the optimal camera for a particular shot may not be included in GEM's approved camera list. When considering the use of a non-approved camera, it is important to take deliberate steps to ensure the best possible image quality. Before proceeding, consult with your GEM Production Manager and conduct real-world tests to verify compatibility with your primary cameras and overall workflow.

Key Settings for Achieving Optimal Image Quality

Resolution

Always use the highest resolution available on any camera system. Shooting at lower resolutions may utilize only portions of the sensor, altering the field of view (FOV) and potentially causing challenges during editing when cutting between clips of different resolutions.

Example: Full-frame UHD from an action cam versus cropped 2.7K capture.

Recording Format

Select the recording format that delivers the highest image quality. This can include either RAW formats or high-quality compressed baseband video. When recording compressed video, choose the format with the highest bit-depth and the lowest compression level. Intra-frame codecs are generally preferred over long GOP formats.

- RAW options include: RedCode, CinemaDNG, ArriRaw, Canon Cinema RAW Light, Sony X-OCN, and others.
- Intra-frame compressed video options include: XAVC-I, ProRes, DNx.
- Long GOP options include: H.264, HEVC.

Color and Transfer Function

Always record in the camera's native color space, a setting usually controlled via specific menu options—refer to the camera manufacturer's documentation for details.

- Typical transfer functions include Sony S-Log3, Arri LogC, GoPro ProTune Flat.
- Common color spaces include REDWideGamutRGB, Panasonic V-Gamut, and others.

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Important Note: Many cameras default to Rec.709 or sRGB color spaces. Although acceptable for monitoring, these are not ideal for capture. It is critical to record in the native color space to maintain quality.

Additional Considerations for Non-Approved Cameras

Though typically excluded because they do not meet GEM's minimum technical requirements, non-approved cameras may present other challenges:

File Naming

Professional cameras use standardized file naming conventions; non-approved cameras may not, which can cause duplicate filenames and complicate conforming processes. Coordination with your GEM Production Manager is advised.

Example: Some action cams split clips due to 4GB file system limits and do not allow custom file naming, potentially producing conflicting filenames across multiple units.

Timecode

Many non-approved cameras lack dedicated timecode inputs, making synchronization with audio sources challenging. As a workaround, consider recording a timecode feed from the sound department onto one of the camera's audio tracks.

Media Card Reliability

Approved cameras use professional-grade media designed for demanding productions. Consumer media cards used by some non-approved cameras may be prone to premature failure or data corruption. Following camera manufacturers' recommended media lists is encouraged.

Compression Format Issues

Certain codecs may not be suitable for digital intermediate (DI) workflows. Testing and creating intermediate files in proven formats such as DPX or Apple ProRes is advisable.

Overheating

Non-approved cameras might struggle in long takes or warmer environments; testing under expected conditions is essential to ensure performance.

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Clip Length Restrictions

Consumer and prosumer cameras often limit individual clip durations (sometimes as little as 10 minutes), which could impact production if long takes are planned.

Examples of Commonly Used Non-Approved Cameras

Below are examples of non-approved cameras that occasionally see use on GEM productions, along with recommendations for optimizing their use. Links to detailed camera guides are available for further information.

Apple

Camera	Effective Pixels	Preferred Recording Format
iPhone 15 Pro / Pro Max	4K: 4096x2160	Apple ProRes 422 HQ
iPhone 12 Pro	4K: 4096x2160	h.264 / h.265

DJI

Camera	Effective Pixels	Preferred Recording Format
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DJI X5S	5K: 5280 x 2972	Cinema DNG (5K), ProRes (5K)
DJI X5R	4K: 4096 x 2160	Cinema DNG (4K), ProRes (4K)
DJI X7	6K: 6016 x 3200	Cinema DNG (6K), ProRes (6K)
DJI Ronin 4D X9-8K	8K: 8192 x 4320	ProRes RAW, ProRes 4444 XQ

GoPro

Camera	Effective Pixels	Preferred Recording Format
GoPro Hero9	5K: 5120x2880	h.264 / h.265
GoPro Hero11	5K: 5312x2988	h.264 / h.265

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GoPro Hero12	5K: 5312x2988	h.264 / h.265
GoPro Hero13	5K: 5312x4648	h.264 / h.265

Panasonic

Camera	Effective Pixels	Preferred Recording Format
Panasonic AW-UE150	UHD: 3840x2160	No internal recording. See camera guide for capture recommendations.

Vision Research Phantom

Camera	Effective Pixels	Preferred Recording Format
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Phantom Flex 4K	4K: 4096 x 2304	CINE RAW
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