

SHOOTING HD WITH FILE-BASED CAMERAS: APPLICATIONS AND IMPLICATIONS

Film and HD video are two common HD shooting formats. The third, which is gaining popularity, is digital cinema which sits directly between film and video and is much closer in work style to film than to video.

Shooting with digital cinema cameras, the RED camera in particular, is not very different from shooting with film cameras. Crew size and lighting requirements are nearly identical. Just because it is digital cinema doesn't mean it requires less light. The imaging sensor area on the camera is the same size as a 35mm film frame, the same lenses are used, the same camera hardware for focus-pulling is deployed. However, there are no film magazines on the physical camera and no film stock to be loaded and unloaded.

On set, there are differences in the camera department personnel though crew size is usually the same. On a digital cinema shoot, in addition to the first and second ACs, there will be a digital imaging technician (DIT) and a downloader. In some instances the strict responsibility differences between a DIT and the ACs may overlap. The ACs' responsibilities are the same as on a film shoot: taking care of the camera, lenses, camera accessories and pulling focus.

The DIT works with the DP and is responsible for the setup of the many variables on the digital cinema camera. The DIT ensures the data capture is working properly and is in the correct format. Unlike the ACs, the DIT is responsible for the whole digital workflow from pre-production to delivery of the files to the editorial company.

The downloader makes backups on set, of all media shot so nothing leaves the set without having been backed up to at least three separate hard drives or other devices. Typically, one drive goes to the production company, one to the 'producer' and one to the editorial facility or digital lab for transcoding prep for editorial. The backup process goes on during the shoot and should be completed before closing the set.

In a tape-based HD video shoot, all image parameters are set by a technician in consultation with the DP and are recorded to tape. The look is 'baked' into the recorded image. The ability to manipulate the image in post will be dependent, in part, on the look established on the set.

In a digital cinema shoot, raw files are created. Raw files are low contrast, flat images and generally look washed out. Adjustments to contrast, color, tint, saturation, etc., can be made in the camera or on a laptop computer by the DIT in consultation with the DP. These are adjustments to metadata only—typically called look up tables or LUTs—and do not affect

the raw files. It is a non-destructive process. The look is never 'baked' in. The full range of control is always available with the raw files.

Setting a look on set does not slow down production. Typically 5 to 10 minutes are required to set a look suitable for evaluation while shooting. This should not be seen as competing with the final telecine color correction which typically is a more exacting and time-consuming process.

DIFFERENCES BETWEEN FILM AND DIGITAL CINEMA ACQUISITION:

Shooting in controlled settings, there is little if any difference. Shooting in very bright exterior settings, bright sunlight, the desert, one must take care. Unlike film, where highlights 'roll off' smoothly, highlights in digital images tend to clip abruptly. It is the responsibility of the DP in conjunction with the DIT to monitor and control highlight clipping.

Good lighting, proper exposure and the good judgment of an experienced DP in concert with a DIT, will almost always avoid exposure mistakes and lead to excellent looking images.

The RED camera shoots 4K files, a very high resolution format. Unlike film, there is no grain, the images are very clean, very sharp. They do not quite have the same organic, 'soft' look that 35mm film can deliver. However, through the use of filters and manipulation in post, almost any look is achievable. As in all photography, the skill and artistry of the DP and the way the set is lit, from landscapes to food to beauty, will determine what the final images look like.

CAMERAS:

1. RED ONE



A 4K, high resolution digital cinema camera. Records raw files. A good multi-purpose camera much like a 35mm camera. Uses 35mm lenses and standard accessories.

2. PHANTOM



Used for high-speed work. Is the Photosonics of the digital cinema world. Only records several minutes at a time.

3. SILICON SI 2K



A 2K camera, more like a 16mm camera than 35mm. The actual camera is very small--it can be attached to a helmet for example--and can go just about anywhere. Slumdog Millionaire was shot, in part, with an SI 2K.

4. Sony F35



Bridges the gap between HD video cameras and digital cinema raw cameras. A 1080 camera, it is closer to 2K resolution. It's the same as Panavision's Genesis digital 'film' camera and shoots beautiful pictures. A good choice if one prefers to not deal with meta data.

308 west 107th st. 5f
new york ny 10025
212.665.2679

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5. VIPER



A 1080 (2K) digital cinema camera which delivers raw files like the RED. Similar metadata schema and latitude as the RED. Benjamin Button was shot with the Viper.

6. DALCA ORIGIN



A specialized 4K camera which shoots 'uncompressed' files. Requires a lot of storage on set. Good for critical effects work because the files are not compressed.

ARCHIVAL SOLUTIONS:

1. LTO tape (data tape) Archive as soon as the footage is received, then start the transcoding process. Lifespan is estimated at 20 years.
2. Blue Ray DVDs (as data disks not DVD disks). Supposed to have a shelf life of 60 years. Blue Ray disks hold a lot of information and are a less expensive option.
3. Solid state hard drives are just coming onto the market. Though expensive now, they are very rugged, stable devices and may last up to 100 years.

FINAL OBSERVATIONS ON DIGITAL CINEMA:

1. Shoot the highest quality you can afford, even if you're only going to SD.
2. There should be a high quality client monitor on set, one as good as the DIT's monitor.
3. The RED camera does not capture HD. It captures more than 4 times the image area of HD. One needs to downconvert to get HD format. It is possible to pull still images from the RED camera if necessary.

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4. Shooting with the RED camera vs. film

- No film, no processing, no dailies
- Camera package rental costs and crew costs are very similar
- Soft costs like amount of footage shot, lack of slates and script notes can add to the costs.

5. Use HD terms appropriately. HD from film, HD from tape-based cameras and HD from file-based or digital cinema cameras.

6. Transporting and shipping hard drives is not generally an issue as long as they are packed in shipping boxes.