

A few terms used in the Cinema Industry Today

Film

Video - HDTV - HD

Digital Film

Digital Cinematography

Digital Cinema

E-cinema

D-cinema

Oslo 03/05/2006, Kommer Kleijn SBC, www.kommer.com

Film and Video

(original concepts: goal)

- Meant for Cinema
- Store and forward
- Demand for post prod possibilities
- High quality Goal
- Projection on big screen
- Designed for TV
- Real Time transmission
- Manipulation in post is a lower priority
- Need for low bandwidth
- Small screen makes filtering and compression more acceptable

Film and Video

(original concepts: technical characteristics)

- separate photographs
- no filtering (4:4:4)
- no data compression
- log
- choices of resolution and aspect ratios
- complete frames
- frames are acquired in their entirety
- Easy to treat frame by frame
- optimized to be re-worked/graded
- Uses color negative
- Serial stream of data
- filtered (4:2:2 or lower)
- uses data compression
- gamma corrected
- fixed line count (480, 576, 720, 1080) and aspect r
- interlaced (sometimes PsF)
- frames (or fields) are scanned from the top down
- Hard to treat frame by frame
- not meant to be re-worked
- closer to reversal or positive

Digital Film

- Appeared around 1987 for VFX needs
- A representation of film inside the computer
- Quality loss comparable to intermediate
- Routinely used since 1990 (cineon e.a.)
- Has slowly evolved towards D.I. (2000)

Digital Film and Video equipment

- D.F. Scanner
- D.F. Workstation
- Film recorder
- D.F. Camera
- Telecine
- Video Edit Suite
- Kinescope
- Video Camera

Hybrid Equipment

- Data-cines
- Real-time film recorders
- Real-time DF workstations
- Real-time DF scanners
- Most of the actually proposed cameras for Digital Cinematography are hybrids

Digital Film and Video

- file based --> 1 file / frame
- no filtering (4:4:4)
- no data compression
- 10 bit log (cineon format)
- many choices of resolution and aspect ratios
- complete frames (progressive)
- frames are acquired in their entirety
- not real time
- foreseen to be re-worked/graded
- represents a color negative
- a representation of film inside a computer
- stream based
- filtered (4:2:2 or lower)
- uses data compression
- gamma corrected
- fixed line count, fixed aspect ratio
- interlaced (sometimes progressive or PsF)
- frames (or fields) are scanned from the top down
- real time
- not meant to be re-worked
- closer to reversal or positive (TV print)
- a representation of a TV broadcast

Digital Film and Film

- file based --> 1 file / frame
 - no filtering (4:4:4)
 - no data compression
 - 10 bit log
 - many possible choices of resolution
 - complete frames
 - frames are acquired in their entirety
 - Easy to treat frame by frame
 - optimized to be re-worked/graded
 - represents a color negative
 - a representation of film inside a computer
- separate photographs
 - no filtering (4:4:4)
 - no data compression
 - log
 - many possible choices of resolution
 - complete frames
 - frames are acquired in their entirety
 - Easy to treat frame by frame
 - optimized to be re-worked/graded
 - Uses color negative

DF Camera - Video Camera

- Stable back focus
- Sturdy metal body
- Prepared for accessories
- Film size sensor
- Single Sensor
- Variable frame rates
- Color viewfinder with surroundings image
- Records entire frames (no scanning)
- Records 10 bit log or equivalent
- No data compression or filtering
- File based output
- DF color space
- Back focus adjustment
- ENG style plastic body
- Less acc needed for ENG
- Smaller sensors
- 3 sensors and color prisms
- TV frame rate (field rate)
- B/W viewfinder show only what is in the signal
- Images are scanned
- Uses interlacing
- 8 bit gamma corrected
- Use of filtering and data compression (generally)
- Output is a signal stream or data stream
- Video color space

Status of Cameras

CAMERA	Sony HDW900	Panasonic VARICAM	Thomson VIPER	Panavision GENESIS	Arri D20	Dalsa ORIGIN
Optically stable (back focus)	-	-	-	YES	YES	YES
Sturdy metal body	-	-	-	YES	YES	YES
Prepared for filmstyle accessories	-	-	-	YES	YES	YES
Film size sensor	-	-	-	YES	YES	YES
Single Sensor	-	-	-	YES	YES	YES
Variable frame rates	24	YES	24	24	24	YES
Color viewfinder with surroundings (arial image)	-	-	-	-	YES	YES
Records entire frames (no scanning)	-	-	-	?	YES	YES
Records 10 bit log or equivalent	-	-	YES	-	YES	YES
Records progressive frames	PsF	YES	YES	PsF	YES	YES
No data compression	-	-	rec dep	-	rec dep	YES
No filtering	-	-	YES	YES	YES	YES
File based output	-	-	-	-	-	YES

Status of Cameras

DC CAMERA	KINETTA	RED	Silicon Im	Sony DC
Optically stable (back focus)	YES	YES	YES	?
Sturdy metal body	YES	YES	YES	?
Prepared for film style accessories	YES	YES	YES	YES
Film size sensor	YES	YES	YES	-
Single Sensor	YES	YES	YES	-
Variable frame rates	YES	YES	YES	YES
Color viewfinder with surroundings (arial image)	YES	YES	-	-
Records entire frames (no scanning)	YES	YES	YES	?
Records 10 bit log or equivalent	YES	YES	-	-
Records progressive frames	YES	YES	?	PsF
No data compression	YES	/	-	-
No filtering	YES	YES	YES	YES
File based output	YES	YES	?	-

Conversion

- Digital Film and Video can be converted from one into the other and vice – versa
- Conversion Video <--> D.F. Cheaper and easier than Kinescope / Telecine.
- Conversion: color space, resizing, filtering (Interpolation, RGB), de-interlacing
- Video ---> D.F. ---> Film recorder
- D.F. ---> Video (D.I. --> DVD)

Pixels and Bandwidth

Line	Title	W	H	pixels/im	Dep	bits/im	fps	bits/sec	Mbit/s	HDCAM	Rapport
1	SD	768	576	442.368	8	10.616.832	25	265.420.800	265		
2	SD	640	480	307.200	8	7.372.800	30	221.184.000	221		
3	SD	720	576	414.720	8	9.953.280	25	248.832.000	249		
4	SD	720	480	345.600	8	8.294.400	30	248.832.000	249		
5	SD	720	486	349.920	8	8.398.080	30	251.942.400	252		
6	HD 720	1.280	720	921.600	8	22.118.400	60	1.327.104.000	1.327	100	13
7	HD	1.280	720	921.600	8	22.118.400	50	1.105.920.000	1.106	83	13
8	HD	1.280	720	921.600	8	22.118.400	25	552.960.000	553	42	13
9	HD	1.280	720	921.600	8	22.118.400	24	530.841.600	531	40	13
10	HD 1080	1.920	1.080	2.073.600	8	49.766.400	30	1.492.992.000	1.493	140	11
11	HD	1.920	1.080	2.073.600	8	49.766.400	25	1.244.160.000	1.244	117	11
12	HD	1.920	1.080	2.073.600	8	49.766.400	24	1.194.393.600	1.194	112	11
13	HD-1.85	1.920	1.038	1.992.649	8	47.823.568	24	1.147.765.622	1.148	112	10
14	HD-2.35	1.920	817	1.568.681	8	37.648.340	24	903.560.170	904	112	8
15	DF-1.85	2.048	1.107	2.267.191	10	68.015.741	24	1.632.377.773	1.632		15
16	DF-2.35	2.048	871	1.784.810	10	53.544.306	24	1.285.063.353	1.285		11
17	DF-1.85	3.072	1.661	5.101.181	10	153.035.416	24	3.672.849.989	3.673		33
18	DF-2.35	3.072	1.307	4.015.823	10	120.474.689	24	2.891.392.545	2.891		26
19	DF-1.85	4.096	2.214	9.068.765	10	272.062.962	24	6.529.511.092	6.530		58
20	DF-2.35	4.096	1.743	7.139.241	10	214.177.226	24	5.140.253.413	5.140		46

Digital Cinematography

Digital Cinematography =

- Shooting Moving Imagery using Digital electronic capturing, using either a
- Video camera (HD/SD)
- Digital Film camera
- Hybrid camera

Digital Cinema

- Used for all aspects concerned with the Digital distribution and projection of movies in cinemas using Digital Film equipment.
- D-cinema uses D.F. Projection equipment
- E-cinema = using Video Projection equipment for lower end cinema distribution. (Electronic Cinema)
- D-cinema uses Digital Film equipment

Digital Cinema Projection

- Low destructive compression
- Entire frame refreshed
- Multiple frame rates
- Contrast equivalent to print film
- Wide and controlled color space
- Standardized light power level

D-cinema

- Low destructive compression
- Entire frame refreshed
- Multiple frame rates
- Contrast equivalent to print film
- Wide and controlled color space
- Standardized light level

E-cinema

- Higher compression acceptable
- May scan like video
- Fixed frame rate of 25 fps (30)
- Lower contrast of video projectors
- Lower light output levels.
- Lower resolution

Thank you for your attention

Please feel free to comment or question,
now or later

kommer@kommer.com