

What do we mean by D–Cinema?

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Agenda

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European Digital Cinema Forum

- A membership organisation interested in the deployment of Digital Cinema technology.
- Founded by organisations in France, Sweden and UK.
- Broad membership of people from all aspects of Cinema.
 - Exhibition, Studios, Distributors, Mnfrs...

Member Benefits

- Essentially a network of interested parties who share opportunities, problems and issues.
- Organisation divided into three groups:
 - Technical Support
 - Distribution Support
 - Exhibition Support.
- Output of Guides and Representation

What do we mean by D Cinema?

- Major Studio approved presentation system
- Use of Electronic (filmless) projection.
- Movie content stored digitally.
- Movie data is encrypted and keyed.
- Audio and Sub-Titles are included with content.
- A pre-requisite for the new Digital 3D.

D Cinema – Pre History

- Movie industry looking for film replacement for several years to:
 - Improve quality.
 - Lower distribution costs.
 - Enable wider releases. (more 1st run prints)
- Electronic projection in 90s
 - First high brightness systems – unstable
 - Quality an issue.
 - Storage still expensive
 - First LCD projectors ‘interesting’

D Cinema – The Formative Years

- Texas Instruments introduced DMD technology
 - Digital Micromirror Device (DMD)
 - Later named Digital Light Processing (DLP)
- Standard Definition systems taken to Hollywood
 - 768 x 576 pixels (Standard Definition TV Format)
 - Progressive Display.
 - ‘Filmic’ Look
 - Whole frame look
 - Contrast
 - Colour
- Movie Makers wanted more...

Movie Maker Needs of Projector

- 24 fps (like film)
- Widescreen and scope.
- Colour same as film.
- More contrast
- More resolution.
- Encrypted signals
- Sub-title and graphic processor
- High quality resizing processor.

The Formative Years 1995-1999

- Seven generations of prototypes taken to Studios, Cinematographers, Post Production.
- Demos to ASC, DGA, Euro. Cinematographers.
- Single biggest demand was for higher contrast and accurate and colorimetry.
- Paramount and Disney were early supporters
 - All studios cooperated in the definitional work.
- TI asked what was needed and demonstrated the new capability with each prototype.

The Trial Phase 1999 - 2003

- Lucas Film were pioneering digital capture with the aid of Sony's new camera.
- Decided to release Star Wars Episode 1 – TPM at four sites (two East Coast two West Coast) with two preeminent projectors
 - Hughes JVC ILA
 - Texas Instruments DLP Cinema (v 6)
- Tests were very successful. (Audience reaction)
- Disney followed with digital release of Tarzan in multiple screens.

Field Trials 2000 - 2003

- Next stage was to prove the reliability and operability in a live theatrical environment.
- Technicolor (who wanted to be part of the digital revolution) agreed to help fund a formal field trial along with Disney.
 - TI Projector, QuVis Disks, NuVision, Miranda, UPS.
 - Sites in USA and Europe
 - London, Manchester, Paris, Brussels, Madrid then Koln, Duseeldorf, Vienna, Birmingham others.
 - Toy Story 2 was first European Digital movie.

Field Trials - Results

- Equipment performed very reliably.
 - Images stable.
 - Sound surprised people.
- Projectionists adapted very quickly. (surprise).
- Faults were mainly minor (connections) and interference from film projectors.
- Data loading was very tedious and unforgiving (took several hours).
- QuBit drives were sensitive to shock in transit.

Trial Phase

- Warner and Disney were first to provide content but all studios got involved.
- ‘Bounce’ was first live satellite release.
- Lots of other ‘Firsts’ as tests were done with live and recorded events and different delivery formats.
 - All successful but all required extraordinary work.
 - No standards in place other than the TI implementation. Still debates going on about technical options for the future.

The Commercial Questions?

- Who would pay for these very expensive systems (initially about \$350K each).
 - Answer: Studios would pay Lion's share/
 - How would this happen.
- Who would supply the equipment?
 - TI Licenced 3 companies (USA, Europe, Japan)
- Many funding models to detach the Studios from the arrangements.
- Still the technical questions were debated.

Digital Cinema Initiatives - DCI

- Hollywood Studios needed to cooperate but any form of cooperation carries a risk of falling foul of anti-competition law.
- DCI formed to only work on technical requirements:
 - Resolution
 - Colour Space
 - Compression
 - File Format
 - Security

DCI Process

- Driven by the 6 Hollywood Studios but inviting all movie interested parties to contribute.
 - EDCF played an active role.
 - Motivations were principally about affordable quality and differentiation from mainstream TV and Video.
 - Debates about how far forward to provision?
- First draft of the long awaited report came out in July 2005.
 - Security aspects and other detail followed in two further revisions.

Making the Standard

- DCI Requirement is not a standard. It's a specification of a requirement.
 - Needed much work to form an acceptable standard.
- SMPTE formed DC28 Group to undertake this work – initially chaired by Wendy Aylsworth at Warner Bros.
- Work will complete in next 12 months with many sections already finalised.
- New Dimensions added for Stereoscopic 3D.

Managing the Transition to SMPTE

- Several thousand systems are already installed and the standards are not yet complete.
- Manufacturers have agreed to ensure that systems are compatible and interoperable.
 - Major undertaking with an evolving standard.
 - Requires cooperation of competitors.
- ISDCF formed to work on the practical problems of deployment.
 - Many issues of practical (unspecified) nature.
 - Helps navigate studio opinions.

D Cinema Benefits

- Superior Presentation of Movies
 - Images Quality
 - Contrast, Colour
 - Framing, Aspect Ratio
 - No Wear (Dust, Scratches Weave, Jitter, Bleaching Fading, Focus Flutter).
 - CONSISTENCY
 - Sound Quality
 - Up to 16 Channels. 48kHz, 24 Bit, Uncompressed Discrete.
 - Normally 6.1, Sometimes 8.1
 - Sub Title Quality and Flexibility.
 - Automatic Operation.

D Cinema Flexibility

- Playlist is electronic.
 - Can be changed like a spreadsheet.
 - Enables programming to be changed during day.
 - Ad Content and Trailers can be adjusted.
 - Sub-titles can be changed.
 - Different versions Could be shown. (more)
 - Programming includes automation commands.

D Cinema Flexibility

- Enables Digital Advertising on same system.
 - Better colours, widescreen, no wear.
- Enables other uses in off peak times:
 - Use for business presentations – Powerpoint
 - Product launches with movies and slides.
 - Can show local or private content.
- Enables Live Event screening
 - Sports, Concerts, Shows, Opera, Ballet, National Interest Celebrations, Weddings, Anniversaries.
- Enables more Specialist/Diverse programming
- Opportunities for Sponsorship, Concessions, Souvenirs

Alternative Content Challenges

- Conflict with Movies (Not a real problem yet).
- Projectors have performance but not all the interfaces as standard.
- Massive variety of Formats to handle
Tapes, Disks, SD, HDV, HD, Frame Rates,
Aspect Ratios, Colour Coding, Digital or Analog
Frame Sync, Ref, Setup, Field Dominance.
- Aptitude and Training required for technicians if not premastered material.

Venue Wide Deployment

- Economic benefits linked to Site level deployment
- Often a prerequisite for commercial deal.
 - Must have a play out path.
- Demand balancing requires different sized theatres with digital projectors.
 - Not practical to move projectors around.
- Central Libraries can optimise the storage and manage the Show Play List assets
- Easier content loading. More compact players.
- Easier to monitor Systems performance and problems.
- Easier to manage Reports and Audits
- Easier to promote Digital Presentation.

The Virtual Print Fee

- Scheme to subsidize the cost of D Cinema equip.
 - Covers Projector and Server
 - Doesn't cover reconfiguration costs (portholes, power, and AC)
 - Doesn't cover 3D equipment
 - Doesn't cover Alt. Content equipment.
- Pays up to an agreed share of the agreed costs over an agreed time period.
- Normally paid per screen.
- Many variants

VPF Deals

- Contracts have taken a long time to transact.
- Only one Integrator in Europe with 5 of 6 studio deals.
- Studios will talk to everyone but can only practically service a small number of deals.
 - Arrangements are complex.
 - Are long in nature (7 to 15 years).
 - Fundamental to profitability.
 - More complex in Europe (Local Content/Advertising/Multi Lang).
- All but the biggest operators should consider the Integrator solution who manages risk as well as negotiation.
- More integrator deals are expected soon...

3D – How does it work?

- Depth Perception is a neural task.
- Most depth information is monocular and derived from scene analysis.
- The depth view is created by two eyes working together but delivering slightly displaced images due to the lateral separation of our eyes.
- This perception is called ‘Stereopsis’ and arises from the ‘Retinal Disparities’ and binocular processing in the brain.

Stereoscopic Perception

- Stereopsis is not true 3D.
- A 3D image could be viewed from all positions.
- This is not helpful in Cinema or TV.
 - People on the side would see a different view.
- Stereopsis works most successfully for objects within arms reach and for up to about 10m.
 - The more distant the object the smaller the RD.
- Stereographer can change the 'depth' by changing the 'interocular' distance.
- This presents new opportunities and challenges

Why the excitement about 3D?

- 3D can be delivered today in Cinemas
 - Not available on TV
 - Not available on DVD
 - Not available on Home Cinema
 - Only available on some games.
- Ultimate special effect tool
 - Drives senses of balance and motion
 - Carries a burden and responsibility.

Who is Driving £D?

- Major Studios
 - Have tasted the first results and can see a major lift to box office in the face of increasing piracy.
 - Much harder to copy and present.
 - Animators love it (Katzenberg 2009 commitment)
- Major Directors
 - Headline Directors like James Cameron, George Lucas, Robert Zemeckis, Robert Rodriguez.
- User Response
 - Early Box Office results. Hannah Montana

3D Requirements

- Digital Projector (DLP Version).
- High Brightness Configuration.
- 3D capable server.
- Silver Screen for polarised systems.
- Image Modulator (for non active systems)
- Special Glasses (in all cases)
- Synchroniser for Active Glasses.
- Glasses handling for non disposable glasses.
 - Staffing and Cleaning

Current Choices - Dolby

- Works by filtering the colours to each eye.
- Uses modified projector (with colour wheel)
- Needs Dolby server (with colour splitting software)
- Needs Dolby special passive glasses
- Doesn't need a special screen except for brightness.
- Glasses are not disposable and must be recycled in theatre.

Current Choices – Real D

- Works by polarising light to each eye.
- Uses Z Screen attachment to projector (fits in front of lens)
- Needs any 3D server.
- Uses disposable pre-packaged glasses.
- Needs a polarisation preserving screen (silver).
- Normally uses pre-processed (GB) images for best results.

Current Choices – MasterImage

- Works by polarising light to each eye.
- Uses polarising attachment to projector (fits in front of lens)
- Needs any 3D server.
- Uses disposable pre-packaged glasses.
- Needs a polarisation preserving screen (silver).
- Normally uses pre-processed (GB) images for best results.

Current Choices – NuVision

- Works by switching light to each eye.
- Uses synchroniser attachment to projector (fits in auditorium)
- Needs any 3D server.
- Uses NuVision active non-disposable glasses.
- Doesn't need a special screen except for brightness .
- Normally uses pre-processed (GB) images for best results.
- Glasses are not disposable and must be recycled and charged in theatre.

3D Outlook

- First results have been excellent with 3-6x multipliers on 2D box office.
 - Is this sustainable?
- Studios promising continuous supply of 3D content.
 - 3D Animation – Dreamworks, Toy Story 3
 - Repurposed existing 3D Movies
 - Dimensionalised 2D Classics
 - New Live Action Movies
 - Live Action Broadcasts, Concerts

3D Movies in the Mill

- Fly Me to the Moon
- Journey 3-D
- Monsters vs. Aliens
- Avatar
- Shrek Goes Fourth
- Battle Angel
- Final Destination 4
- Alice & Wonderland
- Crood Awakening
- A Christmas Carol?
- Tin Tin
- How To Train your Dragon
- Puss in Boots
- Star Wars

New Developments

- All DLP® HD TVs are now '3D Ready'.
- Movie industry welcomes 3D TV.
 - 3D HD DVD Format needed.
 - 3D Monitors needed for Post Production.
- Philips showcased Auto-Stereo LCD TV.
- Nippon BS Broadcasting Corp. will launch Sat HD channel on Dec 1st.
- 3D@Home Alliance formed with leading companies.
 - Announcement at NAB
- Sensio announced 3D encoder/decoder for HD.
- Post Houses gearing for 3D productions.
- Probably a 5 year de-facto 'window' for Cinema.

3D in 2008

- **January 25th 2008: *U2 3D*:** Performances from seven different shows of U2's Latin America Vertigo Tour in early 2006. Previews of this film have tested incredibly well.
- **February 15th 2008: *Fly Me to the Moon*:** A computer animated tale of three young houseflies stow away aboard the Apollo 11 flight to the moon. Tim Curry, Nicollette Sheridan, Christopher Lloyd, Robert Patrick and Kelly Ripa voice characters.
- **July 11th 2008: *Journey 3-D*:** Visual effects supervisor turned director Eric Brevig's take on the classic Jules Verne novel, Journey to the Center of [the Earth](#). Brendan Fraser and Josh Hutcherson star.
- **October 2008:** Tim Burton's *The Nightmare Before Christmas*: Disney has said they plan to rerelease the film around Halloween as long as it remains profitable.
- ***Final Destination 4*:** Final Destination 2 director David R. Ellis returns to the franchise. Interestingly enough, Final Destination 3 was in development under the working title Final Destination 3-D, but the produces ultimately chose not to produce the movie in 3D due to costs and complications. This film might be pushed to 2009.

3D in 2009

- **March 27th 2009: *Monsters vs. Aliens*:** A reinvention of the classic '50s monster movie. Directed by Rob Letterman (Shark Tale).
- **May 22nd 2009:** James Cameron's *Avatar*. A band of humans are pitted in a battle against a distant [planet's](#) indigenous population. Michelle Rodriguez, Zoe Saldana, Sigourney Weaver, Giovanni Ribisi star. \$190 million budget.
- **October 2009:** Tim Burton's *The Nightmare Before Christmas*: Disney has said they plan to rerelease the film around Halloween as long as it remains profitable.
- **November 6th 2009: *A Christmas Carol*:** Has not been publicly confirmed as a 3D release, but the film will use the same performance capture technique Robert Zemeckis also used in Polar Express and Beowulf. The classic retelling will star Jim Carrey as Scrooge and the three ghosts. Tom Hanks, Michael J Fox, Christopher Lloyd, Bob Hoskins are also rumored to be on board the project.
- **November 20th 2009: *How to Train Your Dragon*:** Based on the 2003 children's novel by British author Cressida Cowell, about the adventures of Hiccup Horrendous Haddock III - The teenage son of a Viking chieftain, who must capture a dragon for a rite of passage.
- ***Crood Awakening*:** A [comedy](#) set in the stone age directed by Chris Sanders (Lilo & Stitch)
- ***TinTin*:** Directed by Peter Jackson or Steven Spielberg. The adventures of popular Belgian comic-strip hero Tintin and his faithful dog Snowy.
- ***Tim Burton's Alive in Wonderland*:** Screenplay by Linda Woolverton (The Lion King) based on the Lewis Carroll classic. Film will be combine performance-capture technology with live-action footage.
- ***Deep Sea-quel*:** As the name suggests, a sequel to the popular 2006 3D documentary Deep Sea 3D. An underwater look at the diverse coastal regions of Southern Australia, New Guinea and the Indo-Pacific areas and the impact of [global warming](#) on the oceans. IMAX.

3D in 2010

- **May 21st 2010: *Shrek Goes Fourth*:** The further adventures of the giant green ogre, Shrek, living in the land of Far, Far Away. We will discover how Shrek arrived in that swamp. Not to be confused with Shrek 4-D which is a theme park attraction.
- **October 2010:** Tim Burton's *The Nightmare Before Christmas*: Disney has said they plan to rerelease the film around Halloween as long as it remains profitable.
- **Fall 2010: *Master Mind*:** A [satirical](#) take on superhero movies, in which a notorious villain loses his oomph after he accidentally kills his nemesis.
- ***Untitled Tintin Sequel*:** Directed by Peter Jackson or Steven Spielberg. The continued adventures of popular Belgian comic-strip hero Tintin and his faithful dog Snowy.
- ***Puss in Boots*:** A *Shrek* spinoff starring sword fighting cat voiced by Antonio Banderas. They haven't officially announced this as a 3D title, but Jeffrey Katzenberg has said that all animated films released by Dreamworks after 2009 will be released in 3D.

3D in 2011

- ***TinTin 3:*** Directed by ????. Spielberg has said that he may direct this in collaboration with Peter Jackson, or that they might hire someone completely new. The continued adventures of popular Belgian comic-strip hero Tintin and his faithful dog Snowy.
- **In Development:**
- Tim Burton's ***Frankenweenie:*** A feature length remake of his 1984 short film. A parody of the 1931 Frankenstein film. When young Victor's pet dog Sparky is hit by a car, Victor decides to bring him back to life the only way he knows how. But when the bolt-necked "monster" wreaks havoc and terror in the hearts of Victor's neighbors, he has to convince them and his parents, that despite his appearance, Sparky's still the good loyal friend he's always been. Burton will shoot the film using stop-motion animation.

Battle Angel: James Cameron's adaptation of the graphic novel about a female cyborg who is rescued from the scrapheap by a scientist, who becomes her surrogate father.

- ***Star Wars:*** George Lucas has announced plans to remaster all of the Star Wars films in 3D. When this might actually happen is anyone's guess.
- All dates subject to change.