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# DIGITAL CINEMA

AT SHOWEST

## A LOOK AT THREE KEY PLAYERS IN THE COMING REVOLUTION

### POISED FOR TAKEOFF: *Boeing to Unveil Business Plan in Las Vegas*

By Clyde McKinney



A new company is entering the digital-cinema market. The Boeing aircraft company's Digital Multimedia Systems group is set to unveil their business plan to the theatre industry at ShoWest 2001. The unit will concentrate on the secure transport of digital motion picture content via their worldwide satellite network. Currently, the service is called Cinema Conexion, but look for a new moniker and an in-depth description of the service at ShoWest in Las Vegas Ballroom 5.

On Nov. 14 of last year, the Boeing group successfully tested the transport of the digital-cinema media files for the movie *Bounce*. The data files were encrypted for transport and sent from Tulsa, OK, to the AMC Empire Theatre in New York City. There, the files were decrypted back into the standard digital show files and transferred to a QuVIS server system. The movie presentation was projected using a Texas Instruments Digital Cinema Projector. The same encrypted file set was sent via fiber to show that the transfer medium is not critical.

The satellite transmission process took some ten hours to complete. The movie content went to just one theatre, but could have just as easily gone to all of the theatres in the world. According to David Baker and Fred Medina, co-directors of the Digital Multimedia Systems group, the transport system is not a point-to-point, but rather a broadcast-based system that can be received and decrypted only by the theatres that have contracted to show that particular movie in their theatre. The intent of the group is not to become a distributor, but rather the "armored car" service for the industry. The contract for the software would be between the distributor and the theatre or theatre chain, as it is today. Cinema Conexion would be the secure transport service, analogous to the film-transport systems used today.

Using military-level secure transmission, the digital-cinema data files are sent up to the satellite network and then broadcast back to the reception area. Any theatre with the correct reception code can receive the data and decrypt it. All other reception points get just unusable data transmission. This process is used today for secure banking, voice and military transmissions. In essence, without a current "key," there is no usable data.

In areas that simply cannot get a dish pointed in the right direction, or in cases where some local distribution arrangements demand it, the files may be received by satellite at a central reception point. From this distribution point, the files are sent out by fiber to the individual the-

atres, or they can be transferred to disk for physical hand delivery. The most cost-effective and immediate form is the direct satellite transmission. A feedback channel will send back any transmission-error messages. In this manner, any lost portions of the broadcast can be rebroadcast and the theatres that had data loss would get the missing pieces. In the Nov. 14 test, the weather conditions were not ideal, with heavy rain showers present, but the transmission was completed without data loss, proving the process does work.

The key here is not just the technical achievement of sending secure data via satellite, it is that the data can be sent much less expensively than current film-based transport, with arguably better security. Current estimates have the film-based distribution process costing on the order of \$1 billion per year. Baker estimates that cost could be cut by as much as 75 percent. This cost savings could be used to produce more software, reduce the cost of the software to the theatre by changing the split, or initially be used to help underwrite the cost of the upgrade of the industry to the new digital-projection systems. The digital-projection system cost estimates vary widely depending on what is considered as "the system," but initially, the costs will need to come in at about \$130,000 per screen. Going at it one screen at a time is not the most cost-effective way, but high percentage equipment upgrades represent a tremendous cost to an industry that today is on its knees financially. Furthermore, the change would not fundamentally alter the revenue amount to the theatres. It does radically change the costs for distribution. Fred Medina suggests that the Boeing finance group would be willing to come forward and finance systems for the industry, as soon as viable production systems are available.

The satellite systems are off-shelf. The local area high-speed networks



## DIGITAL CINEMA

places at risk potentially very large investments.

The good news is that this method of wide distribution of high-quality visual and sound media opens up the theatre's access to additional forms of entertainment and advertising that could increase the potential for added revenue. It could also expand the audience market share by adding entertainment segments that currently do not represent a large enough potential sales market to turn a profit, using the current film-based distribution system. It all points to better access to the theatres for small and independent producers and a wider variety of entertainment choices for the viewing public. The system also affords the chance to see live or only slightly delayed entertainment events that currently can only be achieved over traditional television transmission channels. And let's not forget the potential upside in quality. Just like a CD, the quality on the first play is the same as on the last play. As Phil Barlow, executive VP of Walt Disney's Motion Picture Group, so aptly stated, "You can't scratch ones and zeros."

So what can we expect to see at ShoWest from the Digital Multimedia Systems group of Boeing? According to Diana Ball, director of public relations for the group, they have taken Ballroom 5 and plan a large display to introduce the group and its new name to the industry. It will be generally split into three major areas that explain the process of transporting the data from the distributor to the theatre. David Baker feels that by seeing the process defined in an easy-to-understand visual display, the industry will be better able to see the relationship of each sector of the industry. It will also explain how the different sectors will interact in order to create a smooth process that will assure that software is in the theatre in a form that can be used in a timely manner and at an affordable price.

## TWO MILLION MOVIEGOERS AGREE: DLP Cinema Is Ready

By Brooke Williams  
 Manager, Field Demonstration Program  
 DLP Cinema Products, Texas Instruments

W e at Texas Instruments (TI) have been receiving positive feedback for over a year. Theatre patrons are starting to notice the "scratches and shakiness" of film-based movies. Moviegoers note the old-fashioned look of film, described as "not as colorful as and less clear than" digital movies. And finally, countless e-mails thank us for providing a "wonderful," "mind-blowing," "awesome" cinematic viewing experience.

Indeed, DLP Cinema™ digital-projection technology is demonstrating to today's moviegoer that digital enhances their viewing experience. Two million people

and servers are in process, with the QuVIS system representing one of the solutions. The sound systems are also off-shelf. The current holdup is the availability of sufficient high-resolution projection systems and a set of industry standards. The definition of a standardized file-authoring format and a set of projection standards that will allow current projectors to be installed—knowing that the state of the art will mature and substantially exceed the current resolution, color scale and contrast—is a vital part of the formula. Until these issues are resolved, large-scale installation of equipment will not go forward. To do so

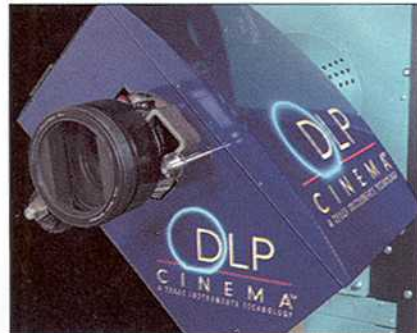
have seen a movie shown on a DLP Cinema projector—and the reaction has been overwhelmingly positive. Sixteen theatre circuits agree the DLP Cinema system is reliable and easier to work with, and eight studios that have released a total of 18 movies in digital format are fueling the momentum of digital cinema.

Over four years ago, TI began a quest to replace film with DLP Cinema™ projectors. Working in collaboration with a broad range of industry experts, TI engineers iterated through many generations of projector designs until the specified quality level was achieved. TI then teamed with Technicolor Digital Cinema and major theatre circuits to introduce the current field-demonstration program. Read on for an overview of the amazing progress during the program's first full year.

### WORLDWIDE EXPANSION

By January 2000, 12 projectors had already been installed. These installations were structured around a two-year agreement, with equipment costs shared between Technicolor and theatre owners AMC, Buena Vista Theatres, Cinemark, Edwards, Famous Players and Harkins. TI provided the DLP Cinema projectors, while Technicolor provided the distribution system and other equipment necessary to add digital capabilities to existing booths.

In February, four European sites were added through Gaumont, Kinopolis, Odeon and UCI. A fifth site was added with Warner Village, who fully funded and supported the system. In March, the first digital system in Asia was installed with Toho in Tokyo and quickly garnered record-setting attendance.



THE DLP PROJECTOR

The digital release of *Dinosaur* brought five new North American installations with AMC, Cinemex and General Cinema, including AMC Empire 25 Theatres in New York City—the first theatre in the world with two DLP Cinema projectors.

In July, six more European sites were added with Cinemas, Kinopolis, UCI and another self-funded Warner Village system. A second system was added in Japan with AMC, and the first digital theatre in Korea was installed with Seoul Cinema Town.

In summary, the year 2000 saw the addition of 19 digital screens, bringing the worldwide total to 31, with 16 theatre circuits in 10 countries (see accompanying list).

### RESULTS OF FIELD DEMONSTRATION PROGRAM

The objectives of the field demonstration were to demonstrate digital-cinema systems in real-world environments. This would allow us to study 1) moviegoer reaction to digital image quality, 2) digital movie and additional content creation and distribution issues, and 3) system reliability.

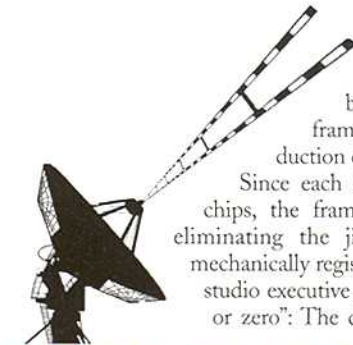
### DLP CINEMA PROJECTOR IMAGE QUALITY

The high-resolution field-demonstration projectors produce over four trillion color shades from a color palette very similar to that of film. The



BROOKE WILLIAMS





## DIGITAL CINEMA

### AUDIENCES LOVE DIGITAL PICTURES

A survey conducted by the SMU Cox School of Business polled 220 moviegoers who had just viewed Disney's live-action *Mission to Mars* in

high contrast ratio gives the digital images incredible dynamic range between dark shadows and the brightest highlights. Playback at 24 frames per second allows accurate reproduction of motion from film-based transfers.

Since each frame is projected from stationary chips, the frames are overlaid perfectly—thereby eliminating the jitter and weave associated with mechanically registered film projectors. Finally, as one studio executive confirmed, "You can't scratch a one or zero": The digital movie remains pristine from the first show through the last, accurately representing the creative intent of the filmmaker.

DLP Cinema technology.

• Seventy-four percent said that DLP Cinema picture quality (based on detail, color, clarity and brightness) is "much better" than film. Another 20 percent said it was "better" than film.

• Fifty-six percent would "definitely" go out of their way, and another 27 percent would "probably" go out of their way, to see a digital movie.

• Over 50 percent would "definitely" or "probably" attend a live sporting event, rock concert or educational event.

Theatre owner-sponsored survey results correlated closely with the SMU survey. Although the results are confidential, we can say that in most cases, attendance at digital showings exceeded film-based showings in multiple print venues—sometimes the figure was two to three times greater.

### THEATRE OWNER REACTION

Projectionists, who no longer have to thread film for each show, love the reliability and simplicity of the digital system. Theatre marketing organizations have embraced the technology and have leveraged the DLP Cinema brand to differentiate their digital theatres from local competition. Theatre management has welcomed testing of additional uses for their digital screens such as live broadcast or taped events, digital preview movie screenings and large group meetings. These new theatre uses are beginning to generate additional revenue during non-operational hours, turning traditional movie theatres into multi-purpose event centers.

Despite positive feedback from theatre owners, improvement opportunities have also been identified: the need for upgraded playback and distribution systems, which are being addressed early in 2001, and the need for consistent digital releases.

### DIGITAL MOVIE RELEASES

Studio releases in digital format increased substantially, resulting in a total of 12 titles released to DLP Cinema projectors during the year 2000 (see list). The recent start of digital releases from Sony, Miramax, Gaumont and Toci will augment the steady flow from Disney and Warner Bros., soon creating a constant supply of digital movies. We also expect other major studios to begin releasing in digital format during 2001. Looking into next year, Disney has publicly stated that their goal in 2002 is to release 100 percent of their movies in digital format.

Furthermore, a great deal has been learned about digital mastering techniques. New techniques and equipment will continue to improve the quality of digital mastering, thereby further enhancing the audience experience. These lessons learned have been captured in a mastering document

## PARTICIPATING THEATRES

### ... IN DLP CINEMA FIELD DEMONSTRATION PROGRAM

#### North America (16 locations, 17 screens)

AMC 1000 Van Ness; San Francisco, CA  
AMC South Barrington 30; South Barrington, IL  
AMC Empire 25 Theatres (2 screens); New York, NY  
AMC Mission Valley 20; San Diego, CA  
AMC Media Center 6; Burbank, CA  
AMC Pleasure Island 24; Lake Buena Vista, FL  
AMC Studio 30; Olathe, KS  
Cinemark at Valley View; Valley View, OH  
Cinemark at Legacy; Plano, TX  
Cinemex Mundo "E"; Tlanepantla, Mexico City, Mexico  
Edwards Irvine Spectrum 21 Megaplex; Irvine, CA  
El Capitan Theatre; Los Angeles, CA  
Famous Players Paramount; Toronto, Ontario, Canada  
Famous Players SilverCity Riverport; Richmond, B.C., Canada  
General Cinema Framingham 16; Framingham, MA  
Harkins Arizona Mills 24; Tempe, AZ

#### Europe (11 locations and screens)

Cinedom Köln; Köln, Germany  
Gaumont Aquaboulevard; Paris, France  
Kinopolis Brussels; Belgium  
Kinopolis Ciudad de la Imagen; Madrid, Spain  
Odeon Cinema, Leicester Square; London, United Kingdom  
UCI Cinesa Diagonal; Barcelona, Spain  
UCI Kinowelt Zoo Palast; Berlin, Germany  
UCI Kinowelt Düsseldorf; Düsseldorf, Germany  
UCI thefilmworks; Manchester, United Kingdom  
Warner Village, Star City; Birmingham, United Kingdom  
Warner Village, West End; London, United Kingdom

#### Asia (3 locations and screens)

AMC Ikspiari 16 at Tokyo Disney Resort; Tokyo, Japan  
Nichigeki Plaza Theatre; Tokyo, Japan  
Seoul Cinema Town; Seoul, Korea



DLP CINEMA SITES AROUND THE WORLD.



that is now the basis for the first worldwide digital-cinema release standard.

#### RELIABILITY

The reliability of these first digital-cinema systems and delivery processes is exceptional. To date, there have been no lost shows in digital theatres and no known ticket refunds from a digital showing. While a handful of glitches have occurred, technical lessons learned are leading to design and process changes that will further improve reliability.

## DIGITAL CINEMA

**SECURE TRANSPORT OF CONTENT**  
Distribution has been reliable and secure, demonstrating readiness for broad deployment. Technicolor has distributed the majority of the digital movies in a standard format on DVD-R or digital tape without breach of security. An exception to the disk or tape approach was the digital release of Miramax's *Bounce*, which was delivered via secure Boeing satellite and Williams Communications' fiber-optic network. Cisco and Qwest also demonstrated a secure Internet transmission system.

#### FUTURE PLANS

In 2001, the field-demonstration program will further our learning, offer opportunities to apply the technical lessons learned during the first year and continue to explore additional revenue generating uses for digital screens. Barco, Christie and Digital Projection are beginning to deploy their own interoperable projectors using DLP Cinema technology, expanding industry bandwidth for manufacturing and support of production systems. We expect to see the emergence of financing models based on equitable cost sharing between studios or distributors and theatre owners, along with further developments in secure satellite, fiber-optic and optical-disk distribution. With increasing digital releases to a worldwide standard, TI expects that, by the end of 2001, we will have begun the rapid deployment of digital-cinema systems around the world.

*DLP Cinema is a trademark of Texas Instruments. To learn more about DLP Cinema, visit their web page at [www.dlpcinema.com](http://www.dlpcinema.com).*

## DIGITAL MOVIES

### ... RELEASED ON DLP CINEMA PROJECTORS

Title	Studio/Distributor	Release Date
<i>Star Wars: Episode I</i>	Fox/LucasFilm	June 1999
<i>Tarzan</i>	Disney/Buena Vista	July 1999
<i>Toy Story 2</i>	Disney/Buena Vista	November 1999
<i>Bicentennial Man</i>	Disney/Buena Vista	December 1999
<i>Mission to Mars</i>	Disney/Buena Vista	March 2000
<i>Dinosaur</i>	Disney/Buena Vista	May 2000
<i>Fantasia 2000</i>	Disney/Buena Vista	June 2000
<i>Titan A.E.</i>	20th Century Fox	June 2000
<i>The Perfect Storm</i>	Warner Brothers	July 2000
<i>Space Cowboys</i>	Warner Brothers	September 2000
<i>Crimson Rivers</i>	Gaumont (France)	September 2000
<i>Very Mean Men</i>	Giants Entertainment	October 2000
<i>Bounce</i>	Miramax	November 2000
<i>102 Dalmatians</i>	Disney/Buena Vista	November 2000
<i>Nagasaki Bura Bura</i>	Toei (Japan)	December 2000
<i>Emperor's New Groove</i>	Disney/Buena Vista	December 2000
<i>Vertical Limit</i>	Sony/Columbia	January 2001
<i>Pay It Forward</i>	Warner Brothers	January 2001

# GREAT EXPECTATIONS, GREATER OPPORTUNITIES

By George D. Scheckel, Jr.  
QuVIS, Inc.

*"The more dedicated the asset, the more chance to be underutilized."*  
—Richard Parry-Jones, Ford Motor Company

In the last 20 months, at least 15 major feature films have been released digitally—to rave reviews. Reaction has been universally and overwhelmingly positive, coming from both theatre patrons and creative directors charged with maintaining both the production and distribution quality of the finished film. The verdict: Digital cinema looks and sounds great, and can be delivered at a higher quality than that of release prints.

The business of the movie and exhibition industries is about bringing people into an environment that provides an eye-opening presentation on a 30- to 50-foot screen. The best way to see a feature movie is, therefore, in a theatre that provides a high-quality image with excellent sound. Of course, an enthusiastic audience helps, too.



GEORGE D. SCHECKEL, JR.

Opportunities that enable new programming and revenue streams are rapidly emerging due to the improved presentation quality of digital cinema and the flexibility of the new digital theatre equipment. Digital-cinema programs should be embraced and promoted before the viewer escapes to his surround-sound home theatre.

Here's an example. In November 2000, QuVIS, Texas Instruments, Williams Communications, Boeing, Walt Disney, Miramax and AMC held a press event for the satellite transport of the feature film *Bounce*. During demonstrations that day, the theatre display system was used to display five different high-resolution formats, show film clips and HD video of the Super Bowl, and present segments from an Academy Awards show (courtesy of ABC). The demonstration was made possible by the versatility of the digital-cinema equipment.

The most glowing comments surrounding this event were reserved for the HD content, in particular the Super Bowl footage. Most of the audience had not previously seen high-resolution, non-film-originated content and were "blown away" by the experience.

One of the emerging opportunities in the cinema marketplace is the ability to use digital equipment to present *alternative* content, including: Broadway shows, musical concerts, sporting events, a broader slate of independent films and other new forms of entertainment. Companies are already forming to develop, aggregate and distribute new content, and will facilitate the migration from a *movie theatre* to an *entertainment center*.

A sampling of the interest in the digital-cinema market illustrates the inevitable result of this combination of technology, content and revenue sharing: more content available to all of us, from both traditional and new players.

- AMC Theatres and TVN hooked up last year to present the Red Hot Chili Peppers in concert.
- Edwards Theatres created the Edwards Cinematique Theatre to highlight classic and independent film distribution.
- Madstone Films will use its emerging "Digital Distribution Network" to feature localized, customized programming for music, fashion, sports and other professional content.
- Barry Rebo and Giovanni Cozzi have teamed up to launch "Emerging Cinemas," to establish a theatre network to distribute digital content to existing performing arts and cultural centers.
- Broadway Television Network has announced their plans to present *Jekyll & Hyde* in seven to 11 digital theatres on March 10 of this year. This distribution product, called "Broadway Cinema," will allow consumers throughout the country to experience the Broadway presentation in high-



resolution with extraordinary sound.

In order for theatre owners to benefit from ancillary revenues linked to d-cinema conversion, the industry must fulfill three requirements:

- There must be the availability of compelling content in digital format.
- The content must be high-resolution (of excellent production value, not just closed-circuit standard-definition television).
- Pricing strategies, revenue sharing and marketing engines must be established to achieve maximum market penetration for new types of programming.

## DIGITAL CINEMA

The good news is that all of these challenges can be met. Entrepreneurial exhibitors, studios and new entrants in the market are enabling this now.

Among the goals at QuVIS is to create affordable high-performance systems for theatrical releases and, soon, live events. This is also true of other manufacturers. System costs will come down. Costs for program

storage and transport will continue to drop on a "per-byte" basis. Those who adopt first will drive the market opportunities while they amortize the costs.

Availability of 24P digital cameras and extremely fast computing power for CGI (comput-

er-generated imagery) and even traditional animation is opening the door for creative people to produce very high-resolution digital content now. Film-resolution content will be here in the next 12 to 24 months, which can be quickly and cost-effectively distributed both to the systems in place now and to new adopters.

Film production and distribution costs won't go away, they'll plummet. And when they do, more people will create and distribute digital content.

Here's another example: Traditionally, an independent filmmaker with a finished product would pay \$1,500 to \$2,000 per copy to create distribution film prints for the 31 locations where the industry currently has digital cinemas. This means a total cost of \$46,500 to \$62,000 over and above the production cost of the content. If, instead, the film were distributed digitally, using a 60GB Exabyte data tape, the cost would be \$100 per copy—or just over \$3,000 for all 31 sites today. Similar and, in some cases, greater potential savings exist when alternative means of digital distribution are utilized, such as DVDs, fiber/Internet or satellite transmission.

The studios are embracing digital *distribution* for many reasons. Digital *production* is already employed at some stage for the majority of major releases today. And digital *acquisition* is not far behind. Independent film producers are banding together to facilitate improved marketing and distribution. Exhibitors are working on ways to cooperatively market and present new offerings and share revenues. These structures will drive the conversion to digital at a much faster rate than is currently projected.

The ultimate benefactor is the audience, who can now be entertained in grand style and myriad ways. And we are that audience.

Richard-Parry Jones would approve.

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THE QUBIT