

The Development Background Between Leader LHF™ and REAL-D



A Revolution in Cinema

Josh Greer had an idea....and his idea would be powered by Digital Projection. His concept; to create a radical 3D system. This 3D system would work! It did not contain the problems associated with 3D of the past 80 years. The mechanical issues of locking two 35mm projectors together resulting in excessive picture jitter would be a thing of the past. Josh is indeed a very smart gentleman. Previously he was the head technical guru at Digital Domain Media Group, the special effects company founded in 1993 by James Cameron. The cinema industry was about to experience two epic changes during the dawn of the next century. Digital projection would within 10 years of its development spell the death knell for film prints, and as the new millennium opens, audiences would be thrilled with a vibrant new dimension of 3D, the creation of Josh Greer leading to a cinematic revolution.

*The Real-D Theater
Beverly Hills, California
114 Seats
186 Sq Meters / 2002 Sq ft*

*Equipped with LHF™
Blue Series Signal Processing
and DXMS™*



Image © Leader Cinema Systems, Inc

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The Early Tests

During November 2000, Leader Cinema installed the next generation LHF™ sound system in the Charles Aidikoff Screening Room located in the William Morris Screening Room in Beverly Hills California. This 53 seat screening room is a studio class facility which enables industry professionals to view productions with the identical degree of picture geometry and transparency as in the Quality Control rooms within the walls of the studios. Since the era of Digital Sound was now mature, being in use for over a decade, Leader Cinema Systems was well aware of the serious limitations on a global scale facing cinema operators and their under performing sound systems. The LHF™ system parameters were well defined by Leader during the mid 90's, with many installations completed in private screening rooms and studio production facilities.

In June 2000, Leader Cinema presented the first large scale production LHF™ system to the Los Angeles Section of the Society of Motion Picture and Television Engineers during their Summer Session held in North Hollywood. Over 800 studio professionals attended the outdoor event.

Within 2 weeks, the system had been in use at the Official Residence of the British Consul General in Hancock Park, Los Angeles for a cinema industry event. The Visual Effects Society immediately secured use of the system for two back-to-back events. The VFS Film Festival (closed event to industry professionals only) and the "*End of Days*" Special Effects seminar held during ShowBiz Expo at the Los Angeles Convention Center. Within 2 months, Leader Cinema had established a partnership with the Aidikoff Screening Room, and the LHF™ system was then installed during November 2000. The immediate recognition throughout the entire industry was that... "*THIS! Is the place to experience a movie!*" Josh Greer had another idea.... And phoned us to talk about it.

Josh and his financial partner Michael Lewis were in need of a premium screening room. Nearing the end of their engineering development, it was time to test the system in real life. We discussed the future of cinema, the digital technologies which were to displace film and the emergence of Alternate Content productions. It was a natural progression for the three organizations: Leader, Real-D and Aidikoff to become involved. In 2003, for the first time, a small select group witnessed for the first time the astonishing developments, which would propel competitors such as DOLBY Labs. into a competitive stance in wining pairs of eyes in the theater to watch a 3D movie.

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Auditory and Visual Perception

-3-

Based upon the research conducted during the mid to late 1990's into the mystery of Visual Perception and how the stimulus of Sound may have an effect upon ones notions of visual clarity, these early tests were conducted on 2D / flat screen images. The association between Leader and REAL-D now provided the ideal abilities to delve into the mysterious dimensions which we all except in everyday life...the natural space and impact upon ones body, vision and hearing stimulus across multiple dimensions.

It became readily apparent that the visual effect of 3D could become more spacious as either the bandwidth of the sound system was expanded, or the fidelity of the sound manipulated to become thinner sounding which detracted from the 3D spatial image. This tracked with our findings with 2D images. These same tests revealed a critical element involving the "Surround Channels". Where traditional surround speakers are applied, there is a tendency for the surrounds not to fuse or "marry" the transition between the Screen Main Channels with the surround ambience, there being a "jump-shift" in the transition. Statistically, the audience responses between our early tests for the Leader 3Dx™ surround array supported the more realistic spatial dimension of 3Dx™. The overall fidelity of the surrounds with the introduction of extending the bass performance below the typical 75 to 80 Hz roll-off of all surround systems and increasing the bandwidth down to 30 Hz resulted in a far more realistic side and rear experience as one might experience in real life. A Ferrari revving its engine behind you, out of your line of sight, has the power and deep sounds which one relates to as "the real thing" This same sound when reproduced through the small speaker systems in a traditional cinema setting will sound more like a mosquito than a high performance powerful car.

The REAL-D Demonstrations

Josh and Michael close allies. Josh had great concerns about the lacking quality of the sound track to support their demos. The thin sounding music, some in stereo, some music sequences in mono did little to enhance the amazing dimension of the Digital 3D images. Together Josh and Michael created new sound tracks, complete with a more immersive ambience and thanks to the vastly superior LHF™ Main Screen Channels over the very ordinary speakers to be found in a cinema, the Front Main Stage took on a realistic sound quality and spaciousness...arguably superior to a feature film.

Toward the end of 2003 due to the overwhelming success of REAL-D's developments resonating with studio heads, producers, financiers, cinema owners and non-industry study groups, Real-D was in need of a larger theater. They relocated to the Clarity Partners Building also in Beverly Hills, just a short mile away or 1.6 Kilometers.

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LEADER LHF™ Enhancements for REAL-D in Beverly Hills

The Clarity Partners Building is a prestigious building at the corner of N. Crescent Drive and Wilshire Boulevard in BH. The A+ building was built by PolyGram and the company had installed a 114 Seat 186 Sq Meters Screening Room some 23 years ago.

The existing sound system is typical of the large cinema systems offered during the mid to late 1980's. However, it sounds “dated” when compared to the stellar qualities that REAL-D had become accustomed to over the past 18 months using the Leader LHF™ system. Josh Greer consulted with Michael Leader prior to relocating to the Clarity Building as he was concerned with the lack luster sound....”what can we do??? We do not own the theater...we must do something and quickly” he said.

The Leader LHF™ system at the Aidikoff (technical specs follow with drawings) would have been the ideal for this room. However, no structural changes could be made to the screen area. Also, sufficient AC power was not available behind the screen to power the 14 amplifiers (34,000 watts) associated with the Main Screen Leader LHF™ Speaker array (5450 Lbs / 2477 Kgs)

The final decision was to enhance the existing sound system through the application of specialized Leader LHF™ signal processing, additional hardware which included dedicated Dolby Labs. products operating independently of the theaters 35mm film chain and dedicated Dolby Cinema processors. Leader made repairs and modified the existing system to modernize it for the digital era.

The LHF™ custom package is illustrated at the right.

From top to bottom the system includes:

- 1 Grey Panel digital AES/EBU input panel with SPDIF
- 2 Silver Panel: Leader DXMS4.8 Digital DSP Signal Processing
- 3 Black Panel: Dolby Labs. DP 564 Studio Processor
- 4 Blue Panel: Leader Summing Network
- 5 Blue Panel: Leader Summing Network and Aux Input
- 6 Grey Panel: COSI System Interface

Rear View





Leader BLUE LHF™ Signal-Processing along side Christie Digital 2000 Series D Cinema projectors

THIS PJ has Real-D, Z-Screen

Image © Leader Cinema

The REAL-D Clarity Partners Projection Booth

*LHF™ again supporting
all major events at the
Clarity Partners Screening Room,
Now the REAL-D Theater*

The remarkable results enabled REAL-D to continue in the tradition established in the use of the LHF™ system in the Aidikoff Theater. The combined match in visual “fidelity” and resolution

upon the screen together with the studio grade sound fidelity, results in a marriage where each dimension enhances the other. The first demonstration utilizing LHF™ was to James Cameron followed that same day to Mr. Roy Disney. Mr. Disney invested \$ 50 million with REAL-D. The rest is history, and Leader was there.



Michael V. Pealer