



DIGITAL IMMERSIVE GIANT SCREEN SPECIFICATIONS (DIGSS) V 1.2.a

A. Introduction

This is the second formal revision of the DIGSS 1.0 document that was the result of the Digital Immersive Screen Colloquium for Unified Standards and Specifications (DISCUSS), a three-day meeting organized by the White Oak Institute in Marblehead, MA, in June 2010. DISCUSS brought together a panel of 21 advisors, technical experts, and others involved in the giant-screen industry, plus 61 others who contributed via an online wiki site that was opened after the meeting. The original meeting was supported by a grant from the National Science Foundation.

The stated goal of DISCUSS was “to create specifications for immersive digital GS theaters that create a viewer experience as good as or better than the film-based GS theaters now in place in museums and science centers.”

The DIGSS process has followed the example of the Digital Cinema Initiatives, a research and development process funded by the major Hollywood studios to expedite the conversion of commercial motion picture exhibition from film to digital. DCI specified an open, non-proprietary system that met or exceeded the standards of image quality that 35mm analog film had achieved and established an encryption system that would prevent pirating and other unauthorized access to the studios’ films.

Like their counterparts in the conventional cinema industry, many in the giant-screen community were concerned that the digital conversion of GS theaters might damage the reputation of the entire industry if theaters installed digital systems that were substantially lower in quality than the film projectors they replaced. Experts from all segments of the business felt it was important that the unique features of giant-screen cinema be maintained in any digital system that replaced GS film projectors. DIGSS is the industry’s effort to codify those features, for the benefit of theaters, film producers and distributors, projector manufacturers, systems integrators, and all other stakeholders, including audiences.

By a unanimous vote on September 22, 2011, the board of the Giant Screen Cinema Association accepted the role of stewardship of DIGSS 1.0, with a goal of further developing the recommendations.

B. Background

The commercial cinema industry was able to delay large-scale digital conversion of its theaters, waiting until the DCI Specifications were released. DCI Specification version 1.0 was released in July, 2005. Deployment of digital projection in the giant screen cinema industry has taken a different path. Given the need for a staggered rollout of digital projection, giant screen theaters have not been able to wait for the DIGSS process to evolve.

Recognizing the complexities of and differences across large format theaters – both dome and flat screen – the GSCA’s technical committee in 2012 established a task force to build upon DIGSS 1.0 and to manage the development of DIGSS moving forward. The task force defines DIGSS to be an evolutionary document, building on advancements in digital projection technologies and enhanced by innovations presented at conferences, tradeshows, and demonstrations. Appendix “A” tracks the chronology of many of these events and their influence on DIGSS.

By design, DIGSS will not be mandatory or exclusionary. Instead, DIGSS will serve as a guide rather than a rule book. And, as stated, DIGSS will continue to be revised and updated as new technologies are introduced and new methods of using giant-screen theaters are developed.

C. Goals

The primary goals of DIGSS are:

1. To create standard digital delivery formats.

Like the DCI specs, one of the overarching goals of DIGSS is to establish specifications for digital media encoding formats for programs shown in GS theaters, including resolution, contrast, frame rate, color space, audio channels, and more. Standardized digital delivery formats will simplify distribution and provide consistent quality for all programs intended for playback in these theaters.

2. To create theater quality specifications.

Also like the DCI Specification, DIGSS establishes technical requirements and specifications for digital GS theaters, including screen brightness, screen characteristics, speaker placement, theater layout, and more. Establishing these standards will help ensure consistently high-quality audience experiences.

3. To grow the market.

DIGSS will help create an open-access global network of compatible giant, immersive theaters large enough to support viable production of films intended primarily for those theaters.

D. The GSCA Giant-Screen Specifications

In September 2009, the Giant Screen Cinema Association adopted the following specifications defining a “giant-screen theater.” Giant-screen theaters

- Have flat screens that are at least 70 feet (21.3 meters) wide, or 3,100 square feet (288 square meters) in total area and place all seating within one screen width of the screen plane, or
- Have dome screens that are at least 60 feet (18.3 meters) in diameter.

The DIGSS Specifications incorporate these characteristics as recommended, while recognizing that some theaters do not meet them.

E. Changes In DIGSS 1.2

DIGSS 1.2 makes relatively modest changes to the values of several specifications in Section 1 to reflect the latest advances in technology (e.g., laser-illuminated projection and object-based sound systems) and to accommodate other known practical technologies that may become economically viable in the next few years.

Specifically, changes have been made to the sections on dome resolution, 3D peak white luminance, narrow-angle luminance uniformity, 3D ghosting, and audio channels. The sections on white chromaticity and colorimetry have been renamed “Color Gamut” and reference made to the Rec. 709 (acceptable) and Rec. 2020 (recommended) standards.

All other elements of DIGSS 1.1 are unchanged.

F. Changes In DIGSS 1.1

The DISCUSS process and the DIGSS 1.0 document had an ambitious scope and a set of goals that its participants recognized were probably too broad ever to be fully realized. In light of subsequent events, DIGSS 1.1 scales down the scope of the specs to technical aspects of digital image and audio file formats and theater design.

DIGSS 1.0 specified a 1.33:1 (also referred to as 4:3) aspect ratio, reflecting the industry’s long history with 15/70 and other film formats that used that ratio. Since most digital theaters use DCI-compliant projectors, which have a 1.9:1 aspect ratio, DIGSS 1.1 does not specify a single aspect ratio, leaving that choice to producers and theater operators.

The center of DIGSS 1.1 is the V 1.1 Summary table, which outlines specifications in those areas, listing them as “Acceptable,” “Recommended,” or “Aspirational.” Acceptable refers to some early legacy systems. Recommended reflects specs which are generally achievable at present. Aspirational indicates possible future enhancements that would improve the GS experience even further.

G. Principles

The first fundamental requirement of the GS theater environment is creating an effective and satisfying immersive experience by filling the eyes and ears of the viewer with images and sounds

that convincingly evoke a specific time, place, and/or situation outside of the theater.

The second fundamental requirement is reducing viewers' awareness of the theater's structure and the technical systems that produce the experience.

These requirements generate several principles:

- The image shall be projected on a screen that fills the front wall of the theater in the case of flat screens, and the entire "ceiling" in the case of domes.
- The viewers shall be physically oriented toward the center of the screen in a manner that is as intimate, comfortable, and natural as possible.
- The sound system shall be robust, dynamic, and clear; the theater shall be insulated from external sources of sound.

THE SPECIFICATIONS

Note: Paragraph numbering below corresponds to the line numbering and column lettering in the DIGSS V 1.2 Summary Table that accompanies this specification. The table includes minimum and recommended values, as well as aspirational values that are desirable if and when technology development permits them.

Refer to DIGSS v. 1.0 for explanatory notes to some of the specifications below which have been omitted from this version for the sake of brevity.

I. IMAGE QUALITY

A. Flat Displays

1. **Aspect ratios** of 1.33:1 (“Four Three”) or 1.85:1 (“Flat”) are recommended.
2. **Horizontal image resolution.** Recommended horizontal resolution shall be 4096 pixels. Resolution of 2880 horizontal pixels is acceptable when overshooting a 4K 1.9:1-ratio image to fill the height of a 1.33-ratio screen. (All resolution specs assume square pixels.)
3. **Vertical image resolution.** Recommended vertical resolution shall be 3072 pixels (for 1.33 images) or 2160 (for 1.85 images).
4. **Frame rate.** The display shall be capable of refreshing unique image frames at 24 fps for 2D systems, and 48 fps for sequential-eye 3D systems. Recommended additional rates include 48 and 60 fps (2D), 96 and 120 fps (3D).
5. **Peak white luminance** shall not be less than 20 fL for 2D screens and 10 fL for 3D screens.
6. **Luminance uniformity.** The corner-to-center luminance uniformity shall not be less than 80%. (*Exceeds DCI specification.*)
7. **Narrow-angle luminance uniformity.** For systems that blend multiple projectors to form the giant-screen image, or that otherwise exhibit brightness variations over small angles, the image brightness uniformity across non-uniformities (worst-case peak-to-peak variation of brightness measured at three points along a line perpendicularly intersecting a nonuniformity/blend region) shall not be less than 95%. This specification applies to any image consisting of a uniform value of red, blue, and green components (full white, full black, gray, or uniform color) across the measurement area.
8. **Ghosting.** For 3D systems, crosstalk between eyes shall be less than 1%.
9. **Sequential-image contrast** shall not be less than 2,000:1. (*Exceeds DCI.*)
10. **Checkerboard (intra-frame) contrast** shall not be less than 150:1.
11. **Color Gamut** shall follow the specifications of the Rec. 2020 standard.
12. **Pixel structure** shall have a fill factor of no less than 85%. Fill factor is defined as the ratio of the active pixel area (the area with 90% of peak pixel luminance or greater) to the non-active area, as measured on the surface of the spatial light modulator or the surface of the screen.
13. **Contouring.** Images shall not exhibit any contouring (step in luminance) . (*DCI compliant.*)
14. **Color Deviation.** Images shall not exhibit color deviation from neutral gray. (*DCI compliant.*)

B. Alternative Flat Displays

1. **Aspect ratios** of 1.78:1 (“16:9”), 1.89:1, and 2.39:1 (“Scope”) are permitted to accommodate the full range of popular motion picture formats.
2. **Horizontal image resolution.** Recommended resolutions shall be 3840 pixels for 1.78-ratio images and 4096 pixels for 1.86- and 2.39-ratio images.
3. **Vertical image resolution.** Recommended resolutions shall be 2160 pixels for 1.78- and 1.89-ratio images and 1716 pixels for 2.39-ratio images.
4. **Frame rate.** The display shall be capable of refreshing unique image frames at 24 fps for 2D systems, and 48 fps for sequential-eye 3D systems. Recommended additional rates include 48 and 60 fps (2D), 96 and 120 fps (3D).
5. **Peak white luminance** shall not be less than 20 fL for 2D screens and 10 fL for 3D screens.
6. **Luminance uniformity.** The corner-to-center luminance uniformity shall not be less than 80%. (*Exceeds DCI*).
7. **Narrow-angle luminance uniformity.** For systems that blend multiple projectors to form the giant-screen image, or that otherwise exhibit brightness variations over small angles, the image brightness uniformity across non-uniformities (worst-case peak-to-peak variation of brightness measured at three points along a line perpendicularly intersecting a nonuniformity/blend region) shall not be less than 95%. This specification applies to any image consisting of a uniform value of red, blue, and green components (full white, full black, gray, or uniform color) across the measurement area.
8. **Ghosting.** For 3D systems, crosstalk between eyes shall be less than 1%.
9. **Sequential contrast ratio** shall not be less than 2,000:1. (*Exceeds DCI*).
10. **Checkerboard (intra-frame) contrast ratio** shall not be less than 150:1.
11. **Color Gamut** shall follow the specifications of the Rec. 2020 standard.
12. **Pixel structure** shall have a fill factor of no less than 85%. Fill factor is defined as the ratio of the active pixel area (the area with 90% of peak pixel luminance or greater) to the non-active area, as measured on the surface of the spatial light modulator or the surface of the screen.
13. **Contouring.** Images shall not exhibit any contouring (step in luminance). (*DCI compliant.*)
14. **Color Deviation.** Images shall not exhibit color deviation from neutral gray. (*DCI compliant.*)

C. Dome Displays

1. **Aspect ratio.** For fulldome presentations, the aspect ratio shall be 1:1. Dome Master mapping shall be equidistant polar/azimuthal. This specification requires a simple spherical mapping between dome and digital image that deviates from the original Omnimax specification, which cannot accommodate mapping onto a full hemisphere. (*Compliant with Fulldome Master Show File specification, draft version 0.5.*)
For giant-screen presentations, the aspect ratio shall be 1.33:1, but because that is rectangular and does not conform to the shape of the dome, the image must be digitally warped into a portion of an equidistant polar/azimuthal image. The “active” image area of the warped fisheye frame should be at least 180 degrees wide by 130 degrees high to

approximate the distortion of an optical fisheye lens and the coverage of an IMAX Dome 15/70 projector.

2. **Horizontal resolution** (i.e., east-to-west) for fulldome presentations shall be 6000 pixels, with a minimum of 4096 pixels. Horizontal resolution for giant-screen presentations shall be 4096 pixels.
3. **Vertical resolution** (i.e., south-to-north) for fulldome presentations shall be 6000 pixels, with a minimum of 3600 pixels. Vertical resolution for giant-screen presentations shall be 3072 pixels.
4. **Frame rate.** The display shall be capable of refreshing unique image frames at 24 or 30 fps for 2D systems and 48 and 60 fps for sequential-eye 3D systems. Recommended additional rates include 48 and 60 fps (2D), 96 and 120 fps (3D).
5. **Peak white luminance** shall not be less than 4 fL, as measured at a 45-degree elevation above the center front dome bottom, on a dome with gain of between 0.35 and 0.5. The luminance specification is based on a screen gain of 0.4.
6. **Luminance uniformity.** The edge-to-center luminance uniformity over the screen surface shall not be less than 80%. (*Exceeds DCI.*)
7. **Narrow angle luminance uniformity.** For systems that blend multiple projectors to form the giant-screen image, or that otherwise exhibit brightness variations over small angles, the image brightness uniformity across non-uniformities (worst-case peak-to-peak variation of brightness measured at three points along a line perpendicularly intersecting nonuniformity/blend region) shall not be less than 95%. This specification applies to any image consisting of a uniform value of red, blue, and green components (full white, full black, gray, or uniform color) across the measurement area. This specification can apply to edge-blends and to dome screen issues with dust collection in perforations, except over support ribs.
8. **Ghosting.** For 3D systems, crosstalk between eyes shall be less than 1%.
9. **Sequential-image contrast** shall not be less than 2000:1.
10. **Checkerboard (intra-frame) contrast** shall not be less than 10:1. (*Not DCI compliant.* This specification is very sensitive to dome screen reflectance and theater finishes. For example, a 12:1 checkerboard contrast is achievable with a screen reflectance of approximately 0.35 or less.)
11. **Color Gamut** shall follow the specifications of the Rec. 2020 standard.
12. **Pixel structure** shall have a fill factor of no less than 85%. Fill factor is defined as the ratio of the active pixel area (the area with 90% of peak pixel luminance or greater) to the non-active area, as measured on the surface of the spatial light modulator or the surface of the screen.
13. **Contouring.** Images shall not exhibit any contouring (step in luminance). (*DCI compliant.*)
14. **Color Deviation.** Images shall not exhibit color deviation from neutral gray. (*DCI compliant.*)

II. Digital Giant Screen Package

Program Transport. Transport refers to the movement, from the distributor to the theater, of the Digital Giant Screen Package (DGSP). This can be accomplished in many ways, such as physical media, Virtual Private Network (VPN), or satellite.

The DCI Specification's guidelines for the transport of digital cinema content are general, and applicable to all digital content, regardless of resolution, and with little specificity relative to formatting. As such, they are incorporated into DIGSS without revision.

Digital Giant Screen Package. The DGSP can use any of a number of formats, depending upon the theater configuration. Single-channel projection systems are typically used in flat-screen theaters and multi-channel systems are usually in domes, but DIGSS permits either kind of system to be used with either screen type.

Following the model of the DCI Spec, DIGSS aspires ultimately to provide an open and non-proprietary DGSP that will serve theaters of all configurations, and does so now to the extent that DCI-compliant DCPs/DGSPs are used by distributors and theaters. However, recognizing that no comparable open standard exists among digital dome theaters, DIGSS 1.2 accepts the existing multitude of proprietary fulldome formats. For these shows, producers must deliver a digital source master/dome master to the system vendor for processing to the distribution format required by the end theater users. (In some cases, theaters are able to "slice" dome masters in-house, without assistance by the vendor.)

A. Flat Displays: for single or dual projector (double stacked), 2D or 3D:

15. **File format.** Sequential image files (TGA, PNG, DPX, IMF, ACES, EXT, etc., for 1.33-ratio displays. *(Not DCI compliant.)* JPEG2000 for 1.85-ratio. *(DCI compliant.)*
16. **Compression.** No compression for 1.33-ratio displays. *(Not DCI compliant.)* JPEG2000 compression for 1.85-ratio. *(DCI compliant.)*
17. **Color bit depth.** 10 bits. *(DCI compliant.)*
18. **Bit rate.** 250 Mb/sec. *(DCI compliant.)*
19. **Color Gamut** shall follow the specifications of the Rec. 2020 standard.
20. **Master File Mapping Format.** TIFF Rev. 6.0. *(DCI compliant.)*
21. **Master File Mapping Channels.** 16 bits per X,Y,Z channel. *(DCI compliant.)*
22. **Master File Mapping Gamma.** 12 bit and 4-bit zeros. *(DCI compliant.)*
23. **Encryption.** Meets DCI specifications.
24. **Decoding.** Meets DCI specifications.
25. **Packaging.** Meets DCI specifications.

B. Alternative Flat Displays: for single or dual projector (double stacked), 2D or 3D:

15. **File format.** JPEG 2000. *(DCI compliant.)*
16. **Compression.** JPEG 2000. *(DCI compliant.)*
17. **Color bit depth.** 10 bits. *(DCI compliant.)*
18. **Bit rate.** 250 Mb/sec. *(DCI compliant.)*
19. **Colorimetry.** The color encoding of the Digital Giant Screen Package embodies a device-independent, X'Y'Z' color space as described in CIE Publication 15:2004, Colorimetry, 3rd Edition. *(DCI compliant.)*
20. **Master File Mapping Format.** TIFF Rev. 6.0. *(DCI compliant.)*
21. **Master File Mapping Channels.** 16 bits per X,Y,Z channel. *(DCI compliant.)*
22. **Master File Mapping Gamma.** 12 bit and 4-bit zeros. *(DCI compliant.)*

23. **Encryption.** DCI compliant.
24. **Decoding.** DCI compliant.
25. **Packaging.** DCI compliant.

C. **Dome Displays:** for multiple-projector systems:

15. **File format.** Sequential master frames in JPEG, TGA, or PNG format for each channel.
(*Not DCI compliant.*)
16. **Compression.** Sequential. (*Not DCI compliant.*)
17. **Color bit depth.** 10 bits. (*DCI compliant.*)
18. **Bit rate.** N/A.

III. AUDIO SPECIFICATIONS

All Screens

26. **Channels.** The delivered digital audio, contained within the Digital Giant Screen Package (DGSP), shall support a minimum of 12 channels, with 16 channels recommended. (*DCI compliant.*)
27. **Bit depth** shall be 24 bits. (*DCI compliant.*)
28. **Sample rate** shall be 48 kHz or 96 kHz. Theater playback systems shall have the capability of performing sample rate conversion as needed. (*DCI compliant.*)
29. **Reference level** shall be -20 dBFS at an SPL of 85 dBc. (*DCI compliant.*)
30. **Center top speaker** in a dome theater shall be assigned audio channel 9. (*Not DCI compliant.*)

IV. THEATER ENVIRONMENT

“Reference seat” refers to the location of the eyes and ears of a viewer sitting on the centerline of the theater in a real or imagined seat exactly midway between the first and last rows of seats.

All screens

31. **Ambient interior and exterior noise** in the theater shall be less than Noise Criterion 25 (NC-25).
32. **Reverberation time** shall be less than 0.5 seconds in theaters with a screen less than 80 feet (24.4 meters) wide or a seating capacity of under 400. In theaters larger than this in size or capacity, reverberation time shall be less than 0.8 seconds.
33. **Intelligibility** produced by the theater’s audio system shall have an Articulation Loss of Consonants (ALCONS) of less than 5% and/or achieve a Speech Transmission Index (STI) rating of no less than 0.68 for the reference seat.
34. **Structural noise.** Neither the screen nor its support structure shall produce audible sound or sympathetic vibration in the presence of audio system energy of 105 dB at any frequency over a range of 20 Hz to 16,000 Hz, as measured at room center.
35. **Seating rake angle.** The plane of the seating area shall be angled to the horizontal plane no less than 12 degrees and no more than 30 degrees. It is recommended that the tilt be 20 degrees to 25 degrees.

36. **Reference eye point.** The eyes of the viewer in the reference seat shall be located above the bottom of the screen at a point between 0.28 and 0.33 times the height of the screen.
37. **Screen surface** shall be free from all visual defects, including scratches, dents, dirt, or any artifacts that can be detected by the human eye. The screen surface shall be spectrally neutral and free of visible specular reflections. The screen surface shall have a total variation of less than 2% in gain and color across its entire expanse.

A. Flat Screens

38. **Screen width.** The screen shall not be less than 70 feet (21.3 meters) or have a total area less than 3,100 square feet (285 square meters). (*GSCA GS spec.*)
39. **Screen height** shall not be less than 52.6 feet (16.0 meters) for a 1.33-ratio screen, or less than 37.8 feet (11.5 meters) for a 1.85-ratio screen. (*GSCA GS spec.*)
40. **Viewing angle.** No seat shall be located outside of the space defined in plan by two lines that begins at the screen centerline and extend 45 degrees from the centerline in either direction for 2D screens, and 35 degrees for 3D screens. (*GSCA GS spec.*)
41. **Closest seat position.** The eyes of the viewer in the center seat of the row closest to the screen shall not be closer than 0.33 times the width of the screen. (*GSCA GS spec.*)
42. **Farthest seat position.** The eyes of the viewer in the farthest seat from the screen shall not be farther than the width of the screen. (*GSCA GS spec.*)
43. **Broadest seat position.** No seat shall be located farther from the centerline of the theater than 0.45 times the width of the screen. (*GSCA GS spec.*)

B. Alternative Flat Screens

38. **Screen width.** The screen shall not be less than 70 feet (21.3 meters) or have a total area less than 3,100 square feet (285 square meters). (*GSCA GS spec.*)
39. **Screen height** shall not be less than 39.4 feet (12.0 meters) for a 1.78-ratio screen, less than 37.0 feet (11.3 meters) for a 1.89-ratio screen, or less than 29.3 feet (8.9 meters) for a 2.39-ratio screen.

C. Dome Screens

38. **Dome diameter** shall not be less than 60 feet (18.3 meters). (*GSCA GS spec.*)
39. **Minimum angular size.** For fulldome presentations, the dome and projection system shall display an image that is a minimum of 180 degrees in the vertical and horizontal fields of view. For 1.33 presentations, the image shall be a minimum of 130 degrees in the vertical field of view, with 20 degrees of that field below the horizon line of the reference seat and 110 degrees above it, and a minimum of 180 degrees in the horizontal field of view.
40. **Viewing angle.** Not applicable.
41. **Closest seat position.** The eyes of the viewer in the center seat of the row closest to a dome screen shall be no closer than 0.30 times the diameter of the dome. (*GSCA GS spec.*)
42. **Farthest seat position.** Not applicable.
43. **Broadest seat position.** No viewer's eyes shall be located within 4 feet (1.2 meters) of the inside edge, in horizontal plan, of the dome and/or dome lighting trough.
44. **Hemispherical integrity.** The dome's hemispherical characteristics shall exhibit a surface variance no greater than 1/2 inch (12.5 mm).

45. **Dome Seams.** The seams between the dome's constituent panels shall be invisible under full-color projection.

For further information, please contact Tammy Seldon, Executive Director of the GSCA.

tammy@giantscreencinema.com

624 Holly Springs Rd, Suite 243, Holly Springs NC, 27540-9030

Phone: 919-346-1123; fax: 919-573-9100; cell: 703-855-3699

APPENDIX A – Chronology of Significant Events

- June 2010: DIGSS 1.0 resulted from the Digital Immersive Screen Colloquium for Unified Standards and Specifications (DISCUSS) panel held in Marblehead, MA.
- January 2011: Moody Gardens, in Galveston, TX, hosted the giant screen industry's first digital symposium, presenting among other things side-by-side comparisons of 4K digital projection and 15/70 film.
- September 2011: The GSCA Board voted to accept the role of stewardship of DIGSS.
- January 2012: Moody Gardens hosted a second digital symposium. Filmmaker, special effects pioneer, technology innovator and entrepreneur Douglas Trumbull presented his vision for the future of digital cinema during his keynote address.
- September 2014: As part of the GSCA's fall conference in Toronto, Canada, Christie Digital demonstrated a six-primary, dual-projector, laser-illuminated projection system in a Toronto area multiplex theater auditorium. Douglas Trumbull presented UFOTOG; 120fps 3D content (60fps/eye).
- October 2014: The Science Museum of Virginia, in Richmond, VA, hosted a demonstration of Evans & Sutherland's Digistar 5 fulldome system, with nominal 8K resolution. The presentation included side-by-side comparisons of 15/70 film and digital projection on a dome.
- January 2015: IMAX Corporation hosted a private demonstration of its next-generation 4K laser projection system at its first installation – The Cineplex Scotiabank IMAX theater in Toronto, Canada.
- April 2015: IMAX Corporation debuted its first IMAX laser projection system in the United States. The presentation was made on the 96' wide screen at the TCL Chinese Theater in Hollywood, CA.
- April 2015: At CinemaCon, in Las Vegas, NV, Dolby Labs and Christie Digital presented Dolby Vision, a laser-powered projection system with a contrast ratio of 1,000,000:1.
- September 2015: As part of the GSCA's fall conference in San Francisco, CA, the Metreon IMAX theatre hosted digital new films and films in production on IMAX's newly installed digital laser projection system. A demonstration of the capabilities of IMAX's digital laser projection was also held during the conference technical session.
- September 2015: As part of the GSCA's fall conference Dome Day at The Tech Museum of Innovation in San Jose, CA, Evans & Sutherland demonstrated an 8K digital fulldome system using its Digistar 5 system with a temporary installation of five Christie 4K projectors