

### GENERAL OVERVIEW:

Texas Instruments has developed DLP Cinema™ technology in collaboration with the movie industry since 1996. DLP Cinema™ technology consists of specialized equipment, processes and know-how that ensure accurate presentation from post-production to exhibition. The same DLP Cinema™ projector design that is used in the mastering process is also used in all DLP Cinema™ theatres to ensure consistent presentation of the creative vision. Specialized color processing and mastering processes developed by Texas Instruments enhance the image quality of each digital movie.

### FILM CAPURED SOURCE:

The movie is normally transferred from an inter-positive film element using a Philips Spirit DataCine® or Cintel C-Reality® film scanner. Color timing is normally modified using a DaVinci 2K color corrector.

### DIGITAL CAPTURED or COMPUTER GENERATED SOURCE:

The movie is normally transferred from digital source data generated by the applicable production facility directly to the distributed format with no intermediate film element. Color timing is normally modified using a DaVinci 2K color corrector.

### PROJECTOR RESOLUTION:

The DLP Cinema™ projector uses three TI Digital Micromirror Devices (DMD), each with an array of 2048x1080 microscopic aluminum mirrors for a total of over 6 million mirrors. For comparison, the imaging mirror array is within 1 mm of the size of a Cinemascope® film print image. The movie is projected through a normal lens for flat aspect ratio movies and an anamorphic projection lens for scope movies.

### PROJECTOR CONTRAST:

The DLP Cinema™ prototype projector produces a sequential contrast ratio of >1400:1

### PIXEL DATA:

The image data is stored at 10 bits/component (Y/Cb/Cr) in 4:2:2 format. Since the DMD is a linear display device (i.e., no gamma characteristic as does a CRT), the data is gamma corrected and converted to linear RGB data. Each DMD™ displays at least 15 bits/color, linear data.

### FRAME RATE :

The TI DLP Cinema™ prototype projector displays at the standard film rate of 24 frames/sec. Since the DMD is not scanned like a CRT but is a virtually continuous display device, the display can be driven at 24 fps with no objectionable flicker.

### SHUTTER RATE :

Unlike a film projector, DLP Cinema™ technology does not involve the use of a shutter. Since there is no film being mechanically pulled through a film gate, there is no need to douse the light. This results in a continuous flicker-free display and a more efficient use of the lamp output.

### SCREEN BRIGHTNESS and SHUTTER CONTROL :

DLP Cinema™ projectors use a standard film projector lamp housing. Standard 4.5 to 6 KW Xenon lamps are being used, depending on screen size, producing approximately 10,000 to 20,000 lumens. This yields a typical screen luminance of approximately 12 fL, which is roughly equivalent to the current Society of Motion Picture and Television Engineers (SMPTE) specification for nominal screen luminance of 16 fL. Greater than 75% brightness uniformity is achieved on screen.

### DATA STORAGE AND PLAYBACK :

The picture information is normally compressed and stored using a compression system produced by various digital cinema server manufactures. Current compression methods used in theatres today include MPEG2, QuVIS wavelet and Qualcomm ABSolute. A single standardized compression format will be required in the future to ensure worldwide compatibility.

### AUDIO :

The audio information is normally stored as six channel, 24-bit uncompressed PCM data for the feature.

