

House District 26

Senate District 12

THE TWENTY-SIXTH LEGISLATURE  
HAWAII STATE LEGISLATURE  
APPLICATION FOR GRANTS & SUBSIDIES  
CHAPTER 42F, HAWAII REVISED STATUTES

Log No: 37-C

For Legislature's Use Only

Type of Grant or Subsidy Request:

GRANT REQUEST - OPERATING

GRANT REQUEST - CAPITAL

SUBSIDY REQUEST

"Grant" means an award of state funds by the legislature, by an appropriation to a specified recipient, to support the activities of the recipient and permit the community to benefit from those activities.

"Subsidy" means an award of state funds by the legislature, by an appropriation to a recipient specified in the appropriation, to reduce the costs incurred by the organization or individual in providing a service available to some or all members of the public.

"Recipient" means any organization or person receiving a grant or subsidy.

STATE DEPARTMENT OR AGENCY RELATED TO THIS REQUEST (LEAVE BLANK IF UNKNOWN):

STATE PROGRAM I.D. NO. (LEAVE BLANK IF UNKNOWN):

1. APPLICANT INFORMATION:

Legal Name of Requesting Organization or Individual:  
HAWAII THEATRE CENTER  
Dba:  
HAWAII THEATRE  
Street Address:  
1130 BETHEL STREET, HONOLULU HI 96813-2201  
Mailing Address:  
1132 BISHOP STREET, STE. 1404, HONOLULU HI 96813

2. CONTACT PERSON FOR MATTERS INVOLVING THIS APPLICATION:

Name BURTON WHITE  
Title ARTISTIC DIRECTOR & GENERAL MANAGER  
Phone # (808) 791-1306  
Fax # (808) 529-8505  
e-mail BURTONWHITE@HAWAII.RR.COM

3. TYPE OF BUSINESS ENTITY:

- NON PROFIT CORPORATION
- FOR PROFIT CORPORATION
- LIMITED LIABILITY COMPANY
- SOLE PROPRIETORSHIP/INDIVIDUAL

6. DESCRIPTIVE TITLE OF APPLICANT'S REQUEST:

HAWAII THEATRE SEEKS REAL IMPACT  
FROM "UN-REEL" TECHNOLOGY:  
DIGITAL CINEMA RETROFITTING TO INCREASE CAPACITY  
AND MITIGATE OPERATING EXPENSES

4. FEDERAL TAX ID #:

5. STATE TAX ID #:

7. AMOUNT OF STATE FUNDS REQUESTED:

FY 2012-2013: \$ 667,897

8. STATUS OF SERVICE DESCRIBED IN THIS REQUEST:

- NEW SERVICE (PRESENTLY DOES NOT EXIST)
- EXISTING SERVICE (PRESENTLY IN OPERATION)

SPECIFY THE AMOUNT BY SOURCES OF FUNDS AVAILABLE AT THE TIME OF THIS REQUEST:

STATE \$ \_\_\_\_\_  
FEDERAL \$ \_\_\_\_\_  
COUNTY \$ \_\_\_\_\_  
PRIVATE/OTHER \$ \_\_\_\_\_

TYPE NAME & TITLE OF AUTHORIZED REPRESENTATIVE:

AUTHORIZED SIGNATURE

BURTON WHITE- ARTISTIC DIRECTOR & GENERAL MANAGER  
NAME & TITLE

27 JANUARY 2012  
DATE SIGNED

## **Application for Grants and Subsidies**

# **HAWAII THEATRE SEEKS REAL IMPACT FROM “UN-REEL” TECHNOLOGY: DIGITAL CINEMA RETROFITTING TO INCREASE CAPACITY AND MITIGATE OPERATING EXPENSES**

## **I. Background and Summary**

### **1. THE HISTORIC HAWAII THEATRE AND THE HAWAII THEATRE CENTER**

The historic Hawaii Theatre is a state-of-the-art 1,400 seat performance center with a 16,010 square foot footprint that is listed on both the State and National Historic Registers. It is owned and operated by the Hawaii Theatre Center, which also owns Nuuanu’s Austin, Pantheon, and McLean Buildings between Hotel and Pauahi Streets in Honolulu’s Downtown/Chinatown district.

The historic Hawaii Theatre has been a meeting place for residents, visitors, young people, the military, families, students, and the elderly and is celebrating its 90<sup>th</sup> Anniversary, “Hawaii 9-O,” during its 2012-2013 season. Subsequent to its renovation and re-opening in the mid-1990s, this Hawaii cultural landmark has been a beacon for urban revitalization, education, and entertainment in the Downtown/Chinatown urban core.

The historic Hawaii Theatre was opened in September 1922 as a “cinema palace” which could also feature live and legitimate entertainments by Consolidated Amusements. The first movie, shown on September 7<sup>th</sup> was “The Three Musketeers” starring Douglas Fairbanks, Jr. In July of 1929, the Hawaii Theatre was the first theatre in Hawaii to be wired for talking pictures and, in December of 1929, the first “talkie,” “Showboat” starring Laura LaPlante, was shown at the Hawaii Theatre. During the war years of 1941-45, the Hawaii Theatre and the five other theatres located in old Honolulu established Downtown/Chinatown as Honolulu’s entertainment center.

The Hawaii Theatre is currently the second largest proscenium performance facility in the state employing thirteen full time and 15 part-time staff members and has an annual operating budget for fiscal year 2011-12 of \$2.3M (subject to audit).

For the past 15 years the restored Hawaii Theatre has delivered unique and critical services to our community as it seeks to fulfill its mission to operate the Hawaii Theatre as a leading performance center in downtown Honolulu, to benefit the people of Hawaii and visitors to Honolulu by:

- providing a broad range of entertainment, cultural and educational experiences in a facility of recognized excellence.
- providing education opportunities for Hawaii's young people.
- promoting the redevelopment of downtown Honolulu and stimulating its use in the evening and on weekends.
- enhancing the quality of life in Honolulu.

Hawaii Theatre Center also uses live theatre to help educate students in grades K-12. In the five years since hiring its first education director, the Theatre’s formal education program has grown and now has

reached more than 44,500 Hawaii school children and their families with a series of reduced-cost, high quality student matinee and family productions that are designed to supplement the public school curriculum, a teen acting company, and a technical theatre apprenticeship program.

The Theatre also has:

- reversed urban decay, attracted new business investment and drawn both kamaaina and tourists to its once struggling neighborhood.
- helped to fill the arts education void in Hawaii public schools and enriched the lives and enhanced the learning of at least 7,500 school children each year.
- enabled hundreds of other non-profit groups to tell their own stories successfully by providing extensive technical assistance.
- helped to preserve traditional Hawaiian music and dance and nurtured local talent with its broad range of Hawaiian cultural programming.
- brought national honor to Hawaii when it was awarded Outstanding Historic Theatre Award 2005 from the League of Historic American Theatres and a National Preservation Award from the National Trust for Historic Preservation in 2006.
- committed to transparency, accountability, and integrity in managing its finances and finished each year (save one during the unprecedented economic downturn of FY2009) in the black.

Hawaii Theatre Center is a showcase for public/private partnership. The Hawaii State Legislature was a major partner in the restoration effort, having invested \$13.7 million of the \$32 million raised to save this cultural landmark. The State's investment has created jobs, added state tax revenues and preserved an important part of Honolulu's history.

## **2. GOALS AND OBJECTIVES OF THIS PROPOSAL**

The historic Hawaii Theatre is still outfitted with 16mm and 35mm film projectors, obsolete technologies that no longer meet minimum technological requirements of major studios. This fact, coupled with a lack of available operators in our island state, has required the Hawaii Theatre to discontinue cinema and film programming until the Theatre can be outfitted with a new digital projection system. The lack of adequate screening technology was the single impediment to having the Hawaii Theatre premiere the recent Hawaii-based film, "The Descendants," which has gone on to win awards for both the film and its stars.

To empower the historic Hawaii Theatre to continue its historic cinema mission; as well as its current missions of neighborhood revitalization, education, and entertainments; a new digital projection system is indicated. This design/build digital projection project would include the demolition/removal of the current 35mm and 16mm projectors, as well as the current film sound system; interior reconfiguration of the historic control booth; a new cinemascope picture screen, a digital projection system (including projector, alternative content processor, power supply, lens, media server, surge arrestor, D to A converter, power conditioner, scaler, touch panel, etc.); 3D Dolby ® technology; and a new, integrated, Dolby ® sound system.

**The goals of this project are:**

- To continue the fiscally responsible stewardship of the historic Hawaii Theatre.
- To commit to energy conservation and reduction of the Hawaii Theatre's utility, maintenance, and labor expenses and carbon footprint.
- To provide an increased film/cinema capacity for the Hawaii Theatre to better serve its patrons, clients, and the general public to offset a downturn in touring productions due to the

economy and increased competition.

- To provide a large, state-of-the-art digital cinema laboratory and showcase venue to support local and non-local filmmakers, film and animation students, film festivals, commercial studios, and the local television industry.
- To provide an increased programmatic option to increase use of the Hawaii Theatre and drive the local economy.
- To positively impact affordability and economic development by offering a state-of-the-art cinema facility to users locally, nationally and internationally.

**Objectives include:**

- Becoming the largest state-of-the-art cinema venue in the State of Hawaii.
- Increasing Hawaii Theatre cinema programming options and earned revenue by meeting new digital projection system requirements.
- Decreasing operating expenses by retrofitting obsolete, inefficient projection technologies with current digital projection technologies.
- Increasing Hawaii Theatre state-of-the-art projection manifest to decrease third party expenditures for Hawaii Theatre and clients presentations.
- Increasing national and international presenters' interests in bringing cinema programming to Hawaii by decreasing freight costs by locally providing state-of-the-art digital projection technologies in an internationally known landmark venue.
- Replacement of the 16mm and 35mm projection system and projection screen, and install 3D technology.

**3. PUBLIC PURPOSE AND NEEDS BEING SERVED**

As part of Hawaii Theatre Center's 501(c)3 nonprofit mission to provide a broad range of high-quality entertainment, this project will support Hawaii's growing film industry by providing a world-class, state-of-the-art venue for the screening of locally produced films as well as the presentation of national and international films and film festivals.

All types of performing arts groups, large and small, use this community asset regularly. They receive a full range of services, including technical equipment and extensive production assistance, marketing support, financial counseling, box office sales, trained volunteer ushers, and significantly reduced rental rates for non-profit organizations.

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To empower the historic Hawaii Theatre to continue its historic cinema mission; as well as its current missions of fiscal responsibility, neighborhood revitalization, education, and entertainments; a new digital projection system is indicated. This design/build digital projection project would include the demolition/removal of the current 35mm and 16mm projectors, as well as the current film sound system; interior reconfiguration of the historic control booth; a new cinemascope picture screen, a digital projection system (including projector, alternative content processor, power supply, lens, media server,

surge arrestor, D to A converter, power conditioner, scaler, touch panel, etc.); 3D Dolby technology; and a new, integrated, Dolby sound system.

The ability to accommodate and present a wide range of entertainment and performing arts forms ensures that the historic Hawaii Theatre remains a vibrant member of our community and continues to serve as a centerpiece for downtown/Chinatown revitalization.

#### **4. TARGET POPULATIONS TO BE SERVED**

The historic Hawaii Theatre is a showcase for public/private partnership. The Hawaii State Legislature has been a major partner in the restoration effort, having invested \$13.7 million of the \$33 million raised to date to save and maintain this cultural landmark. The State's investment has created jobs, added state tax revenues and preserved an important part of Honolulu's history.

All types of performing arts groups, large and small, use this community asset regularly. They receive a full range of services, including technical equipment and extensive production assistance, marketing support, financial counseling, box office sales, trained volunteer ushers, and significantly reduced rental rates for non-profit organizations.

Target populations of this project include, but are not limited to:

- Hawaii residents, primarily on Oahu, as well as visitors to Oahu.
- Local filmmakers and presenters.
- Film festival organizers.
- UH Manoa Academy for Creative Media.
- Hawaii's diverse cultural population by promoting cinema events in the Hawaiian, Japanese, Chinese, Korean, and Filipino languages.
- The business and shop owners in downtown Honolulu/Chinatown who benefit from a vibrant cultural and entertainment scene in their neighborhood.

#### **5. GEOGRAPHIC IMPACT**

The project will benefit all the people of Hawaii; benefits are not limited to a specific geographic area, but will be most keenly felt by Oahu residents. Neighbor Island filmmakers present cinema events at the Theatre and Hawaii Theatre often partners (technology allowing) with local film festivals, and presents its own cinema events. The Hawaii Theatre also partners with national/international cinema partners and has often featured programming in the Japanese, Chinese, Korean, and Filipino languages.

The impact of the Hawaii Theatre is largest locally with a database of over 190,000 individual users, mostly on O'ahu, but with others users found on every major Hawaiian island, as well as the U.S. mainland, Japan, Germany, Korea, China, the Philippines and Europe.

The economic impact of the historic Hawaii Theatre reaches both performers and presenters in a similar manner, but is concentrated in our Downtown Arts District and Downtown/Chinatown.

## **II. Service Summary and Outcomes**

### **1. SCOPE OF WORK, TASKS AND RESPONSIBILITIES**

#### **SUMMARY**

The Hawaii Theatre Center has identified, through strategic planning and review, areas of Hawaii Theatre operations that require critical address to maintain the facility as a viable, state-of-the-art venue; and to assist the historic Hawaii Theatre Center in creating more sustainable operations to remain competitive in these times of redefining the “new normal” of the current economic environment.

With attendance, earned revenue and community support negatively impacted by the current economic climate, the need to increase capacity and reduce operational expense is critical and immediate.

The historic Hawaii Theatre is still outfitted with 16mm and 35mm film projectors, obsolete technologies that no longer meet minimum technological requirements of major studios. This fact, coupled with a lack of available operators in our island state, has required the Hawaii Theatre to discontinue cinema and film programming until the Theatre can be outfitted with a new digital projection system. The lack of adequate screening technology was the single impediment to having the Hawaii Theatre premiere the recent Hawaii-based film, “The Descendants,” which has gone on to win awards for both the film and its stars.

To empower the historic Hawaii Theatre to continue its historic cinema mission; as well as its current missions of neighborhood revitalization, education, and entertainments; a new digital projection system is indicated. This design/build digital projection project would include the demolition/removal of the current 35mm and 16mm projectors, as well as the current film sound system; interior reconfiguration of the historic control booth; a new cinemascope picture screen, a digital projection system (including projector, alternative content processor, power supply, lens, media server, surge arrester, D to A converter, power conditioner, scaler, touch panel, etc.); 3D Dolby technology; and a new, integrated, Dolby sound system.

### **CRITICAL CONCERNS**

- The major areas of Hawaii Theatre operations that were identified as being critical concerns and needing immediate attention were:
- The national and international cinema industry has gone through a significant technological shift to digital technologies.
- The need for technology retrofitting to address rising utility, maintenance, and labor costs.
- Electrical consumption that was reaching \$500,000 a year, and increasing.
- The need to revive the Hawaii Theatre’s historic cinema technical capacity to increase revenue and programming options to include: film study, art house and cultural programming, premieres, use by studio clients, and increasing audience.
- A growing dissatisfaction with the Hawaii Theatre’s obsolete 16mm and 35mm projections systems and mono sound system. The dissatisfaction; as voiced by patrons, local presenters and national/international presenters; requires them to locally source outside supplemental projection packages, or freight projection packages from outside Hawaii, adding to the already expensive proposition of doing business in the most remote area on the globe.
- Increased capacity will not only positively impact the Hawaii Theatre bottom line, but also the economy of the neighborhood through increased weekday Hawaii Theatre usage.

### **SCOPE OF WORK/ TASKS**

- Replace the outdated 16mm and 35mm projection system with a new, energy efficient, digital projection system featuring: a state-of-the-art, energy efficient, interoperable, 2K (upgradable to 4K) digital projector; 3D Technology; touch screen programming, and energy efficient lamps.
- Replace the outdated (1994) DOLBY® cinema sound system with a new, energy efficient, DOLBY® digital, surround sound system featuring:
- Replace the current motion picture screen with a new cinemascope projection screen.
- Reconfigure projection control booth.

**STATUS OF STRATEGIC PLANNING**

In 2010, Hawaii Theatre general management noted that film programming had all but suspended due to obsolete projection technologies, lack of qualified reel-to-reel projectionists, and the inability to meet the minimum standards of the current film industry.

In 2010, Hawaii Theatre general management began research on currently available digital technologies, the state of the digital projection industry, and the indicated systems necessary to once again become competitive in the cinema programming market.

In 2011, the Hawaii Theatre Center Finance Committee voted to recommend the commitment of funds to retrofit the Hawaii Theatre projection technology with digital technology.

In 2011, the Hawaii Theatre Center Board of Directors unanimously voted to support the retrofitting of the Hawaii Theatre projection system.

**ANTICIPATED RESULTS**

- Having the Hawaii Theatre join the quickly growing number of theatres world-wide to become a digital cinema facility.
- Becoming the largest state-of-the-art cinema venue in the State of Hawaii.
- Replacement of the 16mm and 35mm projection system and projection screen, and install 3D technology.
- Increased Hawaii Theatre cinema programming and earned revenue.
- Decreased operating expenses of digital projection system.
- Increased pool of available trained projectionists.
- Decrease third party expenditures for Hawaii Theatre and client projection presentations.
- Increased local, national and international presenters' interest in bringing cinema programming to Hawaii to an internationally-known, state-of-the-art cinema venue.

**2. PROJECTED TIMELINE FOR ACCOMPLISHMENT AND OUTCOMES**

The project schedule is dependent on grant approval and subject to change in deference to the Theatre's rehearsal/performance schedule. This project is green to go once grant approval notification is received.

|                        |                 |         |
|------------------------|-----------------|---------|
| Project Start          | July 2, 2012    | Day 1   |
| Vendors Contracted     | July 13, 2012   | 1 Week  |
| Equipment Ordered      | July 20, 2012   | 1 Week  |
| Equipment Received     | August 17, 2012 | 4 Weeks |
| Control Booth Demo     | August 17, 2012 | 3 Days  |
| Theatre Closure        | August 20, 2012 | 3 Weeks |
| Cinema Sound Retrofit  | August 20, 2012 | 3 Weeks |
| Control Booth Retrofit | August 20, 2012 | 3 Weeks |
| Picture Screen Rigged  | August 20, 2012 | 3 Weeks |
| Installations Complete | August 26, 2012 | 1 Week  |
| Systems Conditioning   | August 26, 2012 | 5 Days  |
| Punchlist Review       | August 31, 2012 | 1 Week  |
| Sign Off Start         | August 31, 2012 | 2 Weeks |

### **3. QUALITY ASSURANCE, EVALUATION PLANS, MONITORING, AND IMPROVING CAPACITY**

#### **Quality Assurance:**

The Hawaii Theatre Center has proven itself capable of managing major capitol projects. The restored historic Hawaii Theatre, its programming, and its management are testaments to the Hawaii Theatre Center's commitment to best practices in the areas of historic preservation, economic development, the education of youth, urban revitalization, fundraising, and serving the public. The Hawaii Theatre deals with reputable vendors and engages only licensed construction personnel.

#### **Monitoring:**

Monitoring will be done by Theatre and Facility Management staff using consistent analytic methodologies.

The Hawaii Theatre will monitor the results of digital cinema retrofitting by tracking:

1. Cinema Programming by:
  - a. Tracking the increase in cinema events.
  - b. Tracking the increase in cinema event patrons
  - c. Tracking the increase of cinema presenters using the Hawaii Theatre.
  - d. Tracking the increase of weekday/weekend cinema event usage.
  - e. Tracking increased earned revenue of cinema programming.
  - f. Tracking decreased expenses of cinema programming.
2. Electrical Consumption by:
  - a. Analysis of electric utility monitoring and bills.
  - b. Continuing Hawaii Theatre's participation in Hawaiian Electric's PowerTrax monitoring program that provides:
    - i. Real-time access to electrical consumption, in 15 minutes intervals
    - ii. Graphing historic/current usage comparisons
    - iii. Generating reports of consumption during specific activities.
3. Lamp Replacement by:
  - c. Logging initial projection lamp installation.
  - d. Logging projection lamp failures by date and usage.
  - e. Monitoring decrease of projection lamp replacement expenses and comparing it with previous lamp replacement expenditures.
4. Labor Costs by:
  1. Larger pool of available projectionists.
  2. Logging lamp replacement labor hours.
  3. Confirming life span of installed projection lamp elements.

#### **Evaluation:**

Evaluation will be done by Hawaii Theatre management through data collection/analysis of:

- Tracking the increase in cinema events.
- Tracking the increase in cinema event patrons



- Tracking the increase of cinema presenters using the Hawaii Theatre.
- Tracking the increase of weekday/weekend cinema event usage.
- Tracking increased earned revenue of cinema programming.
- Tracking decreased expenses of cinema programming.

### **Improving Capacity:**

Capacity will improve by;

- Having the Hawaii Theatre join the quickly growing number of theatres world-wide to become a digital cinema facility.
- Becoming the largest state-of-the-art cinema venue in the State of Hawaii.
- Replacement of the 16mm and 35mm projection system and projection screen, and install 3D technology.
- Increased Hawaii Theatre cinema programming and earned revenue.
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- Increased pool of available trained projectionists.
- Decrease third party expenditures for Hawaii Theatre and client projection presentations.
- Increased local, national and international presenters' interest in bringing cinema programming to Hawaii

#### **4. MEASURES OF EFFECTIVENESS REPORTED TO THE STATE EXPENDING AGENCY.**

The Hawaii Theatre will collect the following to provide a standard and objective methodology to assess the projects achievement/accomplishments:

- A comparison of the project's first year's cinema events with the same period in the year prior to installation.
- The number of patrons attending cinema events at the Hawaii Theatre.
- The number of projection lamps requiring replacement.
- The variance in the Hawaii Theatre's projection budget from the previous year.
- The number of cinema clients utilizing the Hawaii Theatre.
- The number and names of local nonprofits using Theatre digital projection equipment and the amount of any subsidy being provided to them by the Theatre.
- The total number and names of licensed cinema users for the Hawaii Theatre during the first year of the project.
- The increased number of HTC Presents cinema events.

### **III. Financial**

#### **Budget**

1. Overall budgets are contained herein on Budget Pages 4-6.

More detailed budget showing equipment, manufacturer's, types, quantities, MSRP, extended costs, labor, freight, and tax breakdowns are available in the Appendix (attached) on Page A-1.

2. Anticipated Quarterly Funding Requests for fiscal year 2012-2013.

| Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | Total Grant |
|-----------|-----------|-----------|-----------|-------------|
| \$333,949 | \$111,316 | \$111,316 | \$111,316 | 667,897     |

3. This project proposal is currently the only request for funding from the State of Hawaii for Fiscal Year 2012-2013.

## IV. Experience and Capability

### A. NECESSARY SKILLS AND EXPERIENCE

The Hawaii Theatre Center has an exemplary history of exhibiting the capacity, skills, knowledge, and experience necessary in taking on major capital projects; and consistent with local building codes and preservation standards, as provided by the U. S. Department of the Interior; in a fiscally efficient and responsible manner. Particular projects include:

- 1996- Completed \$21 million Hawaii Theatre interior restoration.
- 2005- Completed \$11.5 million Hawaii Theatre exterior renovation.
- 2006- Completed exterior renovation for Hawaii Theatre's Nu'uuanu Avenue properties, the "Austin" and "McLean" buildings.
- 2009- Completed \$600,000 Hawaii Theatre roof replacement.
- 2010- Completed \$1.08 million Hawaii Theatre HVAC (air conditioning) installation.
- 2011- Completed \$400,000 LED retrofitting, ADA enhancement, and concert sound systems.

### B. FACILITY

The historic Hawaii Theatre is a state-of-the-art 1,400 seat performance center with a 16,010 square foot footprint that is listed on both the State and National Historic Registers. It is owned and operated by the Hawaii Theatre Center, which also owns Nuuanu's Austin, Pantheon, and McLean Buildings between Hotel and Pauahi Streets in Honolulu's Downtown/Chinatown district.

The historic Hawaii Theatre has been a meeting place for residents, visitors, young people, the military, families, students, and the elderly celebrating its 90<sup>th</sup> Anniversary, "Hawaii 9-O," DURING ITS 2012-2013 season. Subsequent to its renovation and re-opening in the mid-1990s, this Hawaii cultural landmark has been a beacon for urban revitalization, education, and entertainment in the Downtown/Chinatown urban core.

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## **V. Personnel: Project Organization and Staffing**

### **A. PROPOSED STAFFING, STAFF QUALIFICATIONS, SUPERVISION AND TRAINING**

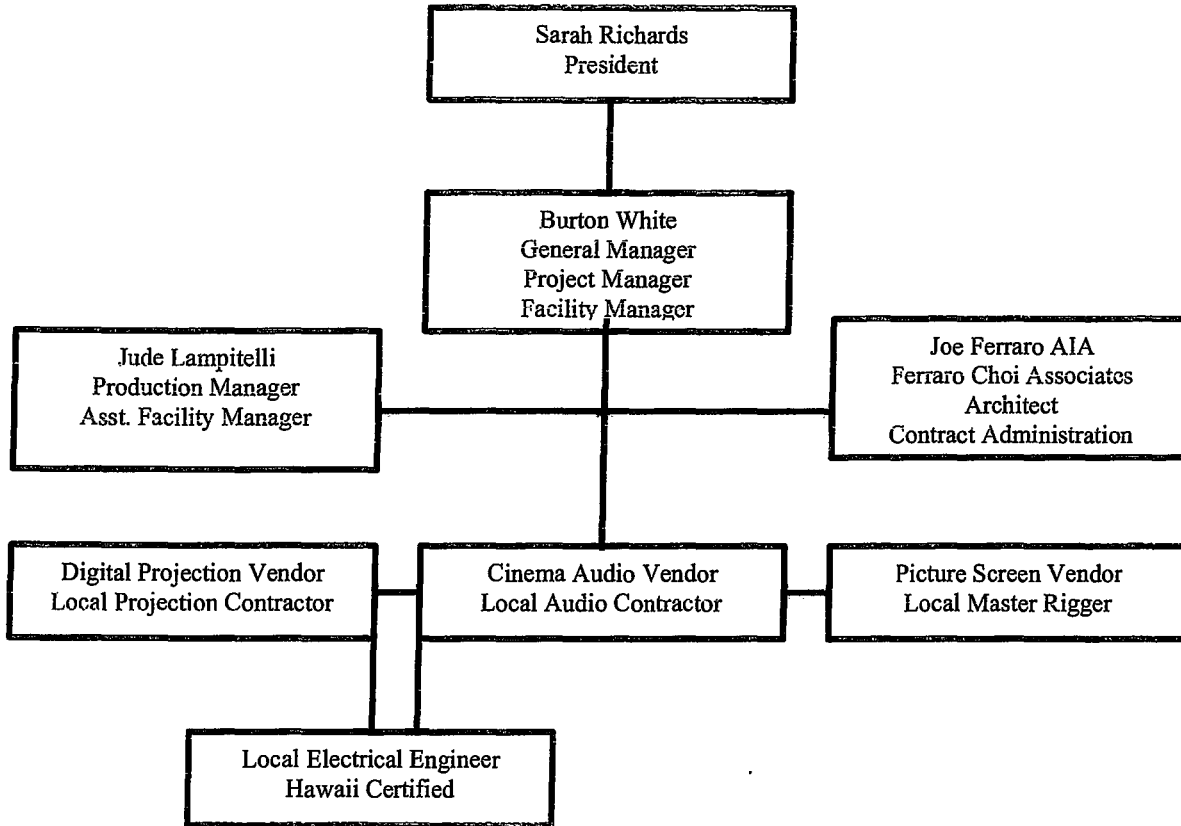
President Sarah M. Richards has served as CEO of the Hawaii Theatre Center since 1989 and oversaw the fundraising, restoration and renovation of the historic Theatre. She is responsible for the overall administration of the organization. Mrs. Richards was Executive Director of the State Foundation on Culture and the Arts and a founder of the Hawaii Opera Theatre. Nationally, her experience includes memberships on the Board of National Assembly of State Arts Agencies, the Western States Arts Federation, the National Endowment for the Arts Opera/Musical Theatre panel, the National Society of Arts & Letters, and currently sits as a director of the League of Historic American Theatres.

Artistic Director and General Manager, Burton White, will serve as project manager and select/approve products, vendors, and contractors. Mr. White has served as COO of the historic Hawaii Theatre since 1998 and has worked for Theatre since May of 1995. He was the onsite coordinator for the historic Hawaii Theatre interior restoration completion as well as the 1996 reopening, and provided coordination of the subsequent Hawaii Theatre exterior renovation, design/installation of the Theatre marquee, the installation of the roof in 2009, the installation of the 2010 HVAC project, and the 2011 LED Retrofitting, ADA Enhancement, and Concert sound system installations. He has been involved in professional theatre administration, production management, and theatre consultation for more than three decades and has held administrative and management positions at other theatres including the historic 3500-seat Stanley Theatre (now Pittsburgh's Benedum Center for the Performing Arts), the historic 1600-seat Fulton Theatre, and the historic 600-seat Stephen Foster Memorial Theatre at the University of Pittsburgh. He has served as the Executive Producer of California's Great American Melodrama & Vaudeville; Associate Director and faculty member of the Pittsburgh Playhouse Conservatory of the Performing Arts; the Director of Operations for the Honolulu Symphony; Founding Partner of Gargaro Productions (now Pittsburgh Musical Theatre, a professional Equity company and original member of the Pittsburgh Cultural Trust); and has produced, directed and stage managed hundreds of full-scale productions for both profit and non-profit theatres. Nationally, his experience includes memberships in the Actors' Equity Association, the organization that represents professional actors on Broadway and throughout the United States; the Association of Performing Arts Presenters; the Hawaii Arts Alliance; the Historic Hawaii Foundation; The Kennedy Center; the League of Historic American Theatres, the National Trust for Historic Preservation, The Smithsonian Institute, the Stage Managers' Association (regional representative), the Theatre Communications Group, and the United States Institute of Theatre Technology.

Production Manager, Jude Lampitelli has been with the Hawaii Theatre since 1998 and served as Stage Manager until 2006 when he was promoted to Production Manager and Assistant Facility Manager. He facilitated onsite coordination of the Hawaii Theatre exterior renovation, installation of the Theatre marquee, the installation of the roof in 2009, installation of the 2010 HVAC project, and the 2011 LED Retrofitting, ADA Enhancement, and Concert sound system installations.

### **B. Organization Chart**

## **HAWAII THEATRE SEEKS REAL IMPACT FROM "UN-REEL" TECHNOLOGY ORGANIZATIONAL CHART**



**VI. Other**

**A. LITIGATION**

The Hawaii Theatre Center has no outstanding litigation.

**B. LICENSURE OR ACCREDITATION**

The historic Hawaii Theatre is listed on the State and National Historic Registers, and a member of the League of Historic Theatres, the Association of Performing Arts Presenters, and the Hawaii Visitor & Convention Bureau.

- In 1997, the historic Hawaii Theatre was the Overall and Grand Hawaii Renaissance Award winner from the Building Industry Association of Hawaii.
- In 2005, the historic Hawaii Theatre was recognized as the “Outstanding Historic Theatre in America” by the League of Historic American Theatres.
- In 2005, the historic Hawaii Theatre received the Kukulu Hale Award of Excellence: Restoration Project from the National Association of Industrial & Office Properties, Hawaii Chapter.
- In 2006, the historic Hawaii Theatre received the National Preservation Honor Award, the National Trust for Historic Preservation’s highest preservation award.
- In 2006, the historic Hawaii Theatre won the Concrete Achievement Award for Concrete Structure Built Before 1940 and Still in Use given by the Hawaiian Cement Company.

- In 2006, the Hawaii Theatre Center was the first recipient of the Small Nonprofit category Torch Award for Business Ethics by the Better Business Bureau of Hawaii. They cited the historic Hawaii Theatre as a:


“financially successful--and drop-dead glamorous--performance venue that attracts more than 100,000 patrons annually,” saying its success has jump-started revitalization all over Chinatown, reversing decay and attracting reinvestment that has spruced up every building in the theatre's vicinity. More than 60,000 people now live in the area, and thousands more flock to the restaurants, stores and galleries that have sprung up since the theatre's reopening.”

- In 2007, the Hawaii Theatre was voted “Best Live Theatre” by the Honolulu Star Bulletin.

**BUDGET REQUEST BY SOURCE OF FUNDS**  
(Period: July 1, 2012 to June 30, 2013)

Appl

HAWAII THEATRE CENTER

| <b>BUDGET CATEGORIES</b>            | <b>Total State Funds Requested (a)</b> | <b>(b)</b>   | <b>(c)</b>     | <b>(d)</b> |
|-------------------------------------|--|--|----------------|------------|
| <b>A. PERSONNEL COST</b>            |  |  |                |            |
| 1. Salaries                         | N/A                                    |  |                |            |
| 2. Payroll Taxes & Assessments      | N/A                                    |  |                |            |
| 3. Fringe Benefits                  | N/A                                    |  |                |            |
| <b>TOTAL PERSONNEL COST</b>         | <b>N/A</b>                             |  |                |            |
| <b>B. OTHER CURRENT EXPENSES</b>    |  |  |                |            |
| 1. Airfare, Inter-Island            | N/A                                    |  |                |            |
| 2. Insurance                        | N/A                                    |  |                |            |
| 3. Lease/Rental of Equipment        | N/A                                    |  |                |            |
| 4. Lease/Rental of Space            | N/A                                    |  |                |            |
| 5. Staff Training                   | N/A                                    |  |                |            |
| 6. Supplies                         | N/A                                    |  |                |            |
| 7. Telecommunication                | N/A                                    |  |                |            |
| 8. Utilities                        | N/A                                    |  |                |            |
| 9                                   |  |  |                |            |
| 10                                  |  |  |                |            |
| 11                                  |  |  |                |            |
| 12                                  |  |  |                |            |
| 13                                  |  |  |                |            |
| 14                                  |  |  |                |            |
| 15                                  |  |  |                |            |
| 16                                  |  |  |                |            |
| 17                                  |  |  |                |            |
| 18                                  |  |  |                |            |
| 19                                  |  |  |                |            |
| 20                                  |  |  |                |            |
| <b>TOTAL OTHER CURRENT EXPENSES</b> |  |  |                |            |
| <b>C. EQUIPMENT PURCHASES</b>       | <b>667,897</b>                         |  |                |            |
| <b>D. MOTOR VEHICLE PURCHASES</b>   |  |  |                |            |
| <b>E. CAPITAL</b>                   |  |  |                |            |
| <b>TOTAL (A+B+C+D+E)</b>            | <b>667,897</b>                         |  |                |            |
| <b>SOURCES OF FUNDING</b>           |  | Budget Prepared By:  |                |            |
| (a) Total State Funds Requested     | 667,897                                | BURTON WHITE   | (808) 791-1306 |            |
| (b)                                 |  | Name (Please type or print)  | Phone          |            |
| (c)                                 |  |  | 1.27.12        | 40,935     |
| (d)                                 |  | Signature of Authorized Official   | Date           |            |
| <b>TOTAL BUDGET</b>                 | <b>667,897</b>                         | BURTON WHITE, ARTISTIC DIRECTOR & GENERAL MANAGER                                    |                |            |
|                                     |  | Name and Title (Please type or print)  |                |            |

## BUDGET JUSTIFICATION PERSONNEL - SALARIES AND WAGES

Applicant: HAWAII THEATRE CENTER

Period: July 1, 2012 to June 30, 2013

| POSITION TITLE  | FULL TIME EQUIVALENT | ANNUAL SALARY<br>A | % OF TIME ALLOCATED TO GRANT REQUEST<br>B | TOTAL STATE FUNDS REQUESTED<br>(A x B) |
|---|----------------------|--------------------|---|--|
| N/A   |                      |                    |   | \$ -                                   |
| [Please see "Justification/Comments" below]   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
|   |                      |                    |   | \$ -                                   |
| <b>TOTAL:</b>   |                      |                    |   |  |
| <b>JUSTIFICATION/COMMENTS:</b>  |                      |                    |   |  |
| THEATRE NOT SEEKING MONIES TO UNDERWRITE STAFF INVOLVEMENT IN THIS PROJECT. STAFF PROJECT PLANNING HAS BEEN COMPLETED OVER A TWO-YEAR PERIOD WITH TECHNOLOGIES, MANUFACTURER OPTIONS AND COMPETITIVE PROPOSALS CURRENTLY AVAILABLE. |                      |                    |   |  |

## BUDGET JUSTIFICATION - EQUIPMENT AND MOTOR VEHICLES

Applicant: HAWAII THEATRE CENTER

Period: July 1, 2012 to June 30, 2013

| DESCRIPTION<br>EQUIPMENT   | NO. OF<br>ITEMS                        | COST PER<br>ITEM | TOTAL<br>COST | TOTAL<br>BUDGETED |
|----------------------------|--|------------------|---------------|-------------------|
| Control Booth Retrofitting | [Please see Appendix (A-1) for detail] |                  | \$ 10,965.00  | 11200             |
| Digital Projection System  | [Please see Appendix (A-1) for detail] |                  | \$ 319,795.00 | 321355            |
| DOLBY® Cinema Sound System | [Please see Appendix (A-1) for detail] |                  | \$ 180,899.40 | 182580            |
| Motion Picture Screen      | [Please see Appendix (A-1) for detail] |                  | \$ 18,429.31  | 18750             |
| 3D Cinema Package          | [Please see Appendix (A-1) for detail] |                  | \$ 46,437.85  | 46794             |
| Contract Administration    | [Please see Appendix (A-1) for detail] |                  | \$ 26,178.00  | 26500             |
|                            |  |                  | \$ -          |                   |
| Contingency (10%)          |  |                  | \$ 60,718.00  | 60718             |
| (SEE NOTES FOR DETAIL)     | <b>TOTAL:</b>                          |                  | \$ 653,422.56 | 667,897           |

**JUSTIFICATION/COMMENTS:**

DETAILED BUDGET SPREADSHEET SHOWING PROJECT COMPONENT BREAKOUTS AND LABOR & FREIGHT COSTS AVAILABLE IN APPENDIX A-1 (ATTACHED); PRODUCT DESCRIPTIONS NOTED IN APPENDIX B-1 (ATTACHED). TAXES INCLUDED IN PRICING.

| DESCRIPTION<br>OF MOTOR VEHICLE | NO. OF<br>VEHICLES | COST PER<br>VEHICLE | TOTAL<br>COST | TOTAL<br>BUDGETED |
|---------------------------------|--------------------|---------------------|---------------|-------------------|
| N/A                             |                    |                     | \$ -          |                   |
|                                 | <b>TOTAL:</b>      |                     |               |                   |

**JUSTIFICATION/COMMENTS:**



**BUDGET JUSTIFICATION  
CAPITAL PROJECT DETAILS**

Applicant: HAWAII THEATRE CENTER

Period: July 1, 2012 to June 30, 2013

| FUNDING AMOUNT REQUESTED       |  |               |                       |                                  |                                      |              |
|--------------------------------|--|---------------|-----------------------|----------------------------------|--------------------------------------|--------------|
| TOTAL PROJECT COST             | ALL SOURCES OF FUNDS RECEIVED IN PRIOR YEARS |               | STATE FUNDS REQUESTED | OTHER SOURCES OF FUNDS REQUESTED | FUNDING REQUIRED IN SUCCEEDING YEARS |              |
|                                | FY: 2010-2011                                | FY: 2011-2012 | FY:2012-2013          | FY:2012-2013                     | FY:2013-2014                         | FY:2014-2015 |
| PLANS                          |  |               |                       |                                  |                                      |              |
| LAND ACQUISITION               |  |               |                       |                                  |                                      |              |
| DESIGN                         | 100000                                       |               | 333948                |                                  |                                      |              |
| CONSTRUCTION                   | 100000                                       |               | 333949                |                                  |                                      |              |
| EQUIPMENT                      |  |               |                       |                                  |                                      |              |
| <b>TOTAL:</b>                  | <b>200000</b>                                |               | <b>667,897</b>        |                                  |                                      |              |
| <b>JUSTIFICATION/COMMENTS:</b> |  |               |                       |                                  |                                      |              |

**DECLARATION STATEMENT  
APPLICANTS FOR GRANTS AND SUBSIDIES  
CHAPTER 42F, HAWAII REVISED STATUTES**

The undersigned authorized representative of the applicant acknowledges that said applicant meets and will comply with all of the following standards for the award of grants and subsidies pursuant to section 42F-103, Hawaii Revised Statutes:

- (1) Is licensed or accredited, in accordance with federal, state, or county statutes, rules, or ordinances, to conduct the activities or provide the services for which a grant or subsidy is awarded;
- (2) Comply with all applicable federal and state laws prohibiting discrimination against any person on the basis of race, color, national origin, religion, creed, sex, age, sexual orientation, or disability;
- (3) Agree not to use state funds for entertainment or lobbying activities; and
- (4) Allow the state agency to which funds for the grant or subsidy were appropriated for expenditure, legislative committees and their staff, and the auditor full access to their records, reports, files, and other related documents and information for purposes of monitoring, measuring the effectiveness, and ensuring the proper expenditure of the grant or subsidy.

In addition, a grant or subsidy may be made to an organization only if the organization:

- (1) Is incorporated under the laws of the State; and
- (2) Has bylaws or policies that describe the manner in which the activities or services for which a grant or subsidy is awarded shall be conducted or provided.

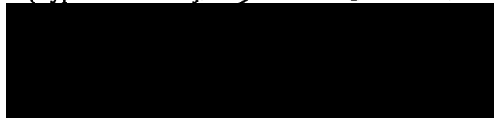
Further, a grant or subsidy may be awarded to a non-profit organization only if the organization:

- (1) Has been determined and designated to be a non-profit organization by the Internal Revenue Service; and
- (2) Has a governing board whose members have no material conflict of interest and serve without compensation.

For a grant or subsidy used for the acquisition of land, when the organization discontinues the activities or services on the land acquired for which the grant or subsidy was awarded and disposes of the land in fee simple or by lease, the organization shall negotiate with the expending agency for a lump sum or installment repayment to the State of the amount of the grant or subsidy used for the acquisition of the land.

Further, the undersigned authorized representative certifies that this statement is true and correct to the best of the applicant's knowledge.

HAWAII THEATRE CENTER  
(Typed Name of Individual or Organization)



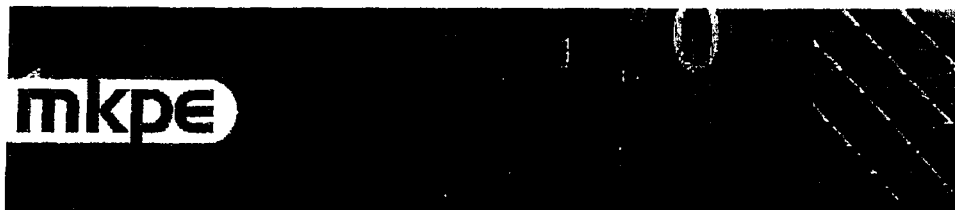
27 JANUARY 2012  
(Date)

BURTON WHITE  
(Typed Name)

ARTISTIC DIRECTOR & GENERAL MANAGER  
(Title)

**HAWAII THEATRE DIGITAL PROJECTION SYSTEM RETROFITTING**

|   | <u># OF ITEMS</u> | <u>MSRP/ITEM</u> | <u>EXTEND COST</u> | <u>TAXES</u><br>4.712% | <u>TOTAL COST</u> | <u>TOTAL BUDGETED</u> |
|---|-------------------|------------------|--------------------|------------------------|-------------------|-----------------------|
| <b>Control Booth Retrofitting</b>                                 |                   |                  |                    |                        |                   |                       |
| Demolition  | 1                 | \$ 1,570.68      | \$ 1,570.68        | \$ 74.01               | \$ 1,644.69       | \$ 1,700.00           |
| Optical Glass Window Revision                                     | 1                 | \$ 4,188.48      | \$ 4,188.48        | \$ 197.36              | \$ 4,385.84       | \$ 4,500.00           |
| Booth Reconfiguration   | 1                 | \$ 4,712.04      | \$ 4,712.04        | \$ 222.03              | \$ 4,934.07       | \$ 5,000.00           |
| <b>Sub-Total: Control Booth Retrofitting (All Inclusive)</b>      |                   |                  |                    |                        |                   | <b>\$ 11,200.00</b>   |
| <b>Digital Projection System</b>                                  |                   |                  |                    |                        |                   |                       |
| Christie Solaris Projector  | 1                 | \$ 179,004.00    | \$ 179,004.00      | \$ 8,434.67            | \$ 187,438.67     | \$ 187,600.00         |
| Alternative Content Processor                                     | 1                 | \$ 5,000.00      | \$ 5,000.00        | \$ 235.60              | \$ 5,235.60       | \$ 5,300.00           |
| Base (Power Supply)   | 1                 | \$ 2,000.00      | \$ 2,000.00        | \$ 94.24               | \$ 2,094.24       | \$ 2,100.00           |
| Lens  | 2                 | \$ 6,000.00      | \$ 12,000.00       | \$ 565.44              | \$ 12,565.44      | \$ 12,750.00          |
| Media Server  | 1                 | \$ 34,000.00     | \$ 34,000.00       | \$ 1,602.08            | \$ 35,602.08      | \$ 36,000.00          |
| Surge Arrestor  | 1                 | \$ 500.00        | \$ 500.00          | \$ 23.56               | \$ 523.56         | \$ 550.00             |
| D to A Converter  | 1                 | \$ 3,000.00      | \$ 3,000.00        | \$ 141.36              | \$ 3,141.36       | \$ 3,200.00           |
| Power Conditioner   | 1                 | \$ 1,000.00      | \$ 1,000.00        | \$ 47.12               | \$ 1,047.12       | \$ 1,200.00           |
| Scaler  | 1                 | \$ 2,500.00      | \$ 2,500.00        | \$ 117.80              | \$ 2,617.80       | \$ 2,700.00           |
| Touch Panel   | 1                 | \$ 1,600.00      | \$ 1,600.00        | \$ 75.39               | \$ 1,675.39       | \$ 1,700.00           |
| Netbook   | 1                 | \$ 500.00        | \$ 500.00          | \$ 23.56               | \$ 523.56         | \$ 550.00             |
| Installation Labor  | 1                 | \$ 34,300.00     | \$ 34,300.00       | \$ 1,616.22            | \$ 35,916.22      | \$ 36,205.00          |
| Calibration Labor   | 1                 | \$ 10,000.00     | \$ 10,000.00       | \$ 471.20              | \$ 10,471.20      | \$ 10,500.00          |
| Freight   | 1                 | \$ 10,000.00     | \$ 10,000.00       | \$ 471.20              | \$ 10,471.20      | \$ 10,500.00          |
| Consultant  | 1                 | \$ 10,000.00     | \$ 10,000.00       | \$ 471.20              | \$ 10,471.20      | \$ 10,500.00          |
| <b>Sub-Total: Digital Projection System (All Inclusive)</b>       |                   |                  |                    |                        |                   | <b>\$ 321,355.00</b>  |
| <b>DOLBY® Cinema Sound System</b>                                 |                   |                  |                    |                        |                   |                       |
| 4-Way Screen Speakers   | 3                 | \$ 4,116.00      | \$ 12,348.00       | \$ 581.84              | \$ 12,929.84      | \$ 13,000.00          |
| HF Array  | 1                 | \$ 2,614.00      | \$ 2,614.00        | \$ 123.17              | \$ 2,737.17       | \$ 3,000.00           |
| Subwoofers  | 8                 | \$ 1,694.00      | \$ 13,552.00       | \$ 638.57              | \$ 14,190.57      | \$ 14,200.00          |
| Surround Speakers   | 26                | \$ 603.00        | \$ 15,678.00       | \$ 738.75              | \$ 16,416.75      | \$ 16,500.00          |
| Wedges & Backplates   | 26                | \$ 147.00        | \$ 3,822.00        | \$ 180.09              | \$ 4,002.09       | \$ 4,100.00           |
| Horizontal Surrounds  | 20                | \$ 614.00        | \$ 12,280.00       | \$ 578.63              | \$ 12,858.63      | \$ 13,000.00          |
| Corner Mounts   | 2                 | \$ 54.00         | \$ 108.00          | \$ 5.09                | \$ 113.09         | \$ 115.00             |
| Horizontal Corner Mounts  | 2                 | \$ 54.00         | \$ 108.00          | \$ 5.09                | \$ 113.09         | \$ 115.00             |
| Digital Processor   | 1                 | \$ 4,472.00      | \$ 4,472.00        | \$ 210.72              | \$ 4,682.72       | \$ 5,000.00           |
| 18" DB-25 Cables  | 2                 | \$ 23.00         | \$ 46.00           | \$ 2.17                | \$ 48.17          | \$ 100.00             |
| Monitor   | 1                 | \$ 588.00        | \$ 588.00          | \$ 27.71               | \$ 615.71         | \$ 750.00             |
| Monitor Connection Boards   | 1                 | \$ 32.00         | \$ 32.00           | \$ 1.51                | \$ 33.51          | \$ 35.00              |
| 4' VGA Cables   | 1                 | \$ 9.00          | \$ 9.00            | \$ 0.42                | \$ 9.42           | \$ 15.00              |
| 6' VGA Cables   | 10                | \$ 9.00          | \$ 90.00           | \$ 4.24                | \$ 94.24          | \$ 100.00             |
| Monitor Selector Switch   | 1                 | \$ 110.00        | \$ 110.00          | \$ 5.18                | \$ 115.18         | \$ 125.00             |
| BGW Amplifiers  | 12                | \$ 970.00        | \$ 11,640.00       | \$ 548.48              | \$ 12,188.48      | \$ 12,200.00          |
| Transformers  | 2                 | \$ 131.00        | \$ 262.00          | \$ 12.35               | \$ 274.35         | \$ 325.00             |
| Installation Labor  | 1                 | \$ 50,000.00     | \$ 50,000.00       | \$ 2,356.00            | \$ 52,356.00      | \$ 52,500.00          |
| Calibration Labor   | 1                 | \$ 15,000.00     | \$ 15,000.00       | \$ 706.80              | \$ 15,706.80      | \$ 15,900.00          |
| Freight   | 1                 | \$ 20,000.00     | \$ 20,000.00       | \$ 942.40              | \$ 20,942.40      | \$ 21,000.00          |
| Consultant  | 1                 | \$ 10,000.00     | \$ 10,000.00       | \$ 471.20              | \$ 10,471.20      | \$ 10,500.00          |
| <b>Sub-Total: DOLBY® Cinema Sound System (All Inclusive)</b>      |                   |                  |                    |                        |                   | <b>\$ 182,580.00</b>  |
| Motion Picture Screen   | 1                 | \$ 8,800.00      | \$ 17,600.00       | \$ 829.31              | \$ 18,429.31      | \$ 18,750.00          |
| <b>Sub-Total: Motion Picture Screen (All Inclusive)</b>           |                   |                  |                    |                        |                   | <b>\$ 18,750.00</b>   |
| <b>3D Cinema Package</b>  |                   |                  |                    |                        |                   |                       |
| 3D DOLBY® System  | 1                 | \$ 18,848.16     | \$ 18,848.16       | \$ 888.13              | \$ 19,736.29      | \$ 19,794.00          |
| 3D Glasses  | 1500              | \$ 17.00         | \$ 25,500.00       | \$ 1,201.56            | \$ 26,701.56      | \$ 27,000.00          |
| <b>Sub-Total: 3D Cinema Package (All Inclusive)</b>               |                   |                  |                    |                        |                   | <b>\$ 46,794.00</b>   |
| Contract Administration   | 1                 | \$ 25,000.00     | \$ 25,000.00       | \$ 1,178.00            | \$ 26,178.00      | \$ 26,500.00          |
| <b>Sub-Total: Contract Administration</b>                         |                   |                  |                    |                        |                   | <b>\$ 26,500.00</b>   |
| <b>Sub-Total: Digital Projection Retrofitting (All Inclusive)</b> |                   |                  |                    |                        |                   | <b>\$ 607,179.00</b>  |
| Contingency (10%)   |                   |                  |                    |                        | \$                | \$ 60,718.00          |
| <b>TOTAL:</b>   |                   |                  |                    |                        | <b>\$</b>         | <b>\$ 667,897.00</b>  |



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## Digital Cinema in 2010 - a Mid-Year Report

by Michael Karagosian

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Digital cinema sales were moving at full speed as 2010 began. The pace was set in 2009 in anticipation of the 3D release of Avatar in late December. A doubling of digital projector installations took place, resulting in more than 16,000 digital cinema systems installed worldwide, half of which were 3D capable. Nearly all of the growth was in 3D capable screens. The chart in Fig. 1, courtesy of Screen Digest, illustrates the growth in digital screens by region.

D-Cinema screens by world region

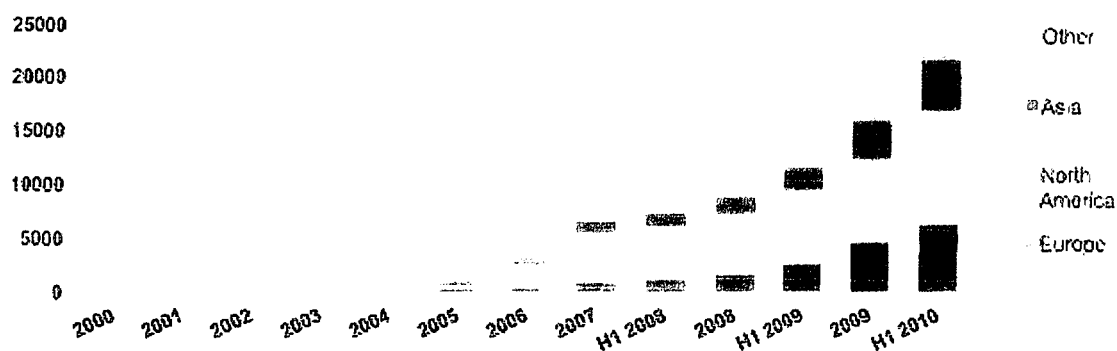


Figure 1. Growth in digital cinema worldwide.

Even as Avatar's box office began to decline, 3D continued to drive the conversion of cinemas to digital projection. The box office success of Avatar, and a pipeline of 3D releases, including blockbusters Alice and How to Train Your Dragon, led to more growth in sales. By end of the first half of 2010, the U.S. reached the 10,000 digital screen milestone. Continuing with the trend, nearly 50% of these are 3D capable. (see Fig. 2.)

## US Mid 2010 Digital Cinema Growth

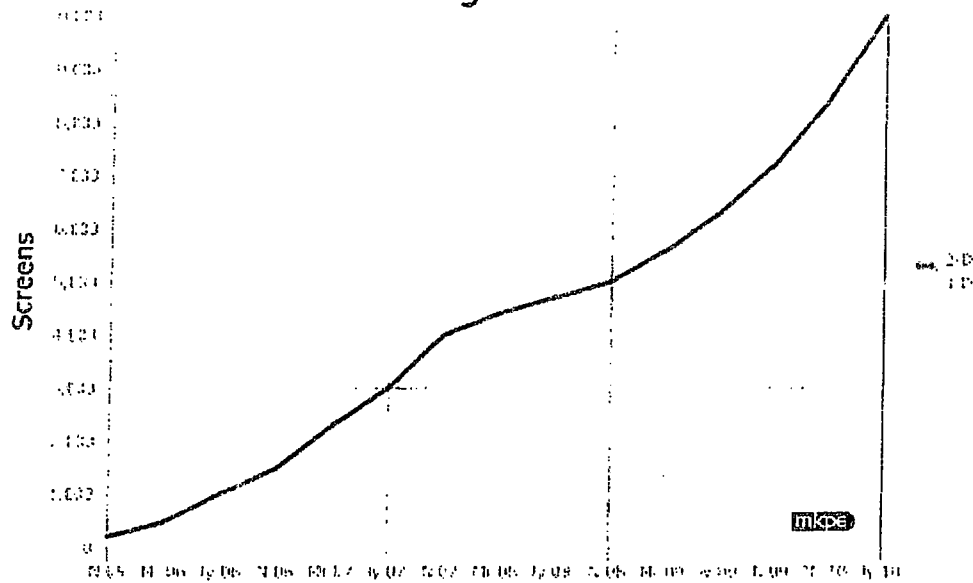


Figure 2. Growth in digital cinema in the U.S.

In March of 2010, U.S. deployment entity Digital Cinema Implementation Partners (DCIP) announced the completion of \$660 million in funding for the purchase of digital projection systems. DCIP is a joint venture of major cinema chains AMC, Cinemark, and Regal Entertainment. The financing will enable the digital conversion of approximately 10,000 of the collective 16,000 screens operated by these circuits. Conversion of the 10,000 screens is expected to complete by 2012.

Other milestones include the release-to-market of the Series 2 generation of Texas Instruments DLP Cinema projectors. With the introduction of Series 2, licensees Barco, Christie Digital, and NEC were able to proclaim DCI-compliant products by mid-year, the first time ever that any manufacturer's product had passed the DCI Compliance Test Plan.

The DCI specification is the cornerstone of digital cinema. It represents the intent of the six major studios to use common methods for the distribution of content and for maintaining the security of that content. DCI Compliance is mandated in equipment financing deals, and manufacturers actively strive to meet the specification.

However, a cloud was cast over the DCI specification in January by the U.S. National Institute of Standards and Technology (NIST). NIST is the organization responsible for the FIPS 140-x series of security standards, developed for "the utilization and management of computer and related telecommunications systems in the Federal government." As a core tenement of its security specification, DCI calls for compliance to FIPS 140-2. It has been known for several years that NIST planned to transition to a revised FIPS 140-3 specification. But the impact on the industry was not clear until the past year, when NIST incorporated changes to FIPS 140-2 through a revision of the standard's Annex A and through circulation of transition document NIST SP800-131.

With the new changes by NIST, the DCI specification was challenged in three areas:

- (1) SHA-1 Hash is no longer allowed for digital signatures, called for by both the DCI specification and SMPTE standards.
- (2) The method described in ANSI 9.31 cannot be used as a random number generator for generating content keys, as called for by DCI.
- (3) The key pair used for a digital signature cannot be used for other purposes. DCI requires the re-use of the media block key pair for AES key encryption in the KDM, for establishing TLS sessions, in addition to signing security logs.

In response to comments, NIST relaxed its call for a year-end transition for items (1) and (2), introducing a deprecation period of three and five years, respectively, for use of these algorithms. Among the many entities that requested extensions was the U.S. Department of Defense. However, only DCI requested to extend the time allowed for multi-use of the media block key pair, which unfortunately did not sway NIST. Unless NIST changes its mind by year end, multi-use use of the media block key pair will no longer be allowed after December 31, 2010, in FIPS 140-2-compliant equipment. Media blocks will be required to be redesigned to carry more than one digital certificate.

The new NIST rule raises a number of issues. Clearly, the changes imposed by NIST are outside of DCI's control. If no action is taken, the DCI specification will be in conflict with itself after December 31, rendering insignificant a document that is core to digital cinema. Among its options, DCI can render obsolete current equipment and continue to require FIPS approval, relax

its requirement for FIPS approval of equipment, or develop its own security specification that maintains the status quo in equipment design and is supported by a formal testing process.

Perhaps more pertinent is that an industry still in its infancy is unprepared to address obsolescence. Perhaps 20,000 screens have been converted out of a worldwide footprint of 150,000. Any move toward obsolescence today could trigger severe repercussions. But change is inevitable. NIST's actions were not capricious, but calculated to maintain an effective security standard in the face of advancing computational power. Even if DCI were to part ways with NIST, it would still be faced with the eventual upgrade of its security specification.

In the area of the more mundane day-to-day aspects of digital cinema, the industry continues to suffer operational problems with security key management. The DCI specification does not call for an effective means to manage security keys across a worldwide footprint of installations. SMPTE standardized the Facility List Message (FLM) for this purpose, but without a specification to require its use, there has been little or no implementation of it in the field. Studios and their vendors scramble to provide such management through whatever means available, including direct phone calls to each site. Still, some shows are lost due to the movement of equipment, poor management of security key information, or delay in getting the right keys to the right equipment. Ironically, the fast adoption of digital 3D projection, in which only a few screens per complex are often converted, has contributed to the magnitude of the problem.

In a world of sophisticated network-based communications, the primary means of delivery for Key Delivery Messages (KDMs) remains personal e-mail. Although this is an improvement over early snail-mailing of USB memory sticks, it is not an elegant solution. In an encouraging move, Mike Radford of Fox presented an open RESTful approach to FLM management to the Inter-Society Digital Cinema Forum (ISDCF). More work is needed, however, if open, automated communication of KDMs are to take place. The diagram in Fig. 3 illustrates the distribution workflow challenge in digital cinema.

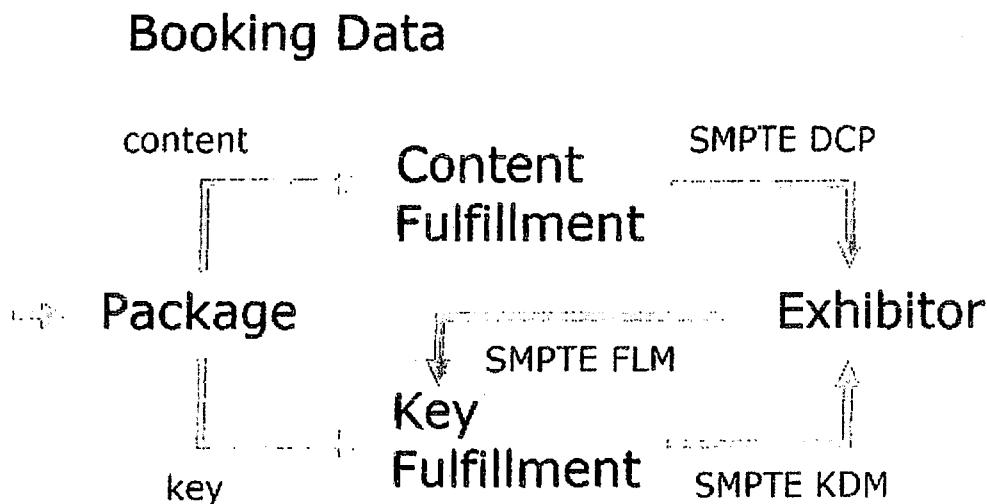


Figure 3. Distribution workflow in digital cinema.

After 11 years of developing standards, the industry is now beginning to incorporate them. Of primary value is the transition to "SMPTE DCP," the standardized distribution package. To aid in this effort, the ISDCF is conducting demonstrations and "plugfests" to bring manufacturers and fulfillment entities together to test their wares. Its efforts have been hugely successful, uncovering problems that otherwise would only be discovered in production. At least three such plugfests are planned for 2010, and possibly more in 2011, if necessary, to bring confidence to users.

The ISDCF effort has also been of tremendous value in testing accessibility systems. Accessibility continues to be a major focus across the industry, and SMPTE has played a significant role. In 2008, SMPTE standardized the distribution of closed captions with S428-10 DCDM Closed Caption and Closed Subtitle and S429-12 Caption and Closed Subtitle. In 2009, SMPTE successfully balloted S430-10 Aux Content Synchronization Protocol and S430-11 Aux Resource Presentation List, together describing an open protocol that enables third-party closed caption systems to connect to compliant digital cinema servers. In addition, S429-2 DCP Operational Constraints, published in 2009, identifies how hearing impaired (HI) and visually impaired narrative (VI-N) audio channels may be carried in compliant audio distributions. The support for accessibility in distribution and equipment standards is a first for the motion picture industry, eliminating the proprietary distributions and protocols found in film systems and encouraging much needed competition in accessible products.

But, as sometimes happens, there were surprises. The publication of 430-11, a key document in the server-to-system communication of closed captions, ran into a snag in early 2010. An error in S433 XML Data Types was found that affects several existing standards, including the then about-to-be-published S430-11. S433 normatively defines the DCML namespace name with a terminating "/". However, the original informative schema distributed with the S433 document did

not use the terminating "/" in its DCML namespace name. Developers that based their designs only on the S433 informative schema file found themselves in a pickle. In June 2010, the 21DC Technology Committee decided to stay the course and maintain the normative prescription for the DCML namespace name. The direction requires changes to several standards to amend their use of DCML, including S430-11. Manufacturers whose products incorporate the S433 DCML schema must be sure to use the normative DCML namespace name prescribed in S433.

Altogether, 2010 promises to be a watershed year for digital cinema. With the rollout of technology moving at a fast pace, the incorporation of SMPTE standards in products moving forward, the coming-to-market of the advancements in accessibility, and the challenges to be met by DCI, this will be a year to be remembered.

# Don't keep it reel: why there's life after 35mm

As digital takes over, many in the film industry are mourning the death of 35mm film after 120 years in the business. But it's time to move on to a far more flexible format

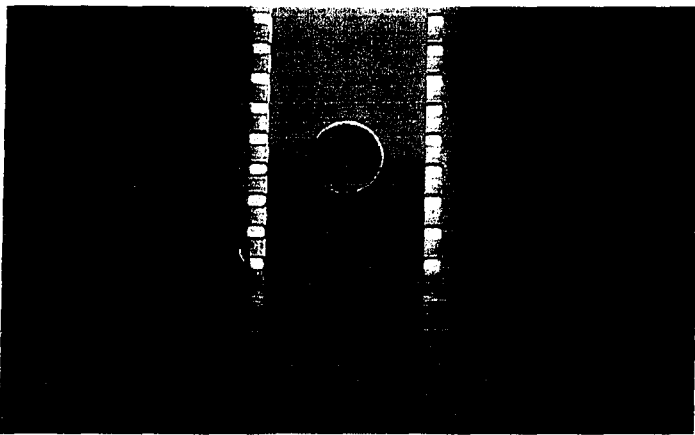
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Ivan Radford  
guardian.co.uk, Tuesday 29 November 2011 03:29 EST

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**A** [larger](#) | [smaller](#)  
[Article history](#)

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Fading film ... Tacita Dean's *Film* at Tate Modern's Turbine Hall pays homage to 35mm film. Photograph: Sarah Lee for the Guardian

After 120 years and countless movies, 35mm is officially on the way out. In January, 63% of the world's screens will be digital, [according to report from IHS](#). Last year, 67% of global screens were still 35mm. The year 2011 is the tipping point, when digital cinema replaces celluloid as the mainstream form of projection. It's the end of an era and the start of something new.

"Since 1889, 35mm has been the principal film projection technology," [David Hancock, head of film research at IHS, said this week](#). "However, after 10 years of market priming, movie theatres now are undergoing a rapid transition ... spurred initially by the rising popularity of [3D](#) films."

In 2009, James Cameron's *Avatar* convinced the industry that it was time for an upgrade. Studios scrambled to slap a 3D sticker on their film, which would earn them both a ticket uplift and novelty audience appeal. And so cinemas joined the move towards digital, automating a process that projectionists have spent years perfecting.

The impact is as far-reaching as it gets. The distribution and manufacturing of prints



has changed completely. In 2008, 13 billion feet of 35mm was used per year. Next year, 4 billion feet of celluloid will be used, as print production costs rise and films are sent out as files on USB sticks. The switchover is picking up speed. In America, the statistics warn, there will be no mainstream 35mm usage by 2014.

Many in the industry aren't happy. The New Beverly cinema in LA, which only shows 35mm film, has started a petition against the end of print distribution.

"Films that make up the glorious history of the art ... should be viewed as they were meant to be," it reads. At the time of writing, it has 4,380 signatures.

There's a lot of romanticising 35mm as a format. Tacita Dean's Film (at Tate Modern until March) perfectly captures its fragile, deteriorating beauty, using techniques dating all the way back to Georges Méliès. It's hard not to feel attached to a medium so steeped in nostalgia, but isn't digital better?

High-definition picture and sound have eclipsed the quality of celluloid. All the major films are now digital, if not 3D. Peter Jackson's The Hobbit and Ridley Scott's Prometheus are both using the Red Epic camera, with Jackson shooting in 48fps – double the standard frame rate of 35mm.

Even that master of cinematography, Roger Deakins, is shooting Skyfall, the next Bond film, on Red's rival, the Arri Alexa, according to the IMDb. If Deakins is doing it, surely digital's a good thing?

But even if you can accept the improvement in quality, and the reduction in human and mechanical error, digital's takeover has other casualties. With projectors now operated at the push of the button, projectionists are fading out from cinemas altogether. For the last few years, BECTU (the Broadcasting Entertainment Cinematograph and Theatre Union) has struggled to negotiate employment terms with major chains. Many projectionists are fired, or resign, while cinemas retain a handful as maintenance staff to perform other technical duties in between pressing "Play" and "Stop" on screenings of Alvin and the Chipmunks.

Without the watchful eye of a projectionist, things can still go wrong. Digital screenings can freeze, the sound can cut out – or in one manufacturer fault (now reportedly fixed) – the picture can turn completely pink.

By ushering in digital and ushering out people, it's not the medium that's under threat, it's the wealth of knowledge the industry is set to lose, as the art of projecting gives way to pixels and software packages.

"I think that some of the cinema chains are in an obscene hurry to dismantle the projectionist's role and are losing a dedicated skill base that will never return," comments BECTU national officer Mick Corfield. "They all know the cost of a digital projector but not the value of a dedicated projectionist."

It's a sad price to pay for a CGI Chipmunk, something shown by the documentary The Last Projectionist, which played at Cannes this year. And yet it found those facing unemployment quite pragmatic.

"The projectionists know they work with technology, and although it's a 100-year-old trade, if you go back further, that trade didn't exist," explains director Tom Lawes. "It's a

transient thing, and they understand that."

The Last Projectionist captures the history of cinema – particularly independent cinema – while the projectionist trade is still around. The documentary visits the IMAX at Birmingham's Thinktank to film the setup of its 70mm projector. Since then, the IMAX has announced it can no longer afford to maintain the print format and has become a 4K digital screen instead.

While the Thinktank projectionist still has a job, the future isn't bright for the man in the box. Eventually, someone will decide to streamline the system, and the role will be axed. But with the arrival of digital comes a new set of skills. In addition to the varying types of video files, there are events and satellite linkups that fill up cinema calendars. Digital theatre screenings, such as National Theatre's NT Live, regularly sell out around the world, as people are given a new way to access culture that simply wasn't possible with analogue.

The opportunities extend to regular programming too. While the New Beverly in LA continues its heartfelt campaign, the Electric cinema in Birmingham (owned by Last Projectionist director Lawes) has just upgraded its two screens to digital and enjoys the newfound flexibility.

"We can easily move films around from one screen to another," Lawes explains, highlighting the changing relationship between studios and smaller venues. "We showed X-Men: First Class this year one week off release date – that never would have happened before."

It's good for independent productions too: "We don't have to send a film off to another cinema. We can keep it here on the server and, for a small film such as Weekend, we've got the flexibility to show it again in a few months."

Producing a digital print is also far cheaper for film-makers, giving them a better shot at distribution. "Ironically, The Last Projectionist couldn't have been made without digital," Lawes admits. "If we had to create 10 35mm prints, you'd be looking at £20,000. Where's that going to come from? The Film Council? They've shut that down."

As The Last Projectionist gets a UK theatrical run next year with City Screen (who operate the Picturehouse cinemas chain), it's a fitting tribute to a dying age, as digital changes cinema for small companies as well as global corporations.

The year 2011 is the most important one for cinema since 1927. It's sad to see 35mm become a specialist format projected by a few, but 120 years is a pretty good run for any form of technology – DVD has only been around for 14. Even once 3D's appeal has worn off, digital will remain an exciting new medium for film-makers and audiences. And while the New Beverly and others continue to show prints the way they were originally intended, the machine keeps rolling forward. Film is dead. Long live film.

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# Entertainment Solutions

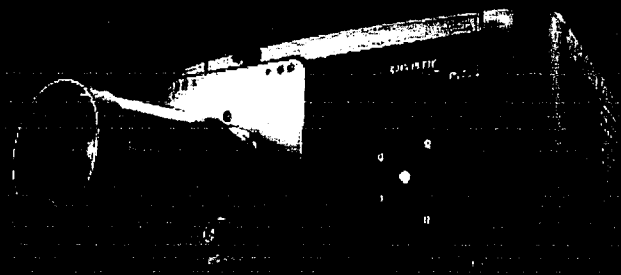
Digital cinema projection

Automation solutions

Auditorium accessories

Projector accessories

Alternative content presentations



**CHRISTIE**

## The clear choice

With no margin for error, the show must always go on. Christie brings over 80 years of experience, knowledge and value to your cinema business. We consistently offer you the best. All our cinema solutions feature Academy Award winning DLP Cinema technology. We pride ourselves on being the first with a 2K solution, the first to offer a 4K ready solution, and the first to introduce TI's new advanced Series 2 DLP Cinema technology. And we were the first to market a networked on-screen advertising solution to help support and grow your business.

Christie solutions are designed and engineered to provide the lowest cost of ownership in the industry. Our superior projector optics allow us to specify a smaller lamp than any of our competitors and still provide the highest brightness in each class. Within our exceptional line up of products, we're confident you'll find a projector that meets your needs.



### DLP Cinema Technology

2009 Academy Scientific  
and Engineering Award for  
Color Accuracy

AMPAS



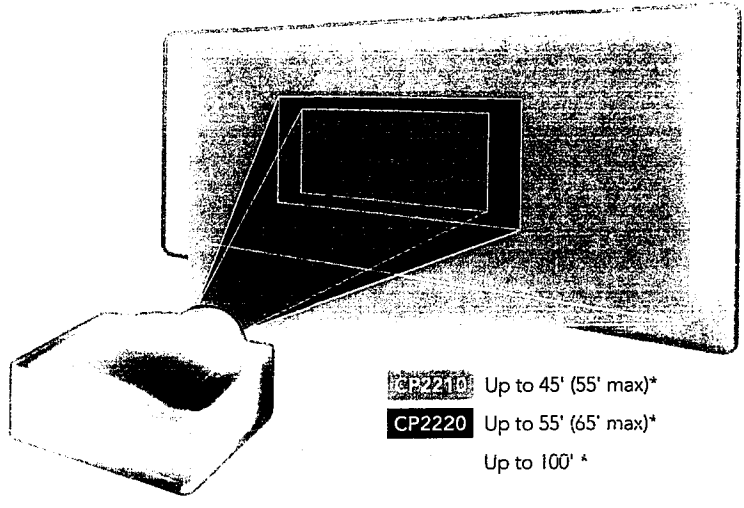
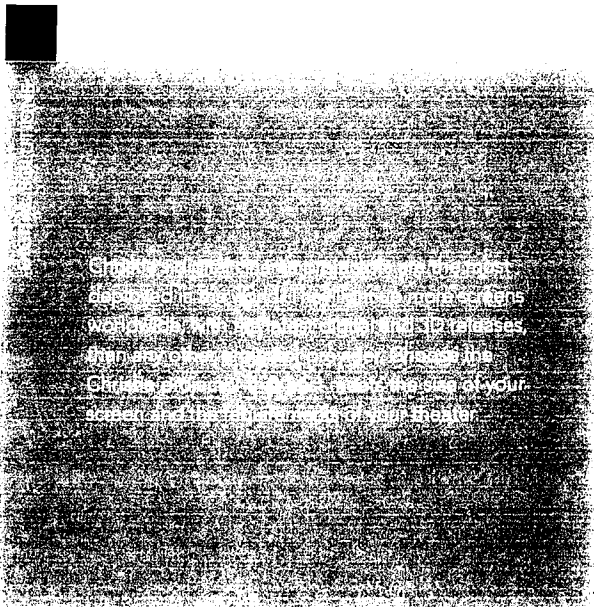
## A new world of 2K. The future of 4K.

It's only fitting that as the pioneer of digital projection technology for cinemas, we're the first to offer digital cinema solutions based on Series 2 DLP™ technology from Texas Instruments. This technology is designed to be compliant with the Digital Cinema Initiative (DCI) specification. It offers content owners the highest level of security and exhibitors the easiest solutions to operate and maintain.

We're proud to bring you the new Solaria Series. The Christie Solaria Series integrates the best of our proven CP2000 platform, with further performance enhancements that include standard support for an integrated media block and bandwidth for an ever-increasing variety of content, including 4K. The new Christie Solaria Series is the clear choice for any cinema exhibition environment.

CHRISTIE  
CP2230

DLP



**CP2210** Up to 45' (55' max)\*  
**CP2220** Up to 55' (65' max)\*  
 Up to 100' \*

\* Measured at screen center. Depending on auditorium variables such as screen gain, lamp age, geometry, etc

A modular design making it easier for you to swap and access any component you need quickly – we've incorporated quick disconnects and captive screws, included specialized tools, and provided easy access areas to allow swift diagnostic and repair of any major component

Built-in diagnostics on the back of the projector, in the user interface and on the input panels, indicate projector status at-a-glance from anywhere in the projector booth or a remote user interface

The improved Touch Panel Controller is an intuitive and simple to use interface. With new remote diagnostic and operational capabilities, any PC on the network can be used to control any projector either locally or from afar

There are more options to upgrade to 4K DLP™ than any other manufacturer because of our knowledge and experience with the 1.2" 2K platform

New electronics and software improve the reliability and uptime of Solaria projectors and the increased processing capabilities allow for faster start-up times

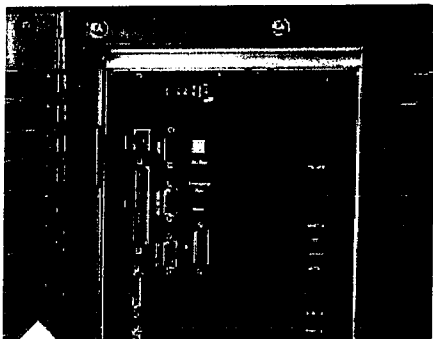
A new level of system integration with options for an integrated media block, streamlined installation support for 3D systems and the fastest, most accurate motorized lens mount in the industry

Additionally, due to the ability to deliver higher brightness with lower power lamps, all current and next generation Christie projectors offer up to 25% lower cost of operation than competing technologies.

The high reliability of our solutions means that in the most critical situations you can depend on Christie to outperform the competition. Our Christie CP2220 projector uses only a 3kW lamp to produce more lumens than our competitors do with a 4kW lamp. As such, it costs you less to power our products and you get better results – which keeps money in your pocket over the long run.

The brightest digital cinema projector in the industry  
 Litel OC™ feature for constant image brightness (depending on lamp type, age and screen size)  
 LamplOC™ feature for motorized three axis lamp alignment (automatic or manually adjusted)

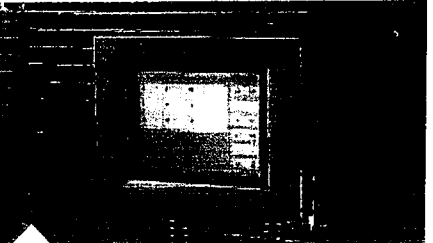
The products in the Solaria Series offer a wide range of resolution and brightness levels for exhibitors who require projection for the smallest to the largest screens. Included in the series are the Christie CP2210, Christie CP2220 and the Christie CP2230 giving you the ultimate projection solution in terms of reliability, operating costs and upgradability



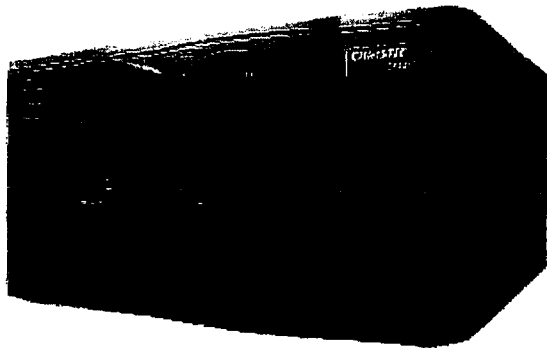
With a variety of interface capabilities, including support for HDCP and built-in de-interlacing capabilities, Solaria offers the widest support for a variety of signal formats and connections.



See projector status at-a-glance from anywhere



Our Touch Panel Controller offers operators an intuitive, simple to use interface



|                            |  |
|----------------------------|--|
| Brightness* lamp           | <ul style="list-style-type: none"> <li>• 1.4kW (CXL-14M)</li> <li>003-003066-01</li> <li>• 1.8kW (CDXL-18SD)</li> <li>003-002742-01</li> <li>• 2.0kW (CDXL-20SD)</li> <li>003-001976-01</li> </ul>   |
| screen size                | • <45' (55' max)*  |
| Contrast ratio             | • >2000:1 Full field-to-soft   |
| Digital micromirror device | <ul style="list-style-type: none"> <li>• 0.98" 2K 3-chip</li> <li>DMD DLP Cinema</li> <li>• 2048 x 1080 pixels</li> </ul>  |
| Input line voltage         | • Single phase 220V  |
| Number of colors           | • 35.2 trillion  |
| Lenses zoom                | • See accessory and lens listing page 7-8  |
| optional                   | <ul style="list-style-type: none"> <li>• 1.25x Anamorphic Lens 38-809054-XX</li> <li>• 1.26x Wide Converter Lens 108-281101-XX</li> <li>• Use of the Anamorphic or Wide Converter Lens requires the CP2210 MALM adapter 119-101101-01</li> </ul> |
| Power supply               | • 1kW 2.1kW low-ripple switch mode lamp power supply   |
| Dimensions size            | • Projection head & lamp power supply (LxWxH): 27 x 26 x 15" (687 x 665 x 395mm)   |
| weight                     | • As installed: 96lb max (43.5kg)  |

The Christie CP2210 is the most compact digital cinema projector in the world and the projector of choice for the world's leading post-production facilities and exhibitors where booth space is at a premium. Coming from a heritage in cinema, we know what it takes to keep production and installation schedules on track. The high reliability of our solutions mean that in the most critical situations, you can depend on Christie to outperform the competition.

Purpose-built for long-term reliability, the Christie CP2210 is the industry's most compact DCI compliant projector available today. At less than 100 pounds, the projector can be transported and installed by only two people.

Based on .98" DLP Cinema™ technology, the Christie CP2210 uses high efficiency, long-lasting CDXL-SD series Xenon lamps as well as the CXL-14M, a new lamp designed for long life and low power consumption. The competition requires higher wattage lamps for the same light output, giving Christie clear advantage on cost of ownership and lumens per watt.

A robust and reliable addition, the Christie CP2210 features a motorized lensing solution and a selection of eight new zoom lenses to guarantee the right lens solution for virtually any auditorium with absolutely no need for resizing or scaling. It is the projector of choice for small screens and post production applications that demand performance and reliability in a small, affordable package.

HDCP and SNMP support as standard features

One piece compact design for flexible mounting and installation

Switching 2.1kW lamp power supply for lowest ripple, maximum performance and reliability

Split power operation for use with UPS

Local control via flexible Touch Panel Controller (TPC) and full access from anywhere via web service based GUI

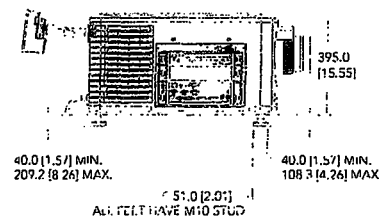
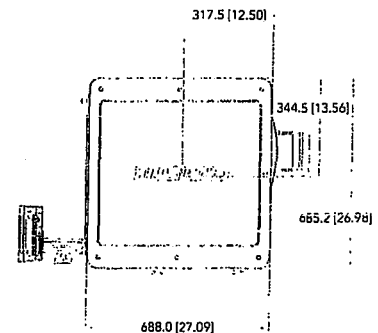
Rear access for quick and easy lamp changes

Brilliant 3D technology for high performance 3D with no need for re-sizing or scaling of feature or alternative 3D content

Optional Christie CP2210 Motorized Auxiliary Lens Mount (MALM) for use with an optional Anamorphic or Wide Converter Lens

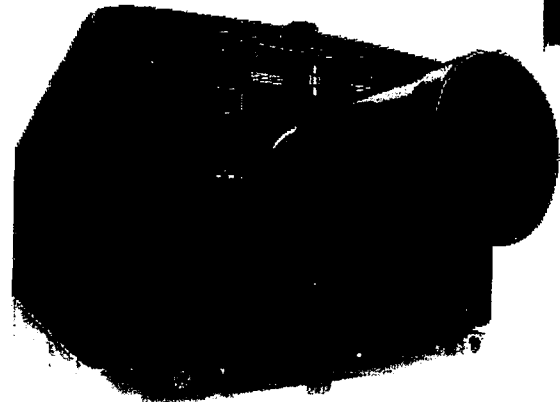
New Intelligent Lens System (ILS)™, custom designed for cinema, for reliable motorized lens operation

In its standard configuration, the Christie CP2210 requires no heat extraction, an optional duct is available if desired



\* Measured at screen center. Depending on auditorium variables such as screen gain, lamp age, geometry, etc.





|                            |   |
|----------------------------|---|
| Brightness* lamp           | <ul style="list-style-type: none"> <li>• CDXL-20 003-000598-XX</li> <li>• CDXL-30 003-000599-XX</li> <li>• CDXL-30SD 003-001165-XX</li> </ul>   |
| nominal                    | • ~22,000 lumens  |
| screen size                | • <55" (65" max)*   |
| Contrast ratio             | • 2100:1 full field on/off  |
| Digital micromirror device | <ul style="list-style-type: none"> <li>• 1.2" 2K 3-chip DMD DLP Cinema™</li> <li>• 2048x1080 pixels</li> <li>• Upgradable to 1.38" 4K (4096 x 2160 pixels)</li> </ul>   |
| Input line voltage         | • Single phase 220V   |
| Number of colors           | • 35.2 trillion   |
| Lenses zoom                | <ul style="list-style-type: none"> <li>• See accessory and lens listing page 7-8</li> </ul>   |
| optional                   | <ul style="list-style-type: none"> <li>• 1.26x Anamorphic Lens 38 809054-XX</li> <li>• Wide Converter Lens 108 281101-XX</li> <li>• Use of the Anamorphic or Wide Converter Lens requires the MALM 108-111102-XX</li> </ul> |
| Power supply               | • 3.3kW low-ripple switch mode lamp power supply  |
| Dimensions size            | <ul style="list-style-type: none"> <li>• Projection head &amp; lamp power supply (approx., LxWxH) 46 x 25 x 19" (1168 x 635 x 483mm)</li> </ul>   |
| weight                     | • As installed, 256lb max (116kg)   |

Designed for ease of use and maximum reliability with the majority of screens in commercial exhibition, the Christie CP2220 is an all-in-one digital cinema projection solution that is the brightest, highest performance projector with the lowest operating costs in its class. The new user interface and electronics showcase improvements in speed and performance that help make the Christie CP2220 the workhorse of the industry.

Purpose-built for exhibitors, the Christie CP2220 delivers 22,000 lumens with a 3kW lamp in a cost-effective, compact solution for flexible mounting, servicing and installation. The Christie CP2220 is built on proven and reliable 1.2" 2K DMD DLP Cinema™ technology, featuring a contrast ratio greater than 2100:1 and reproduces 35.2 trillion colors.

Featuring an internal universal switching lamp power supply, the Christie CP2220 provides maximum performance and reliability. Additionally, the Christie CP2220 is up to 50% smaller by volume than other projectors on the market and can be placed on a variety of rack stands and pedestals. Available as an optional accessory, the motorized lens mount is the fastest and most accurate available on the market. It is compatible with Christie's complete line of zoom lenses.

Based on the popular CP2000-ZX platform, the Christie CP2220 offers full 2K resolution triple flash for 3D projection and built-in support for HDCP and de-interlacing of alternative content. Using the Texas Instruments 1.2" DMD allows for bright and brilliant 3D images and more efficient cooling which extends the life of the projector.

The ergonomic design offers simplicity of use in a robust and reliable package.

The optional motorized lens mount, designed specifically for use in the varied exhibition, is stable and solid. With improved airflow and better cooling, the Christie CP2220 promotes longer lamp life, lower cost of ownership and greater reliability than the competition.

Compact design for flexible mounting and installation

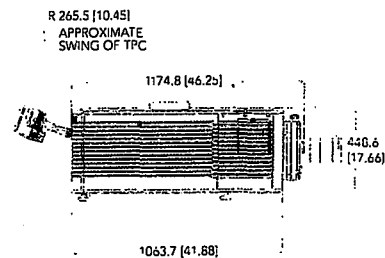
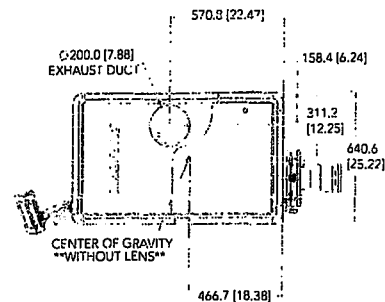
Switching lamp power supply for lowest ripple, maximum performance and reliability

HDCP, VNC and SNMP support standard

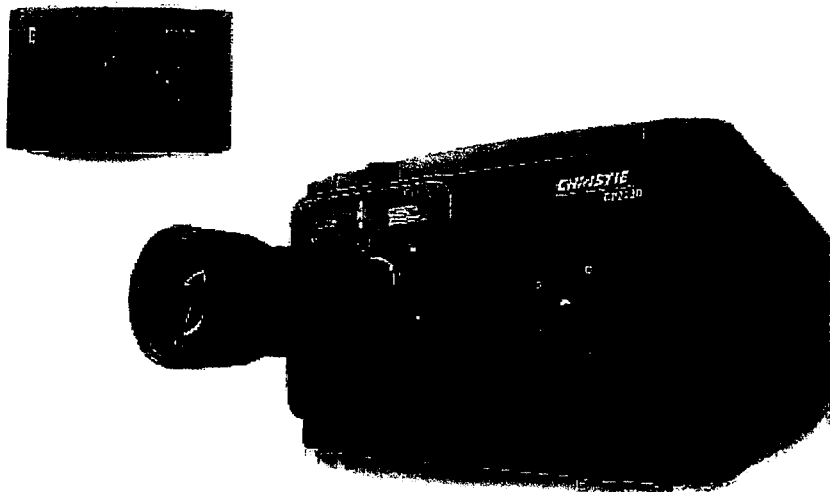
Touch Panel Controller platform offers operators an intuitive, simple to use interface. With new remote diagnostic and operational capabilities, any PC on the network can be used to control any projector either locally or from afar.

Operates with standard 2kW, 3kW and high performance 3kW cinema lamps

UPS split power operation for optimum electrical efficiency



\* Measured at screen center. Depending on auditorium variables such as screen gain, lamp age, geometry, etc.



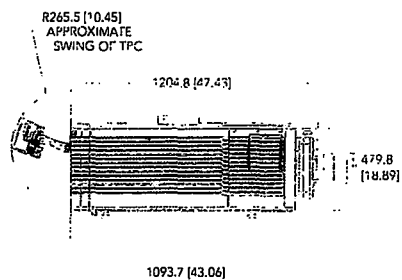
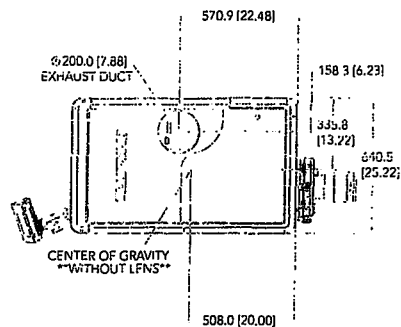
|                            |   |
|----------------------------|---|
| Brightness* lamp           | <ul style="list-style-type: none"> <li>• CDXL 70 003-000598</li> <li>• CDXL-30 003-000599</li> <li>• CDXL-45 003-000600</li> <li>• CDXL-60 003-000601</li> </ul>  |
| nominal                    | • -32,000 lumens  |
| screen size                | • >53'  |
| Contrast ratio             | • >2100:1 full field on 7.5'  |
| Digital micromirror device | <ul style="list-style-type: none"> <li>• 1.2" 2K 3-chip DMD DLP Cinema*</li> <li>• 2048x1080 pixels</li> <li>• Upgradable to 1.38" 4K (4096 x 2160 pixels)</li> </ul>   |
| Input line voltage         | • 3 Phase 208/400V  |
| Number of colors           | • 35.2 trillion   |
| Lenses zoom                | <ul style="list-style-type: none"> <li>• See accessory and lens listing page 7-8</li> <li>optional: <ul style="list-style-type: none"> <li>• 1.26x Anamorphic Lens 38-809054-XX</li> <li>• Wide Converter Lens 108-281101-XX</li> <li>• Use of the Anamorphic or Wide Converter Lens requires the MALM 108-111102-XX</li> </ul> </li> </ul> |
| Power supply               | • 7kW low-ripple switch mode lamp power supply  |
| Dimensions size            | <ul style="list-style-type: none"> <li>• Projection head (approx. LxWxH): 47 x 25 x 19" (1194 x 635 x 483mm)</li> <li>• Lamp power supply (approx., LxWxH): 22 x 16 x 16" (547 x 414 x 407mm)</li> </ul>  |
| weight                     | <ul style="list-style-type: none"> <li>• As installed: 245lb max (111kg)</li> <li>• Lamp power supply: 70lbs max (32kg)</li> </ul>  |

The Christie CP2230 offers you the brightest digital cinema projector on the market with its unique optical design. According to Jack Kline, President and COO, the dramatic acceleration in the pace of global installations is a testament to Christie's proven technology, software, and services integrated in each system. "Our unparalleled success is based on more than 80 years of experience. Quality and world-class support services remain our number one priorities as we work with exhibitors to help them make the digital transition seamlessly and revolutionize the movie-going experience."

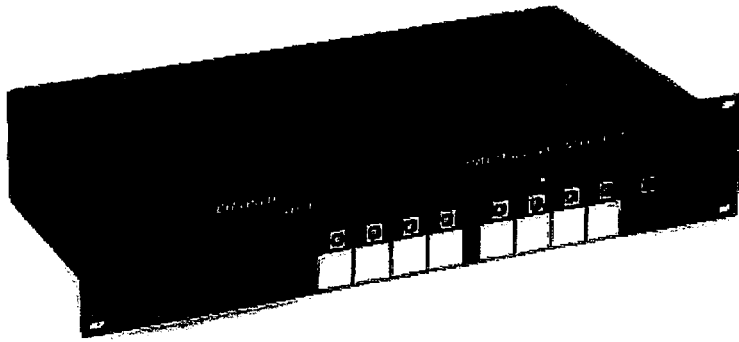
Setting new standards with Brilliant3D™ 2K technology, the Christie CP2230 features unique optics and superior image processing for crisp, clean images with perfect color saturation and spectacular video. With over 32,000 lumens, the Christie CP2230 is our brightest digital cinema projector for screens nearly 100 feet wide. It is ideally suited for large screen theaters, post-production houses, multi-media theatrical productions and the most demanding 3D installations!

The unique split-body design with separate projection head and lamp power supply lets you put very high power in almost any space. The universal lamp power supply gives you maximum flexibility. Freed from the requirement of a dedicated pedestal, the Christie CP2230 can be installed almost anywhere.

- Separate projection head and lamp power supply
- Adjustable lamp power – 1000-7000W
- >2100:1 sequential contrast – 30,000 lumens
- 7.5, 15 and 30 meter umbilical lengths for the lamp power supply
- Most flexible high power solution in the industry
- Highest contrast ratio in 3-chip DLP Cinema\*
- Lowest cost of operation
- Standard support for HDCP, SNMP and VNC
- Local control through Christie's industry standard setting Touch Panel Controller
- UPS split power operation
- Optional motorized lens mount
- 1-7kW switching power supply



\* Measured at screen center. Depending on auditorium variables such as screen gain, lamp age, geometry, etc.



Now the most popular dedicated digital cinema automation device in the world, the Christie ACT puts control of your single screen, multiplex or entire theater chain in your hands. Our flexible theater automation solution and powerful open architecture can integrate fully with any end user application. With its flexibility, programmability and user-friendly Graphic User Interface (GUI) – the average user can easily customize tasks and scripts to specifically suit the needs of their own theater operation/complex.

The Christie ACT is a 2RU steel box with general purpose I/O, 2 high current (10A) relays, 10 1A relays, RS-232, RS-422, accessory power, and Ethernet.

The main user interface used for set-up and operation can be accessed from any external computer's web browser.

Completely programmable via easy-to-use web interface

Includes device support for all Solaria Series projectors and various audio processors

Users can define nearly an unlimited number of "virtual actuators"

Automation via simple GUI or advanced scripting

Sharing scripts between multiple Christie ACTs

Pre-defined scripts for supporting external devices

Customized support for any product with published manufacturer specifications

The Christie Cine-IPM 2K is a professional grade scaler for post-production and cinemas the world over, bringing the latest alternative content to the big screen. Using a comprehensive 10-bit image processing package, the Cine-IPM 2K takes control of the incoming signal and will display any standard output format regardless of the source. The Cine-IPM 2K accurately displays non-cinema or alternative content such as broadcast television, satellite, business presentations and HDTV sources. The Christie Cine-IPM 2K offers image scaling, image processing and reformatting. It handles both standard and HD sources and integrates easily for use with any Solaria Series projector. Additional input modules are available to accommodate virtually any digital or analog source.

The Christie Multimedia Adapter is a video and audio device that can accomplish a unique variety of video scaling and audio conversion tasks. Any item can be scaled and displayed with total end-user control. An on-screen display (OSD) and a front panel LCD with full-featured settings allow you to fine-tune your viewing experience and get the most out of your current AV set-up. The Multimedia Adapter will scale your image to your digital cinema projector or DVI/HDMI display and is HDCP compliant.

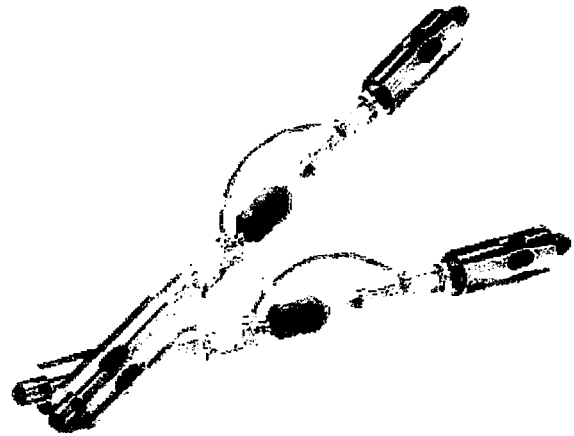
The WCL achieves an accurate unattended zoom from a "flat" image format of 1.85:1 to a "scope" image format of 2.39:1. At the same time, it maintains the full resolution of the source data. Other possible solutions are either impractical, cost-prohibitive or simply do not exist. The WCL simply mounts in front of a standard prime lens and expands the image just like a zoom of 1.26x, expanding the image to effectively decrease the throw ratio. For example, it converts the zoom range of our 2.2-3.0 lens to 1.75-2.38. In essence, the WCL is a focal length adapter.

The MALM moves the WCL out of the light path to do this and does not affect the "flat" image, focus, location or performance in any way. Only lenses with throw ratios above 1.45:1 are certified to work with the WCL.

The Christie Rack Stand supports the Christie CP2210, CP2220 and CP2230 projectors. The rack stand is 39.5" high to work with typical port and lens configurations and can support 750W of equipment, or 9RU when the Christie CP2230 lamp power supply is mounted inside.

108-282101-02 Rack Stand (fully assembled)  
 116-100101-01 CP2220 / 2230 rear feet lock downs  
 119-100101-01 CP2210 rear feet lock downs

38-813028-51 Variable Aperture Kits for 2220 and 2230  
 700120-074 In-line 120V Duct Fan, 600 CFM  
 111-277001-01 Three phase to single phase power distribution unit w/accessory power



Lens Mount Motor

|               |                   |
|---------------|-------------------|
| 127-102104-01 | Kit Motor upgrade |
| 108-274101-01 | 1.25-1.45.1       |
| 108-342100-01 | 1.75-1.83.1       |
| 108-275101-01 | 1.45-1.8.1        |
| 108-335102-01 | 1.45-2.05.1       |
| 108-336103-01 | 1.6-2.4.1         |
| 108-276101-01 | 1.8-2.4.1         |
| 108-337104-01 | 1.8-3.0.1         |
| 108-338105-01 | 2.15-3.6.1        |
| 108-277101-01 | 2.2-3.0.1         |
| 108-278101-01 | 3.0-4.3.1         |
| 108-279101-01 | 4.3-6.0.1         |
| 108-280101-01 | 5.5-8.5.1         |
| 38-809079-51  | 1.25-1.45.1       |
| 38-809061-51  | 1.45-1.8.1        |
| 38-809052-51  | 1.8-2.4.1         |
| 38-809053-51  | 2.2-3.0.1         |
| 38-809069-51  | 3.0-4.3.1         |
| 38-809081-51  | 4.3-6.0.1         |
| 38-809080-51  | 5.5-8.5.1         |
| 108-319104-01 | 1.05.1            |
| 108-320106-01 | 1.30-1.75.1       |
| 108-327103-XX | 1.39-1.9.1        |
| 108-329105-XX | 1.5-2.2.1         |
| 108-321107-01 | 1.75-2.40.1       |
| 108-328104-XX | 1.9-3.0.1         |
| 108-322108-01 | 2.40-3.90.1       |
| 108-323109-01 | 3.90-6.52.1       |

Christie digital cinema dimmers are available in 1, 2, and 4-channel versions for both 110/115 VAC and 220 VAC, 50/60Hz operation. Programming for each of the four presets for intensity levels and fade times are digitally controlled by the input keypad at the dimmer. The front panel has LED indicators (for both power and channel output level) and a manual panic activation/reset button (instant lights/up/full). Optional dimmer mounted circuit breakers are also available. UL and CSA listed.

Extra large heat sink for trouble-free "cool" operation

Easy-to-read display shows light level and up/down fade times

Simple 3 button programming: up/down/set

Channel light level and status indicators

Simple connections and wiring layout

Solid state digital control system, effortless automation interfacing

|                    |                                |
|--------------------|--------------------------------|
| 700107-019 or 020* | 2 x 2400W dimmer               |
| 700107-021 or 022* | 2 x 2400W dimmer with breakers |
| 700107-023 or 024* | 4 x 2400W dimmer               |
| 700107-026 or 027* | 4 x 2400W dimmer with breakers |

\*Note: specify 110 VAC or 220 VAC

Christie's Xenolite® lamps light up screens around the world and help you provide the best cinema experience to your patrons. To get a true representation of color in any environment requires a truly remarkable light source and the Christie Xenolite® lamp delivers. The lamps offer stable color temperature, a wide range of power levels and excellent color rendition.

At the heart of Christie's digital cinema projector line are Christie's CDXL high performance Xenolite® lamps. These lamps have been optimized for use with Christie digital cinema projectors. With increased brightness in the same form factor as standard cinema grade lamps, CDXL lamps provide higher output and brightness in a more compact, low profile package.

Christie lamps lower operating costs, increase light output and efficiency, and save maintenance costs. With a proven uptime of 99.999% you know your show will always be on screen.





Being successful means focusing on your core competencies. With a broad scale system deployment that is technically complex, the implementation and support may not be your expertise. A partnership with Christie puts the right tools in your hands.

Drawing on over 80 years of experience working with Fortune 1000 companies, Christie Managed Services delivers a portfolio of proven, reliable, services to support our customers' hardware and software assets. As the industry leader in all types of technical service installations, monitoring and maintenance, Christie has the capability to do technology-focused, large scale, national systems.

We've developed a broad range of services that go from inception to sustainment. Christie Managed Services manages programs and provides our customers with a single source contact. We work with our customers on the planning, procurement, logistics, pre-staging and integration and implementation of a rollout. Once your program is up and running, we can monitor and maintain the system – that means reduced downtime and reliable support for our customers. Christie Managed Services delivers reliable technical support to meet the unique technology needs of your organization from round-the-clock, 24/7 programs to Pay-Per-Incident and everything in between.

With a technology-agnostic approach, Christie Managed Services supports a wide array of manufacturers: projectors, technology platforms, visual displays, servers, switches and networking products.



**Corporate offices**

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10000 North Central  
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USA

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consultant offices**

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Christie Digital

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**Worldwide offices**

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For the most current specification information, please visit [www.christiedigital.com](http://www.christiedigital.com)

**CHRISTIE**



S O L A R I A

**CHRISTIE**



# A new world of 2K. The future of 4K.

It's only fitting that as the pioneer of digital projection technology for cinemas, Christie is the first to offer digital cinema solutions based on Series 2 DLP™ technology from Texas Instruments. The technology is designed to be compliant with the Digital Cinema Initiatives (DCI) digital cinema specification, offering you the highest content security with the easiest to use solution on the market.

As the leading supplier of projection solutions to cinemas and post-production facilities around the world, Christie is proud to bring you the new Solaria Series. Utilizing Texas Instruments' highly anticipated next-generation DLP Cinema™ technology, Solaria integrates the best of our proven CP2000 platform, with further performance enhancements that include standard support for integrated media block. The new Christie Solaria Series is the clear choice for any cinema exhibition environment.



CHRISTIE

CP2220



- Brightest solutions, ideal for 3D applications
- Texas Instruments Series 2 technology
- Lowest cost of operation
- 4K ready

#### What sets Christie's Solaria Series apart?

The Solaria Series offers system specifications that accommodate both 2K and 4K resolution versions of the projectors helping create cost effective and widely compatible digital cinema solutions. All Solaria projectors have precise brilliant color that you expect from Christie with superior contrast ratios and the light output necessary to light up even the largest auditoriums. Furthermore, the next generation DLP Cinema electronics platform features increased bandwidth capabilities that expand the menu of options for alternative content and alternative revenue streams for your cinema.

3D is already taking movies and the theater experience to new and exciting levels, both with the incredible images the projectors can deliver and the creativity that the new tools allow. The Solaria Series incorporates Christie's Brilliant3D™ (full 2K resolution triple flash) technology for the most realistic and brightest 3D presentations. And as the leader in the market, we know what it takes to manufacture and integrate a solution that is right for you.

#### The future of 4K

When you're ready, your Solaria Series digital cinema projector is ready for 4K. The CP2220 and 2230, our mid and high projectors respectively, were designed from the start to be fully upgradable to 4K technology. As a result Christie's 4K upgrade path is the fastest and most cost effective in the industry.

We have taken this opportunity to improve not only performance, but also the design and interaction of the world's most-installed cinema projection line-up.

The high reliability of our solutions means that even in the most critical situation you can depend on Christie.



A modular design making it easier for you to swap and access any component you need quickly – we've incorporated quick disconnects and easy access areas to allow swift diagnostic and repair of any major component.

Built-in diagnostics on the back of the projector, in the user interface and on the input panels that indicate projector status at-a-glance from anywhere in the projector booth or a remote user interface. By improving our popular Touch Panel Controller platform and incorporating it on all of our new cinema projectors, the Christie Solaria Series offers operators an intuitive, simple to use interface. With new remote diagnostic and operational capabilities, any PC on the network can be used to control any projector either locally or from afar.

The split-body design of Christie's Solaria CP2230 revolutionizes the world of digital cinema projection. The separate projection head and ballast lets you put very high power in almost any space. The improved universal ballast gives you maximum flexibility. New electronics and software improve the reliability and uptime of Solaria projectors and the increased bandwidth allows for faster start up times.

A new level of system integration with options for an integrated media block, streamlined installation support for 3D systems and the fastest, most accurate motorized lens mount in the industry.

Additionally, due to the ability to deliver higher brightness with lower power lamps, all current and next generation Christie projectors offer up to 25% lower cost of operation than competing technologies.

The high reliability of our solutions means that in the most critical situations you can depend on Christie to outperform the competition. Our Christie CP2220 projector uses only a 3K lamp to produce more lumens than our competitors do with a 4K lamp. As such, it costs you less to power our products and you get better results – which keeps money in your pocket over the long run.

Platform independent Touch Panel Controller

Fastest and most cost effective upgrade path to 4K

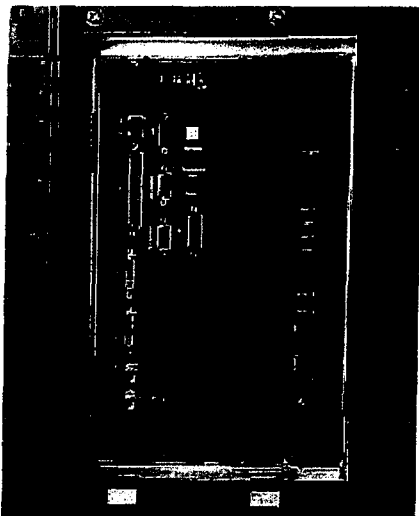
Lowest cost of operation of any digital cinema projector on the market

The brightest digital cinema projector in the industry

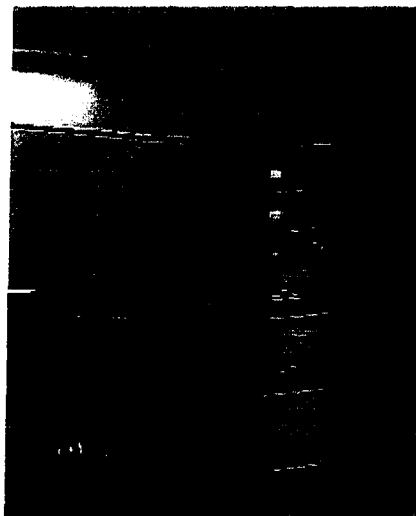
LiteLOC™ feature for constant image brightness (depending on lamp type, age and screen size)

LampLOC™ feature for motorized three-axis lamp alignment (automatic or manually adjusted)

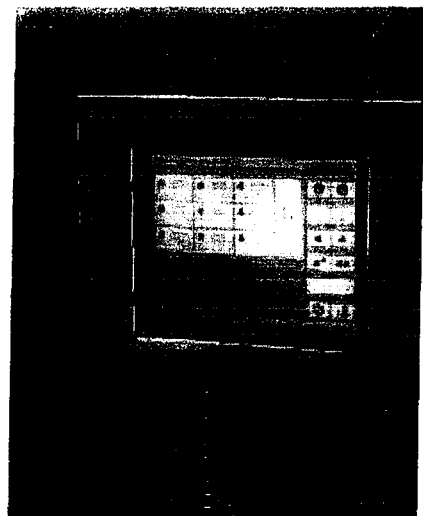
The products in the Solaria Series offer a wide range of resolution and brightness levels for exhibitors who require projection for the smallest to the largest screens. Included in the series are the Christie CP2210, Christie CP2220 and the Christie CP2230 giving you the ultimate projection solution in terms of reliability, operating costs and upgradability both now and in the future



▲ With a variety of interface capabilities, Solaria offers the widest support for a variety of signal formats and connections

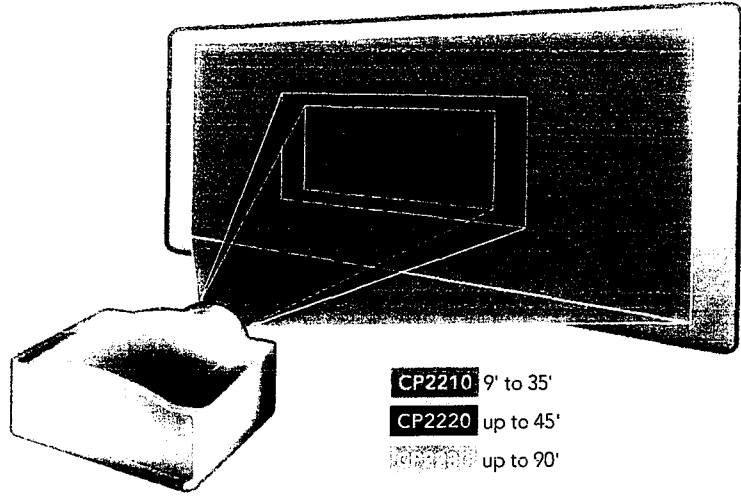


▲ See projector status at-a-glance from anywhere.



▲ Our Touch Panel Controller offers operators an intuitive, simple to use interface

Christie's CP2000 Series projectors are the most deployed digital cinema projection solution in the world. Our digital cinema projectors light up screens around the world with the latest digital releases from major studios. Choose the projector that best meets the size of your screen and the requirements of your theater.



CP2210 9' to 35'

CP2220 up to 45'

CP2230 up to 90'

Weighing in at only 98lbs and packing nearly 15,000 lumens of output, the CP2210 is the industry's most compact DCI compliant projector available today. With a new lamp warranty and pricing structure, the CP2210 is the projector of choice for small screens and post production applications that demand performance and reliability in a small, affordable package. Based on .98" DLP Cinema chip technology, the CP2210 uses high efficiency CPXL 5000 series Xenon lamps, while the competition requires larger, 3000 watt lamps for the same light output – a clear Christie advantage on cost of ownership and lumens per watt.

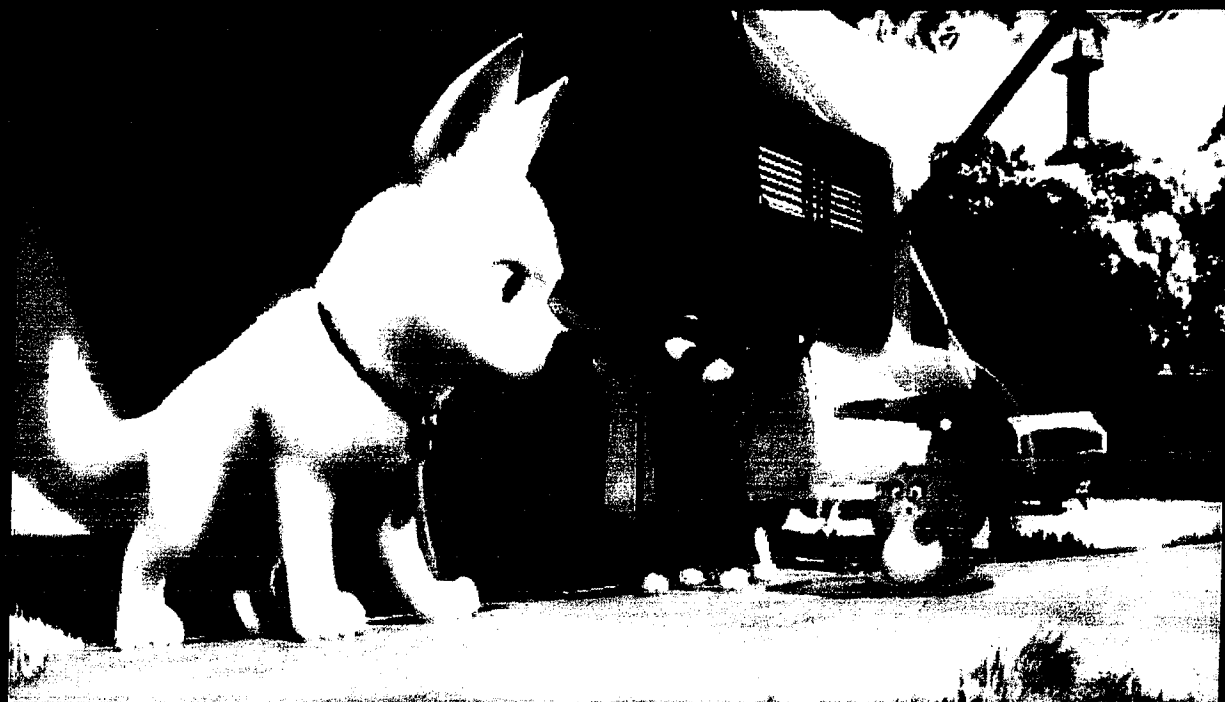
Achieving over 18,500 lumens with just a 3kW lamp, the CP2220 is the workhorse of the industry providing you with a solution that accommodates the majority of auditoriums in the market with a compact easy-to-install projector that can be set up in a matter of minutes. Purpose-built for exhibitors, the CP2220 delivers a cost-effective, compact solution for flexible mounting, servicing and installation. The CP2220 is built on proven and reliable 1.2" 2K DLP Cinema chip technology, featuring a contrast ratio greater than 2000:1 and reproducing 35.2 trillion colors.

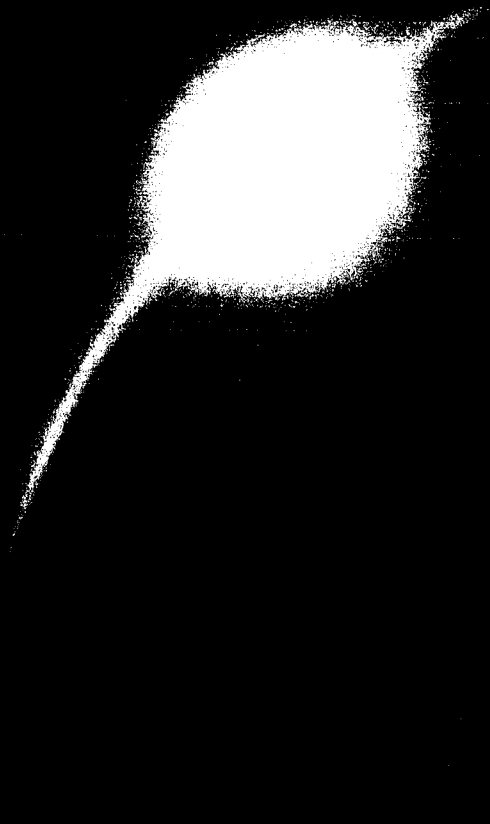
With over 30,000 lumens, the CP2230 is our brightest digital cinema projector for screens nearly 100 feet wide. Freed from the requirement of a dedicated pedestal, the CP2230 can be installed nearly anywhere. In the most demanding spaces where price is at a premium, you can still put on the best show possible with the highest output of any projection system available on the market.

|                            | CP2210  | CP2220  | CP2230  |
|----------------------------|---|---|---|
| Brightness* lamp           | 2.0kW (CDXL 20SD)   | 3.0kW (CDXL 30SD)   | 6.6kW (CDXL 60)   |
| nominal                    | ~15,000 lumens  | ~18,500 lumens  | >30,000 lumens  |
| screen size                | <45' (55' max)**  | 55' (65' max)**   | >55**   |
| Contrast ratio             | 2000:1  | 2000:1  | 2000:1  |
| Digital micromirror device | 0.98" 2K 3-chip DMD DLP Cinema chip<br>2048 x 1080 pixels               | 1.2" 2K 3-chip DMD DLP Cinema chip<br>2048 x 1080 pixels<br>Upgradable to 1.38" 4K (4096 x 2160 pixels) | 1.38" 4K 3-chip DMD DLP Cinema chip<br>4096 x 2160 pixels                         |
| Input line voltage         | Single phase 220V   | Single phase 220V   | 3 Phase 208/400V  |
| Number of colors           | 35.2 trillion   | 35.2 trillion   | 35.2 trillion   |
| Power supply               | 1kW-2.1kW low-ripple<br>switch mode lamp ballast                        | 3.3kW low-ripple<br>switch mode lamp ballast  | 7kW low-ripple<br>switch mode lamp ballast  |
| Dimensions                 | Projection head & ballast (LxWxH):<br>27 x 26 x 15" (687 x 665 x 395mm) | Projection head & ballast (approx., LxWxH):<br>42 x 25 x 16" (1066 x 635 x 406mm)                       | Projection head & ballast (approx., LxWxH):<br>43 x 25 x 16" (1066 x 635 x 436mm) |
| Weight                     | As installed: 96lb max (43.5kg)   | As installed: 256lb max (116kg)   | As installed: 245lb max (111kg)   |

\* Measured at screen center.

\*\* Depending on auditorium variables such as screen gain, lamp age, geometry, etc.





Corporate offices

Christie Digital Cinema  
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Dunlop  
1100 000

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For the most current specification information, please visit

**CHRISTIE**



**CHRISTIE®**

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**Solaria™ Series**

**CP2220**



**USER MANUAL**

020-100420-05

**CHRISTIE**

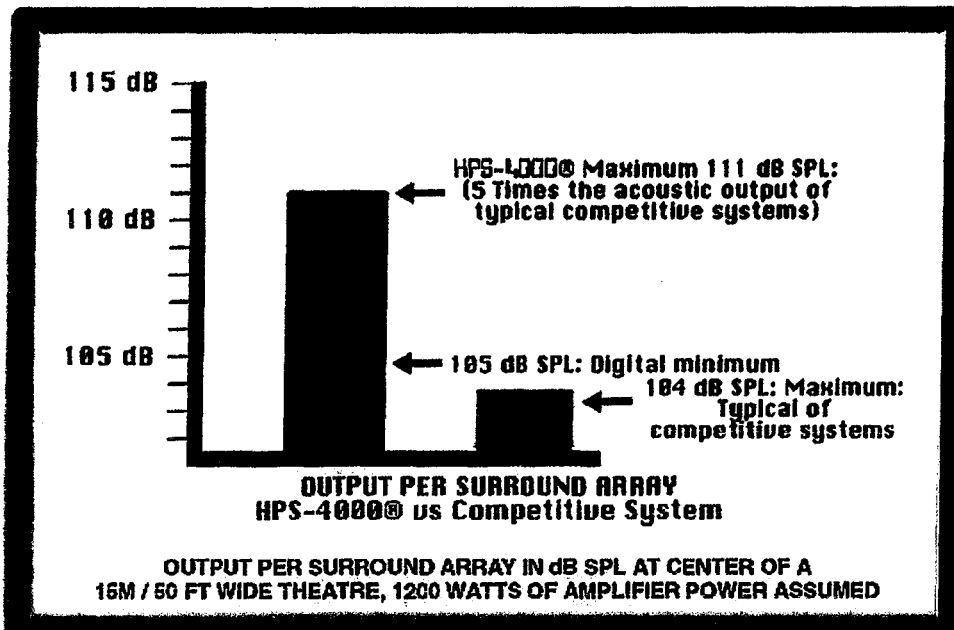
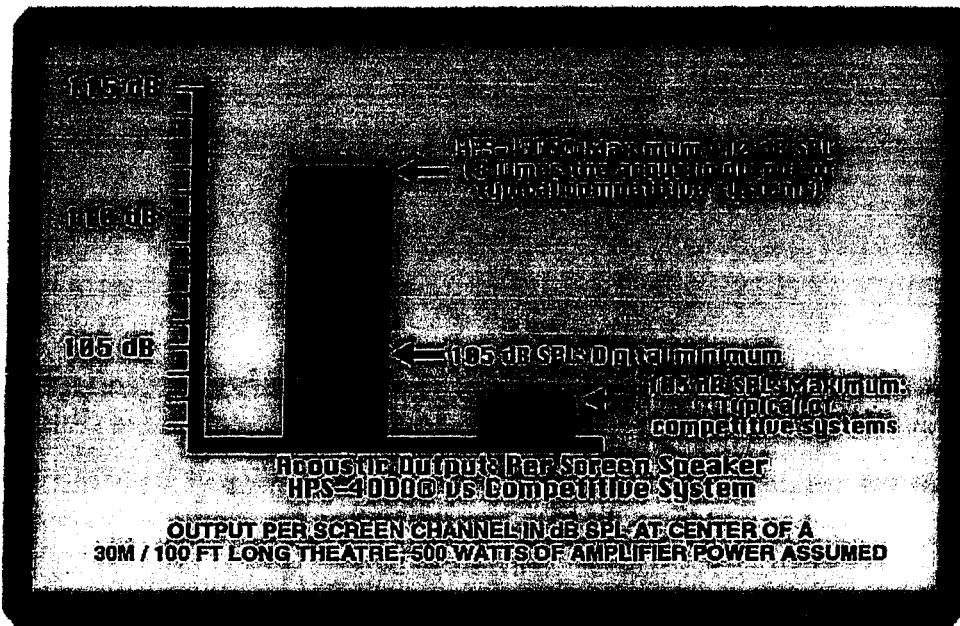


## HPS-4000® PERFORMANCE COMPARISONS

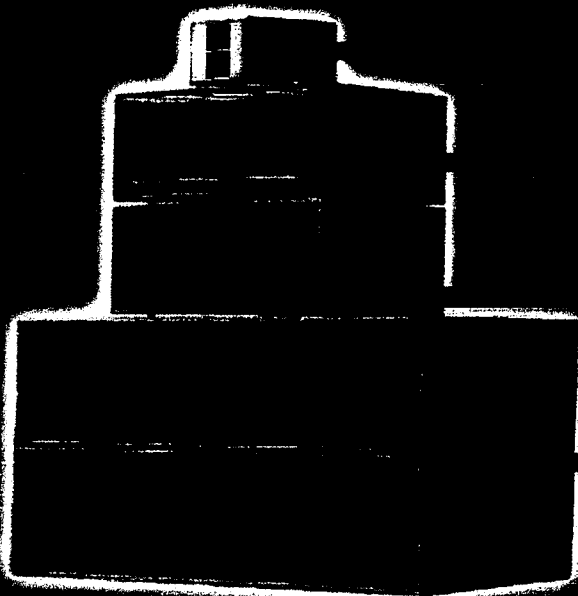
HIGHER EFFICIENCY = LOWER COSTS

Comparing HPS-4000® sound systems to others is like comparing an eight cylinder engine to a one or two cylinder engine.

HPS-4000® sound systems offer performance advantages not available from other sound systems. This is primarily due to the higher efficiency of the HPS® loudspeakers. These charts graphically show how the HPS-4000® sound systems achieve greater Sound Pressure Levels than the competitive systems with the same amount of amplifier power. These lower power needs are the reason HPS-4000® sound systems cost so much less than conventional systems when built to deliver the same power output.



## HIGH PERFORMANCE STEREO™ 545 Series Digital-Ready Motion Picture Loudspeakers



High performance super-tweeter maintains proper coverage  $\pm 5^\circ$  through a movie screen  
 • Delivers transparent clarity and uniform coverage, even in the largest theatres.

Self-equalized midrange horn • Behind-the-screen reflections eliminated  
 • Natural sounding, highly durable phenolic driver diaphragms provide smooth response and perfect dialogue intelligibility • Built-in crossover.

Optional sub-midrange section reduces overall distortion, providing even greater clarity • Less acoustic absorption required in the theatre, none required behind the screen.

World's most powerful motion picture woofer system • No baffle walls required  
 • Modular construction for easier handling • Two specially manufactured 15 inch drivers • Improved throat design  
 • Minimized cabinet resonances  
 • Output matched to the high frequency sections, eliminating the need for bi-amplification.

### SPECIFICATIONS:

|                           |                           |
|---------------------------|---------------------------|
| Sensitivity, 1W/1M        | 100 dB                    |
| Peak Power Capacity       | >1500 Watts               |
| Frequency Response        | 20-16000 Hz $\pm 2.5$ dB  |
| Minimum Impedance         | 4 Ohms                    |
| Nominal Beamwidth         | 60° H x 40° V*            |
| Movie Screen Compensation | Included                  |
| Input connection          | Heavy Duty Terminal Block |

### DIMENSIONS:

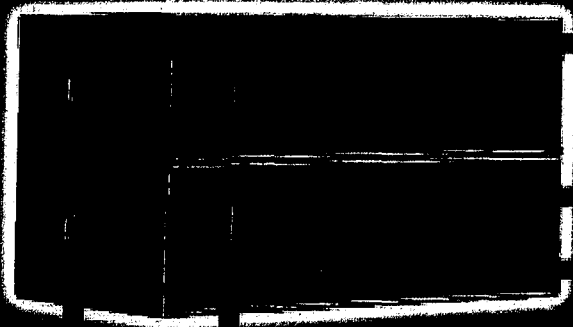
|                |                     |
|----------------|---------------------|
| Width at front | 68 1/4" (173.96cm)  |
| Width at rear  | 32" (81.28cm)       |
| Height (4-way) | 71 9/16" (181.76cm) |
| Height (3-way) | 57 1/16" (144.93cm) |
| Depth          | 44" (111.76cm)      |
| Weight (4-way) | 446 LBS. (202.31kg) |
| Weight (3-way) | 371 LBS. (168.29kg) |

HIGH PERFORMANCE STEREO™

NEWTON, MA 02459 USA • TEL: 1-617-244-1737

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**HIGH PERFORMANCE STEREO™ 545-W Series  
Digital-Ready Motion Picture Subwoofers**



World's most powerful motion picture woofer system • No baffle walls required • Constructed in modules for easier handling • Improved throat design • Less than 1/20 th of the power required when compared with typical subwoofers.

Specially designed HPS® 15 inch low frequency drivers in sealed back air chambers • They cannot "bottom."

Folded exponential bass horn • 10 1/4 square foot radiating area • Cinema's most natural sounding bass.

Extensive bracing, inside and out, minimizes annoying resonances.

Heavy duty No. 6 gauge input connection terminal • Handles for easy lifting.

**SPECIFICATIONS, ONE MODULE /  
TWO MODULES:**

|                                 |                           |
|---------------------------------|---------------------------|
| Sensitivity, 1W/1m              | 106 / 109 dB              |
| Peak Power Capacity             | >750 / >1500 Watts        |
| Frequency Response, 40 - 400 Hz | ±2.5 dB                   |
| Minimum Impedance               | 8 / 4 Ohms                |
| Input connection                | Heavy Duty Terminal Block |

**DIMENSIONS PER MODULE:**

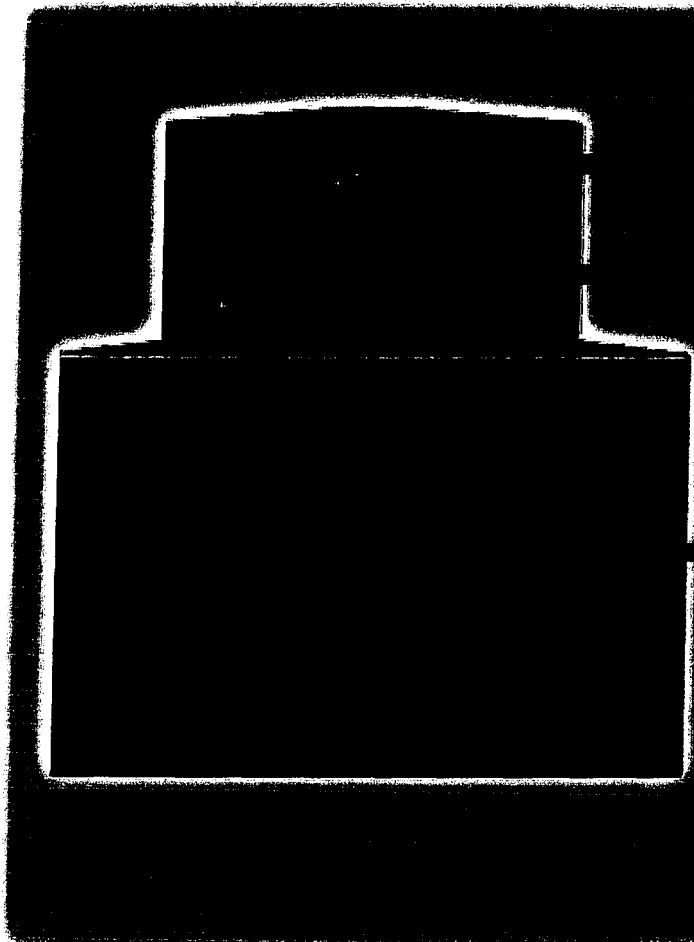
|                |                     |
|----------------|---------------------|
| Width at front | 69 1/4" (173.36 cm) |
| Width at rear  | 32" (81.28 cm)      |
| Height         | 17" (43.18 cm)      |
| Depth          | 44" (111.76 cm)     |
| Weight         | 135 LBS. (61.24 kg) |

**HIGH PERFORMANCE STEREO™**

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**HIGH PERFORMANCE STEREO™ 555**  
**Digital-Ready Motion Picture Loudspeaker**



High performance tweeter maintains proper coverage through a movie screen • Delivers transparent clarity and uniform coverage.

Self-equalized midrange horn • Behind-the-screen reflections eliminated • Natural sounding highly durable phenolic driver diaphragm provides smooth response and perfect dialogue intelligibility • Built-in crossover • HF cabinet available in square or trapezoid configuration.

Highly efficient compact motion picture woofer system • Nearly 6 square feet of low frequency radiating area • Modular construction for easier handling • Specially manufactured HPS® 15 inch driver • Improved throat design • Minimized cabinet resonances • Output matched to the high frequency sections, eliminating the need for bi-amplification.

**SPECIFICATIONS:**

Sensitivity, 1W / 1 M 88 dB  
 Peak Power Capacity > 750 Watts  
 Frequency Response 20 - 16000 Hz ±2.5 dB  
 Minimum Impedance 5 Ohms  
 Nominal Bandwidth 60° H x 40° V\*  
 \*Movie Screen Compensation Included  
 Input connection Heavy Duty Terminal Block

**DIMENSIONS:**

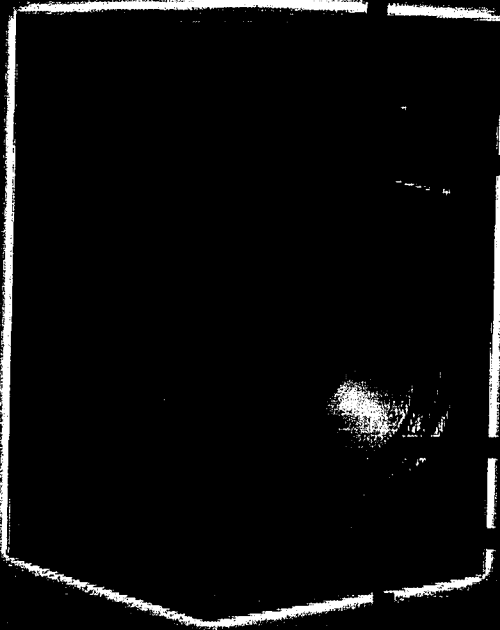
Height 37" (93.98 cm)  
 Width (front of LF) 36.5" (92.71 cm)  
 Width (rear LF & front HF) 24" (60.96 cm)  
 Width (rear HF) 6.5" (16.59 cm)  
 Depth 24" (60.96 cm)  
 Weight Total 136 LBS. (61.67 kg)  
 LF 96 LBS. (45.43 kg)  
 HF Max. 40 LBS. (18.41 kg)

**HIGH PERFORMANCE STEREO™**

NEWTON, MA 02459 USA • TEL: 1-617-244-1737 • E-MAIL: info@hps4000.com

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## HIGH PERFORMANCE STEREO™ SR-70™ 3-Way Digital-Ready Motion Picture Surround Speaker



World's most powerful motion picture surround speaker

- High quality optional finishes
- High density cabinet construction for reduced resonances

- High performance tweeter

- Rugged midrange driver - same type used in HPS® screen speakers
- Exceptionally smooth midrange system
- Rock solid cast metal horn for lower distortion and controlled coverage
- Special horn mountings improve off axis performance - critical for surround speakers

- Custom designed, optimally tuned 12 inch woofer for powerful bass

- Heavy duty barrier strip input connector for years of dependability

- Precision built-in crossover for absolute minimum power loss and proper tone
- No surround equalization required

### SPECIFICATIONS:

|                                   |                          |
|-----------------------------------|--------------------------|
| Sensitivity, 1W / 1 M             | 96 dB                    |
| Peak Power Capacity               | >600 Watts               |
| Frequency Response, 50 - 17000 Hz | ±2.5 dB                  |
| Minimum Impedance                 | 9.8 Ohms                 |
| Input connector                   | Heavy duty barrier strip |

### Finishes available:

Textured black, Oiled walnut, Oiled oak

### Grille cloth colors:

Black, Brown, Beige

### DIMENSIONS:

|                            |                    |
|----------------------------|--------------------|
| Height                     | 22" (55.88 cm)     |
| Width                      | 14 1/4" (36.20 cm) |
| Depth (standard unit)      | 13 3/4" (34.93 cm) |
| Depth ("wall mount" unit)  | 16 1/2" (41.91 cm) |
| Weight (standard unit)     | 48 LBS. (21.77 kg) |
| Weight ("wall mount" unit) | 53 LBS. (24.04 kg) |

### Options:

Custom "wedge" mount  
Whf version: angled cabinet

HIGH PERFORMANCE STEREO™

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BCW VX Series Specifications

| Power Output Per Channel (EIA 190A test method, both channels driven) |   |              |              |              |
|---|---|--------------|--------------|--------------|
|   | VX-440  |              | VX-660       |              |
|   | Stereo Mode   | Bridged Mono | Stereo Mode  | Bridged Mono |
| 8 ohms  | 175 W/ch  | 350 W        | 100 W/ch     | 200 W        |
| 4 ohms  | 75 W/ch   | 150 W        | 45 W/ch      | 90 W         |
| 2 ohms  | 100 W/ch  | 200 W        | 150 W/ch     | 300 W        |
| 70 volts  | 400 W/ch  | 800 W        | 660 W/ch     | 1320 W       |
| <b>Intermodulation Distortion</b>                                     | Less than 0.008% at rated 8 ohm output (SMPTE method, 60Hz & 7kHz, 4:1 ratio)   |              |              |              |
| <b>Rise Time</b>  | 6 $\mu$ s   |              |              |              |
| <b>Slew Rate</b>  | 20 V/ $\mu$ s (stereo mode), 40V/ $\mu$ s (mono mode)   |              |              |              |
| <b>LF Damping Factor</b>  | >100 (8 ohms) below 50 kHz  |              |              |              |
| <b>Small Signal Frequency Response</b>                                | 8 Hz - 56 kHz, +0/-3 dB   |              |              |              |
| <b>THD</b>  | 20 Hz - 20 kHz, +0/-0.3 dB  |              |              |              |
| <b>THD @ 20 Hz - 20 kHz</b>   | < 0.1% @ 20 Hz - 20 kHz   |              |              |              |
| <b>DC Offset Voltage</b>  | < $\pm$ 10 mV (5 mV typical)  |              |              |              |
| <b>Hum &amp; Noise Level</b>  | > 110 dB @ 660 W (unweighted) bal. (8 ohms, 20 Hz - 20 kHz)   |              |              |              |
| <b>Voltage Gain</b>   | 33.4 dB   |              |              |              |
| <b>Input Impedance</b>  | 16 ohms balanced or unbalanced  |              |              |              |
| <b>(@ 8 ohm rated power)</b>  | Balance input between pin 2 & 3   |              |              |              |
| <b>Input Sensitivity</b>  | 0.775 Vrms for rated 8 ohm output   |              |              |              |
| <b>Load Impedance</b>   | = 8 ohms (stereo mode)  |              |              |              |
|   | = 4 ohms (mono mode)  |              |              |              |
| <b>Power Requirement</b>  | VX-660  |              | VX-440       |              |
|   | 13.8 A @ 100 V  |              | 10 A @ 100 V |              |
|   | 11.5 A @ 120 V  |              | 8 A @ 120 V  |              |
|   | 6.7 A @ 230V  |              | 5 A @ 230V   |              |
|   | AC 50-60 Hz   |              |              |              |
| <b>Dimensions Overall</b>   | 5.25 (130) X 19 X 18.8 (inches)   |              |              |              |
| <b>(h x w x d)</b>  |   |              |              |              |
| <b>Dimensions behind front pane</b>                                   | 15.25 X 17 X 18.7 (inches)  |              |              |              |
| <b>(h x w x d)</b>  |   |              |              |              |
| <b>Weight</b>   | 50 lbs (22.7 kg) net, 58 lbs (26.3 kg) shipping (VX-440)  |              |              |              |
|   | 58 lbs (26.3 kg) net, 66 lbs (30.0 kg) shipping (VX-660)  |              |              |              |
| <b>Control</b>  | One 21 position detented rotary control precision input attenuator per channel. One (1) dB attenuation steps.         |              |              |              |
| <b>Switches</b>   |   |              |              |              |
| Limit on/off  | No  |              |              |              |
| Bridged operation   | Yes   |              |              |              |
| dist. mono mode   | Yes   |              |              |              |
| Ground lift   | Yes   |              |              |              |
| subsonic filter   | Yes   |              |              |              |
| pass filter   | Yes   |              |              |              |
| <b>Cooling</b>  | Continuously variable fan speed based on accurate temperature sensing of heatsink modules. Front - to - rear air flow |              |              |              |
| <b>Polarity Convention</b>  | XLR Pin out: pin 2 = + pin 3 = - pin 1 = ground   |              |              |              |
| <b>Warranty</b>   | 3 Years standard, parts/labor   |              |              |              |

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