

# Roadie HD+35K



**User Manual**

020-100340-07



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## NOTICES

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The product is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol  means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of the product appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in!

# Addendum

The CD included with this printed manual contains an electronic copy in English. Please read all instructions before using or servicing this product.

手冊中包含的光盘，带有着中文的电子副本，使用或维修本产品前，请仔细查阅所有的指示。

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# 1 Introduction

This manual is intended for professionally trained operators of Christie high-brightness projection systems. These operators are qualified to replace the lamp and air filter, but should not attempt to install or service the Roadie HD+35K projector. Only qualified Christie technicians who are knowledgeable about the hazards associated with high-voltage, ultraviolet exposure, and the high temperatures generated by the projector lamp are authorized to assemble, install, and service the projector.

## 1.1 Contacting Your Dealer

If you encounter a problem with your Christie projector, contact your dealer. Typically, servicing is performed on site. Complete the information below and keep with your records.

**Table 1.1 Purchase Record**

<b>Dealer:</b>
<b>Dealer or Christie Sales/Service Contact Phone Number:</b>
<b>Projection Head Serial Number*:</b>
<b>First Lamp Serial Number:</b>
<b>Lens Serial Number:</b>
<b>Lamp Ballast Serial Number:</b>
<b>Purchase Date:</b>
<b>Installation Date:</b>

\* *The serial number can be found on the license label located on the back of the projector.*

**Table 1.2 Ethernet Settings**

<b>Default Gateway</b>	n/a
<b>DNS Server</b>	n/a
<b>Projector DLP Address</b>	
<b>Projector Mgmt IP Address</b>	0.0.0.0 (enables use of DHCP server for IP address)
<b>Subnet Mask</b>	255.255.255.0 (fixed)





## 2 Setting Up the Projector

This section provides information and procedures for positioning and installing the projector. You need these items to set up your Roadie HD+35K projector:

- Projection Head including:
  - Power cord
  - Remote Control
  - Security keys for lamp and igniter service access
  - Assorted Allen keys
- Lamp and Lamp Ballast (7 kW)
- Cable kit, (includes 2 lamp power cables and 2 communication and control cables)
- Christie approved protective clothing
- Projector lens
- Rigging frame if used in portrait mode

### 2.1 Safety Precautions

**⚠ WARNING** Never look directly into the projector lens or at the lamp. The extremely high brightness can cause permanent eye damage. For protection from ultraviolet radiation, keep all projector housings intact during operation. Protective safety clothing and safety goggles are recommended when servicing.

**⚠ WARNING** FIRE HAZARD! Keep hands, clothes, and all combustible material away from the concentrated light beam of the lamp.

**⚠ CAUTION** Position all cables where they cannot contact hot surfaces or be pulled or tripped over.

#### 2.1.1 AC/Power Precautions

**⚠ WARNING**

- Use only the locking type AC power cord that is provided with the projector. DO NOT attempt operation if the AC supply is not within the specified voltage and power range.
- As a safety feature the projector is equipped with a three-wire plug with a third (grounding) pin. If you are unable to insert the plug into the outlet, contact an electrician to have the outlet replaced. DO NOT defeat the safety purpose of the grounding-type plug.
- DO NOT attempt operation if the AC supply is not within the rated voltage range, as specified on the license label.
- Disconnect projector from AC before opening any enclosure.
- A 30A maximum double pole, UL listed wall circuit breaker is required for the 7kW switching ballast. It must be part of the building installation and easily accessible.
- A 20A maximum double pole, UL listed wall circuit breaker is required for the projector head. It must be part of the building installation and easily accessible.

**⚠ CAUTION**

- **DO NOT** allow anything to rest on the power cord. Locate the projector where the cord cannot be damaged by persons walking on it or objects rolling over it. Never operate the projector if the power cable appears damaged in any way.
- **DO NOT** overload power outlets and extension cords as this can result in fire or shock hazards.

### 2.1.2 Power Cords and Attachments

**⚠ WARNING** Connect the Christie-supplied line cord to your AC Supply. Do not substitute other cords. At the projection head, install the power cord retaining clip onto the power cord. The power cord and retaining clip provide a reliable ground and protect against electrical shock in the event of an electrical fault. This product can be connected to an IT power distribution system.

**NOTICE:** Use only the attachments and accessories recommended by Christie. Use of unapproved attachments or accessories may result in the risk of fire, shock, and personal injury.

### 2.1.3 Lamp Precautions

**⚠ DANGER** **EXPLOSION HAZARD!** Wear authorized protective safety gear whenever the lamp door is open! Never attempt to remove the lamp directly after use. The lamp is under significant pressure when hot and cold, and may explode, causing personal injury and/or property damage.

#### Protective Clothing

Never open the lamp door unless you are wearing protective clothing such as that included in a Christie Protective Clothing Safety Kit (P/N: 598900-095). Recommended protective clothing includes, but may not be limited to a polycarbonate face shield, protective gloves, and a quilted ballistic nylon jacket or a welder's jacket. **NOTE:** Christie's protective clothing recommendations are subject to change. Any local or federal specifications take precedence over Christie recommendations.

#### Cool the Lamp Completely

**⚠ WARNING** Lamp may explode causing bodily harm or death. Always wear protective clothing whenever lamp door is open or while handling lamp. Ensure those within the vicinity of the projector are also suited with protective clothing. Never attempt to access the lamp while the lamp is ON. Wait at least 15 minutes after the lamp turns OFF before powering down, turning off the breakers/power switches, disconnecting from AC and opening the lamp door.

## 2.2 Projector Parts

These are the primary Roadie HD+35K parts:

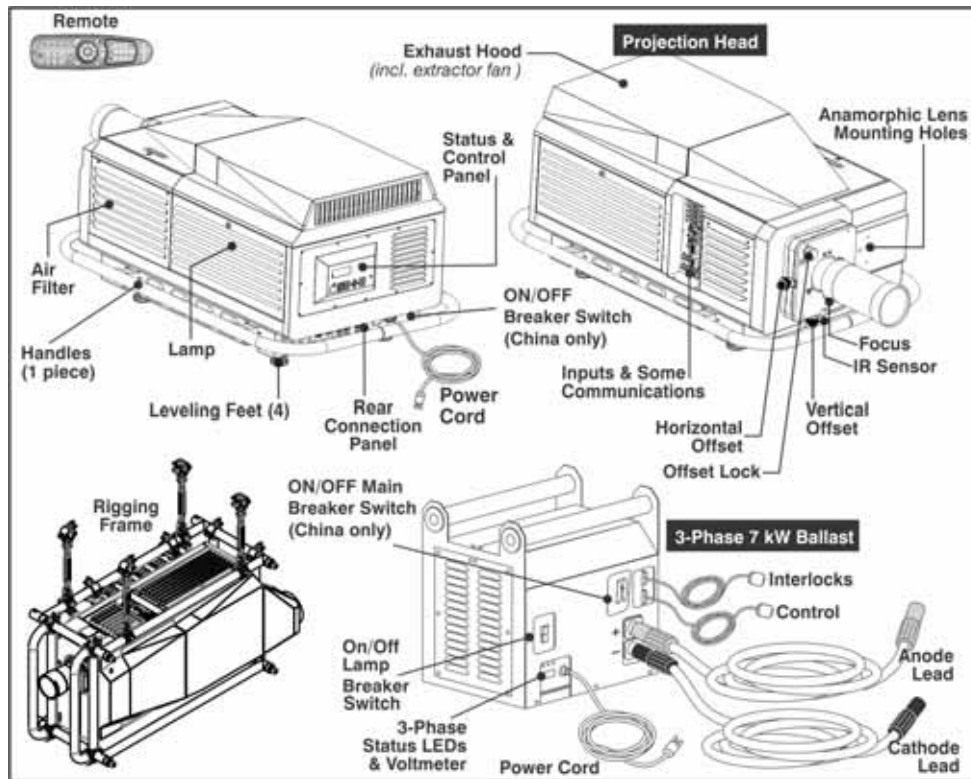


Figure 2-1 Roadie HD+35K Projector and Related Components

### 2.2.1 Air Filter Cover and Air Filter

Intake air is filtered through the air filter before circulating in the front compartment to cool the main electronics. Replace the air filter when you replace the lamp, or sooner in dusty and dirty environments. See [Section 8.6 Replacing the Lamp](#).

### 2.2.2 Breakers/Power Switches (ON/OFF)

The ballast breakers/power switches on the ballast serves two purposes:

1. It is a breaker/power switch for the Roadie HD+35K ballast.
2. It protects against over-current conditions of 50A or more. For China models the rating is 40A or more.

For China models, the projector breaker on the projector head rear panel serves two purposes:

1. It is a breaker/power switch for the Roadie HD+35K projector head.
2. It protects against over-current conditions of 10A or more.

The breakers/power switches must be ON in order to enable normal Roadie HD+35K system power-up and operation. If faulty or major excessive AC is detected, the breakers “trip” to OFF in order to prevent damage. Try switching the breakers/power switches ON again. If the breakers/power switches continues to trip OFF, this indicates a major fault, and the AC problem must be resolved. Possible causes might include shorts, damage to lamp cables, or very excessive AC.

**NOTE:** You must press **POWER** on the built-in keypad as the breaker/power switch do not power up the projector or start the lamp.

The internal ballast fan indicates whether or not both (Main and Lamp) breakers/power switches are ON. There is no other indicator. When the main ballast breaker is ON, lights on the ballast indicate only that the ballast is plugged in.

### 2.2.3 Projector Keypad

The rear control panel includes the projector keypad, infrared sensor, and status displays.

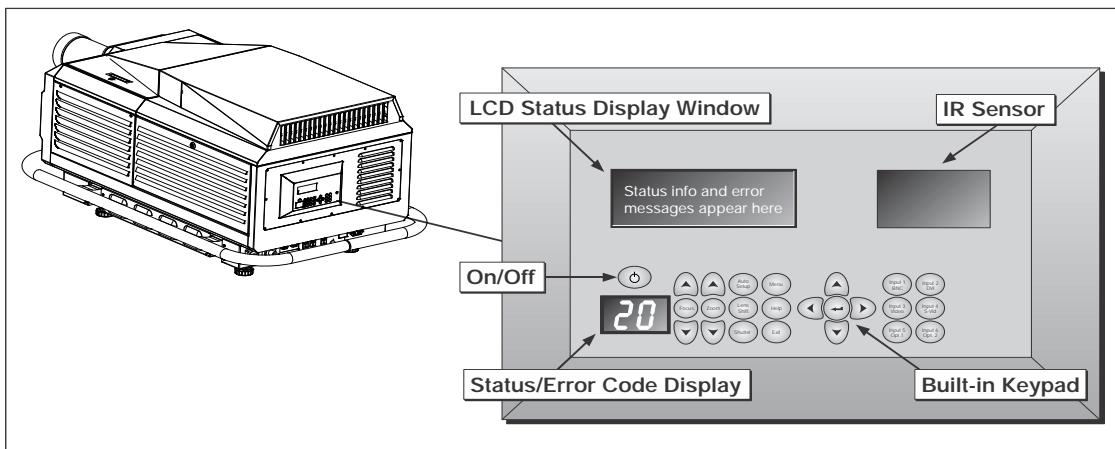


Figure 2-2 Rear Control Panel

Table 2.1 Rear Projector Control Panel

Control Panel Area	Description
Projector Keypad	Provides access to projector menus.
Infrared Sensor	Detect commands from the remote.
Two-Digit Status/Error Code Window	Displays the operational state of the projector.
LCD Status Display	Displays status and error messages.

### 2.2.4 Handles

Use the projector handles to move or hoist the projector. If you install the projector in an elevated position, the support system must have a weight rating sufficient to hold the projector.

The projector weighs 197.3 kg (435 lb).

If you are using a FredFrame™ to stack projectors, remove the handles to allow the FredFrame™ to be installed. For FredFrame™ installation instructions, see the FredFrame™ instructions included with the FredFrame™ Kit.

### 2.2.5 Lens Mount and Projection Lenses

With the projector keypad or the remote, you move the motorized lens mount to adjust vertical and horizontal offsets, zoom, and focus. A variety of optional lenses can be installed in the projector.

See [Section 2.5 Install the Lens](#) for a list of available lenses.

You can install an optional anamorphic lens next to the primary lens.

### 2.2.6 Input Panel

Connects input sources to the projector.

### 2.2.7 Lamp

These are the lamps that you can install in the Roadie HD+35K projector:

- 2.0 kW
- 3.0 kW
- 4.5 kW
- 6.0 kW

Keep the lamp door closed and locked. Only Christie accredited service technicians are authorized to work with the lamp.

### 2.2.8 Leveling Feet

Adjusts the tilting angle of the projector.

### 2.2.9 DC Power Cables

Supplies DC power to the projector.

### 2.2.10 Projection Head

Houses illumination and optical components necessary for producing high-resolution digital displays. Keep the projection head closed and locked during normal operation.

### 2.2.11 Connection Panel

The connection panel on the rear of the projector connects the projector to AC power, to external controllers, and to the other Roadie HD+35K accessories.

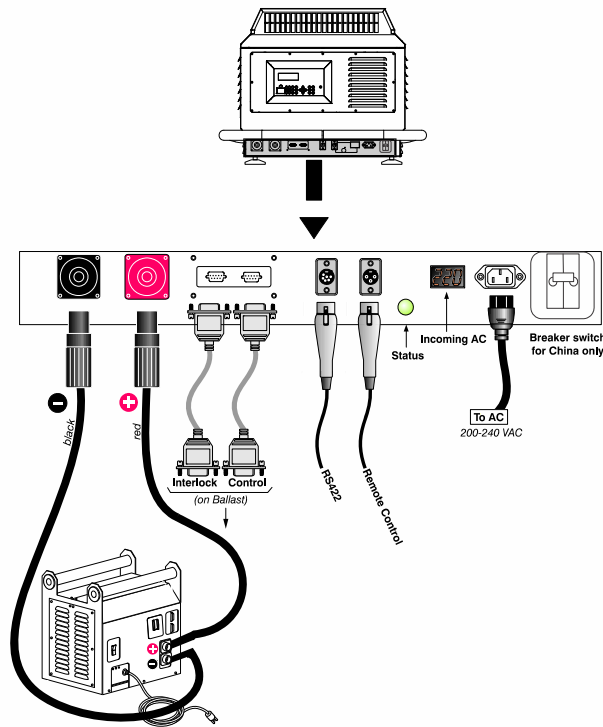


Figure 2-3 Rear Connection Panel Layout

Rear Panel Connections	Description
<b>CATHODE/ANODE Connectors</b>	Connects the projector to DC power from the lamp ballast.
<b>BALLAST INTERLOCKS</b>	Allows the projector to receive safety interlock signals and the Lamp Enable signal from the lamp ballast.
<b>BALLAST CONTROL</b>	Allows the projector to receive a specific power level from the lamp ballast.
<b>RS422</b>	Connects the projector to input sources with compatible RS-422-serial connections. This port cannot be used to download new projector software.
<b>REMOTE</b>	Connects the remote to the projector.
<b>VOLTMETER</b>	Displays the number of AC volts reaching the projector. The acceptable nominal AC range is 200-240).
<b>PROJ. STATUS</b>	Indicates the operating state of the projector. These are the display options: Off = Projector is unplugged Yellow = Projector is plugged in, but turned off Green = Normal operation Red = Error
<b>AC INPUT</b>	Connects the projector to AC.

### 2.2.12 Security Locks

Prevents unauthorized access to projector components.

## 2.3 Positioning the Projector

Your room layout and screen type determine which installation position provides the best image. When you install the projector consider the size and position of your screen, the location of your AC power source, and the location and distance between the projector and the rest of your equipment.

### 2.3.1 Front Screen Installations

In front screen installations, the projector and audience are positioned in front of a flat or curved screen that is between 1.5 m (5 ft) and 45 m (150 ft) wide. Curved screens have a gain greater than 1.0 with a viewing angle less than 180 degrees. This type of screen does not reflect incident light equally in all directions; it is concentrated in a viewing cone. The audience sitting within the viewing cone see a brighter image than those outside the viewing cone. See [Figure 2-4](#).

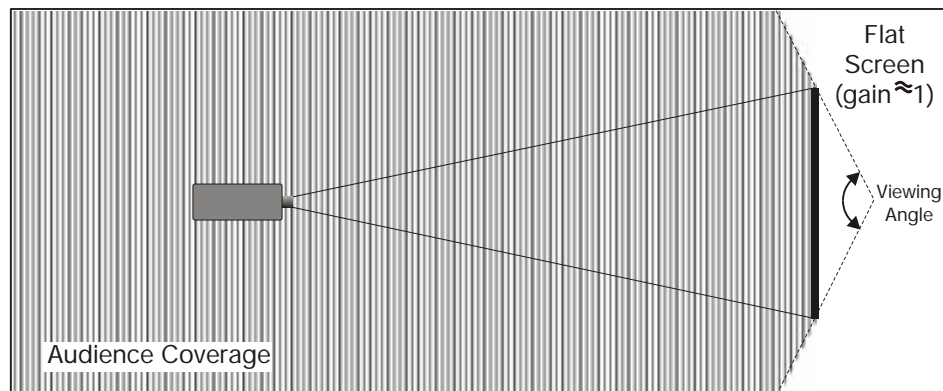


Figure 2-4 Audience Coverage with a Flat Screen

**NOTE:** *Roadie HD+35K lenses are designed primarily for use with flat screens. However, the projector's depth-of-field range allows the lens to be focused on curved screens. While focus remains sharp in the corners, there may be significant pincushion distortion at the top of the screen.*

### 2.3.2 Rear Screen Installations

These are the two types of rear screen installations:

- **Diffused** - A diffused rear screen has a surface that spreads the light striking it. Purely diffused screens have a gain of less than 1.0. The advantage of the diffused screen is its wide viewing angle, similar to that of a flat screen for front screen projection. This type of screen is suitable when a wide viewing angle is required but there is low ambient room lighting.
- **Optical** - An optical rear screen takes light from the projector and redirects it to increase the light intensity at the front of the screen. This reduces it in other areas, and creates a viewing cone similar to that of a curved, front screen installation. This type of screen is better suited for brightly lit rooms when the audience is seated within the viewing cone.

### 2.3.3 Screen Size

The maximum screen width for a *Roadie HD+35K projector* is 45 meters (150 ft). Choose a screen size appropriate for the projector lens and application. If you are using the projector to display text, the image size must allow the audience to read the text easily. The eye sees a letter clearly if the eye-to-text distance is less than 150 times the height of the letter. Small text located too far from the eye is illegible no matter how sharply and clearly it is displayed.

**NOTE:** Screens with aspect ratios of 4:3 are typically specified by diagonal size, but screens with aspect ratios such as the 2048 x 1080 are usually specified by their horizontal width. See [Table 2.2](#) below:

**Table 2.2 Matching Lens to Screen Size**

Lens Type	Screen Width(< - >)
0.8:1 fixed	5 - 3 ft.
1:1 fixed	14 - 150 ft.
1.25 - 1.45:1 zoom	10 - 121 ft.
1.45 - 1.8:1 zoom	8 - 102 ft.
1.8 - 2.4:1 zoom	6 - 83 ft.
2.2 - 3.0:1 zoom	5 - 66 ft.
3.0 4.3:1 zoom	3 - 49 ft.
4.3 - 6.0:1 zoom	2.5 - 35 ft.
5.5 - 8.5:1 zoom	2 - 27 ft.

### 2.3.4 Vertical and Horizontal Position

The projection lens and the screen type determine the vertical and horizontal position of your projector in relation to the screen. Ideally, you should position the projector perpendicular to the screen to make the image appear rectangular instead of keystone (trapezoidal).

You can offset the vertical position of the image (that is moved above or below the optical axis) with the projector keypad or the remote. The amount of vertical offset available depends on the type of lens installed in the projector and can be limited if you have applied horizontal offset.



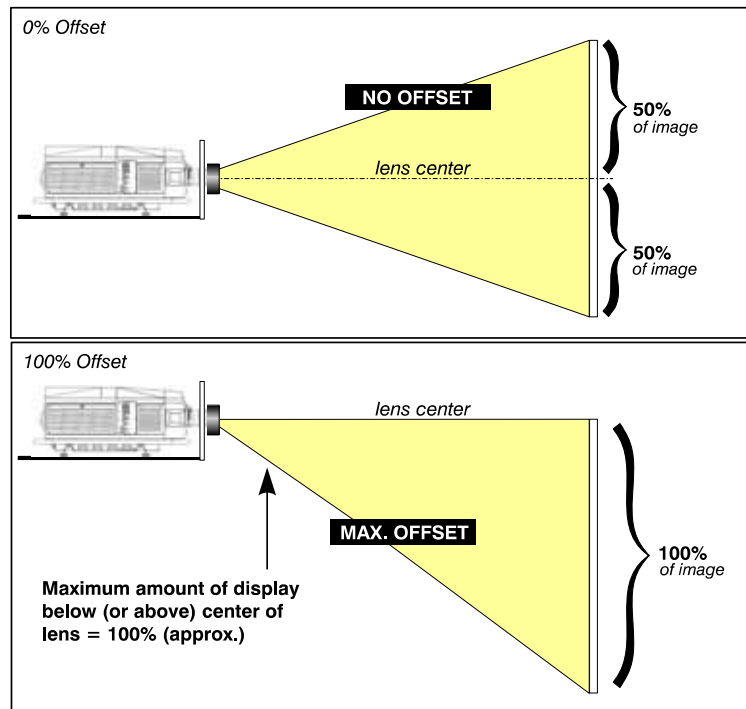


Figure 2-5 Vertical Offset Range

Offset can also be specified as the **distance traveled** from lens center (such as 270 pixels) and expressed as a percentage (270 pixels=50%) of **half of the image height**. The concept of image movement is illustrated in this image:

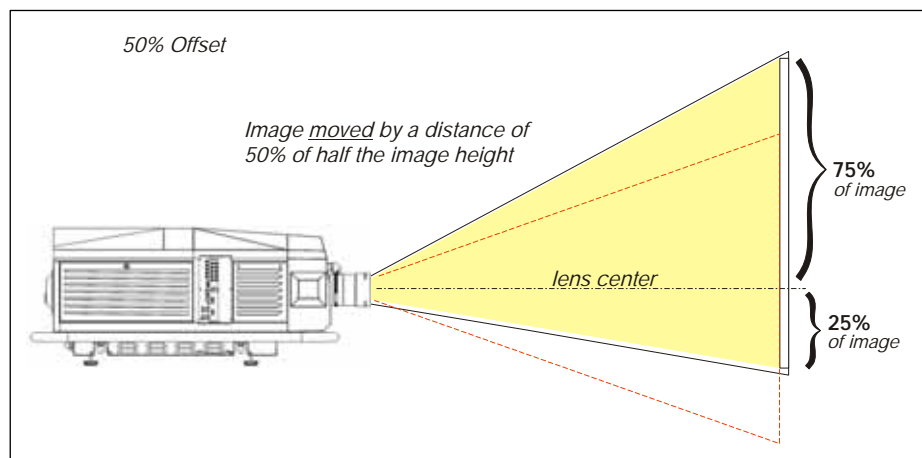


Figure 2-6 Example of Alternative Offset Specification

If you cannot raise or lower the image enough by using mechanical vertical offset, open the **Size and Position** menu and adjust the **V-Position** value (see [Section 6.5 Image Settings Menu](#)). If images remain keystoneed or exhibit uneven brightness, raise or lower the projector.

The image can be offset horizontally (shifted left or right of lens center) by using the projector keypad or the remote. You can move images on the *Roadie HD+35K* a distance of up to  $\pm 35\%$  of the image width. The amount of horizontal offset available depends on the lens installed and if the image has already been vertically offset.

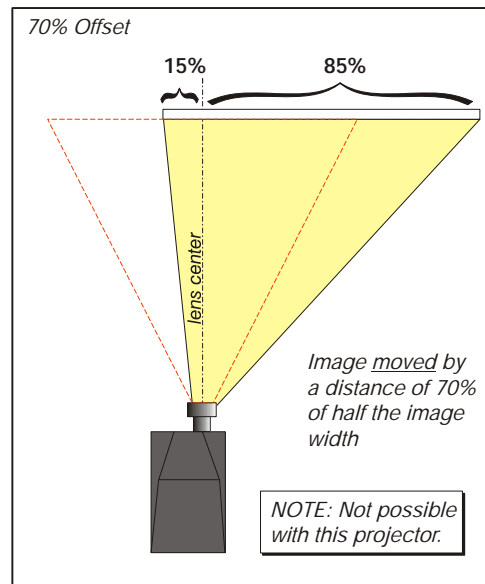


Figure 2-7 Horizontal Offset Range

Horizontal offset can be expressed as the percent of half the image width or the number of pixels of shift to one side of lens center. For example, an offset spec of 70% means a centered image can be moved by a distance of 540 pixels, resulting in 85% of the image projected to one side of lens center and 15% on the other.

See [Figure 2-7](#).

### 2.3.5 Floor Mounting

If you are not installing the *Roadie HD+35K* overhead, use a strong supporting structure or cart. If you are using a mobile cart, avoid sudden stops and uneven surfaces that can cause the cart to overturn. If you are using a stationary structure, it should be level and have a weight rating sufficient to support the projector.

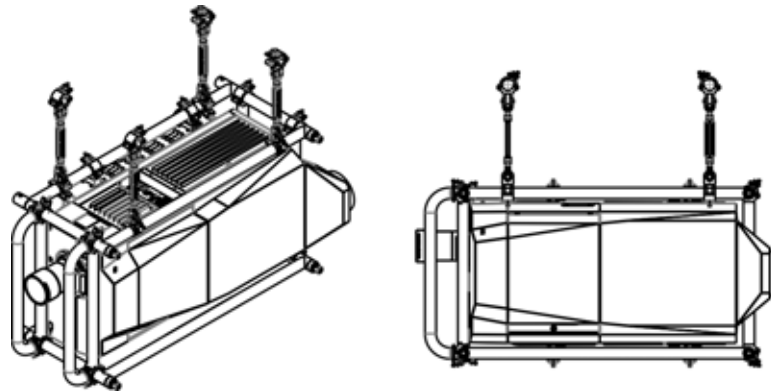
**⚠ WARNING** Do not invert this projector.

### 2.3.6 Portrait Mode

The Christie portrait upgrade kit (113-112105-XX) is required when installing Christie projector models 113-003104-01 or 38-DCP400-XX in portrait mode. The Christie portrait upgrade kit is not required for model 113-003104-02 and later projectors. When you install the *Roadie HD+35K* projector in portrait mode, suspend it in a Christie rigging frame (38-814007-XX) so the intake and exhaust vents are not obstructed.

**NOTE:** You must perform a lamp alignment after installing a projector in portrait mode.

**⚠ WARNING** For portrait mode, install the lens in the orientation shown below. Failure to orient the lens correctly can damage the projector. The maximum tilt angle is  $\pm 15$  degrees.



### 2.3.7 Lifting a Projector Into an Elevated Position

Four or more people are required to lift and carry one projection head a short distance with the integrated handles or the optional FredFrame™.

To lift a single projection head into an elevated installation location, use the integrated handles, a set of rigging clamps (PN#113-102101-xx), and rigging and safety cables. If you are stacking multiple projectors in an elevated installation location, you must use an optional FredFrame™. See [2.3.8 Lifting and Stack Projectors with the FredFrame™](#).

Before you lift or suspend a *Roadie HD+35K* projector, read the instructions in their entirety and heed all safety warnings.

**⚠ CAUTION** When installing the *Roadie HD+35K* projector overhead, the device holding the projector must have a weight rating sufficient to hold the weight of the projector. The projector’s weight is 197.3 kg (435 lb).

**⚠ WARNING** The maximum load rating for the integrated projector handles is 197.3 kg (435 lb). When lifting the *Roadie HD+35K* into an elevated position, supplement the projector handles with straps or cables with a weight rating sufficient to hold the weight of the projector. Never exceed the specified load rating.

**⚠ CAUTION** Do not carry more than one projector at a time.

**⚠ WARNING** Remove the projection lens before lifting the projector.

To lift a single projector into an elevated position with the integrated handles:

1. Remove the projection lens. See [Section 8.8 Replacing a Lens](#).
2. Attach the 4 rigging clamps to the projector handles. Allow a minimum clearance of 12 inches between the clamps for proper stability. To ensure the rigging clamp can swivel freely, do not tighten the cross bolt of the clevis arms.
3. Attach the 4 rigging clamps to the support structure.
4. Attach two safety straps to the projector. Use one safety strap per cross beam, and route the strap through the bottom 2 eyebolts and bring them up, and around the outside of the handles.

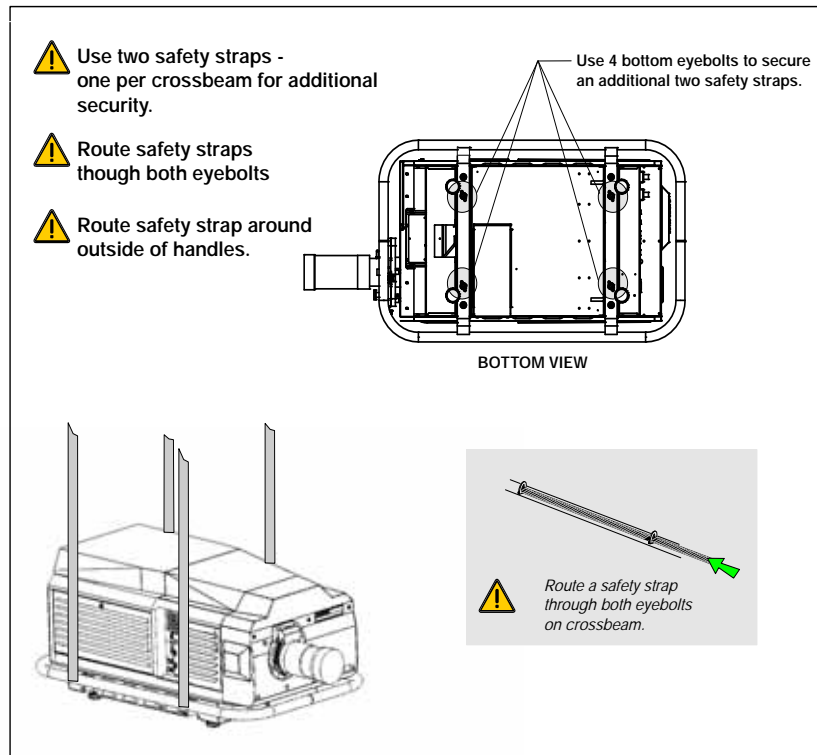


Figure 2-8 Using Safety Straps

5. Install the projection lens and secure it with the safety ring and tether strap. See [Section 2.5 Install the Lens](#).

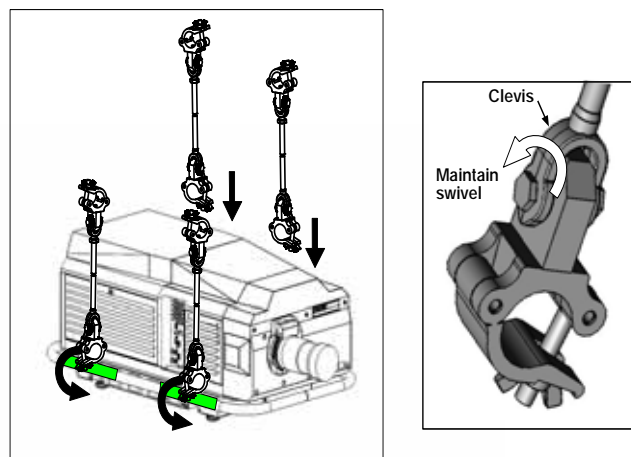


Figure 2-9 Securing Clamps to the Projection Head

- ⚠ WARNING** 1) A minimum of 4 rigging clamps are required to suspend a single projector. 2) Always install redundant safety straps or cables. 3) Observe load ratings and all local applicable safety codes.

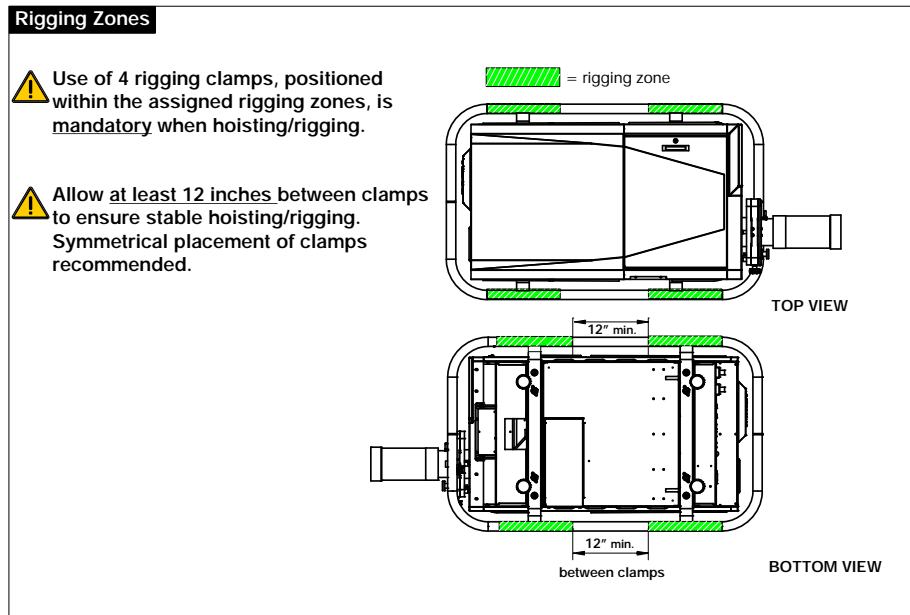


Figure 2-10 Rigging Zones on Projector Handles

### 2.3.8 Lifting and Stack Projectors with the FredFrame™

To use the optional FredFrame™ (PN 38-814007-xx) to lift, stack, or suspend projectors you must remove the projector handles and secure the projector within the FredFrame™. Use the rigging clamps (P/N 113-102101-xx) to raise and suspend the projector in the FredFrame™.

If you are lifting the projector with a fork lift, you must install the forklift rails on the bottom of the FredFrame™. If you attempt to lift the projector without the forklift rails, the base of the projector can be crushed and damage internal components.

To stack two projectors, secure each projector within a FredFrame™, and then use the 4 stacking pins included with the FredFrame™ kit to secure all corners of the frames together. Do not stack more than 2 projectors. To move stacked projectors, follow the instructions in the FredFrame™ kit.

For complete instructions on using the FredFrame™, refer to the instruction sheet included with the FredFrame™ kit.

- ⚠ WARNING** 1) Use straps and cables with a load rating that is sufficient for the projector and FredFrame™. 2) Remove the lens before lifting. 3) Never exceed the load rating specified in the FredFrame™ instructions.

### 2.3.9 Adjust the Feet

To change the height of the projector, you turn the feet on the bottom of the projector left or right. See [Figure 2-11](#).

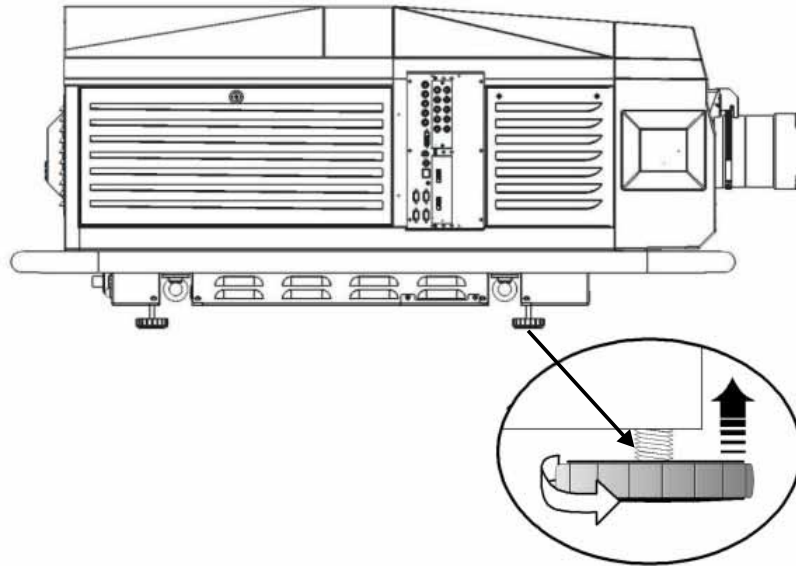
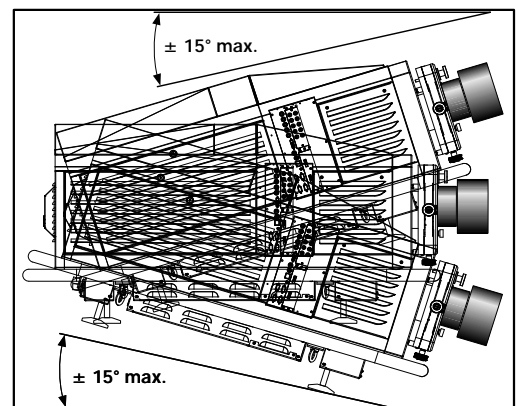
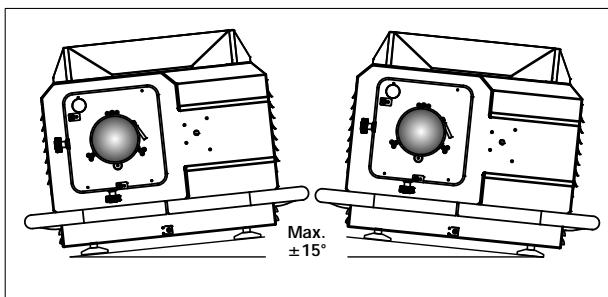


Figure 2-11 Adjusting the Feet

### 2.3.10 Tilt the Projector

The maximum upward or downward tilt angle for the front of the projector is 15 degrees. The maximum side-to-side tilt of the projector is 15 degrees. These limits ensure safe lamp operation and the proper positioning of the liquid cooling reservoir in the projector.



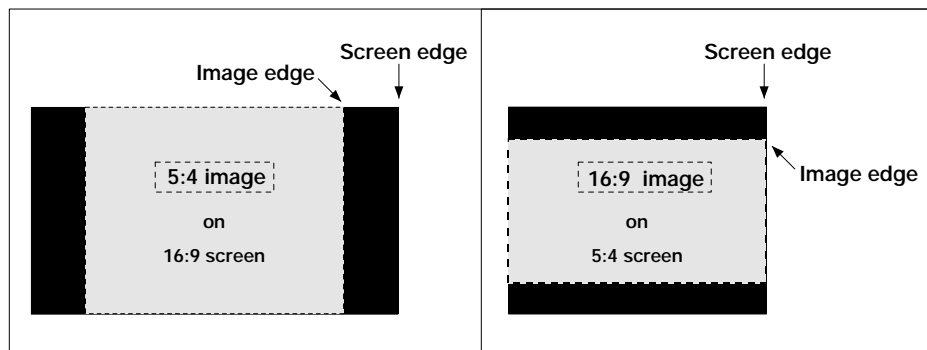
**2.3.11 Screen Aspect Ratio**

Aspect ratio describes the proportion of the display and is expressed as the ratio of width to height, such as "5:4" or "16:9". Typical aspect ratios range from 1.25 to 2.35, the higher the value, the wider or "less square" the image. See [Table 2.3](#) below.

**Table 2.3 Typical Aspect Ratios**

APPLICATION	ASPECT RATIO
SXGA	1.25 (5:4)
35mm filmstrip	1.32 (4:3)
NTSC Video/XGA	1.33 (4:3)
PAL Video/XGA	1.33 (4:3)
HDTV Video	1.78 (16:9)
Letterbox Video/"Flat"	1.85 (2048 x 1080)
Roadie Native Resolution	1.89 (2048 x 1080)
Cinemascope	2.35

Although image size and aspect ratio can be adjusted using projector software, it is recommended that you use a screen with an aspect ratio that closely matches the content of the input source. For example, to display a VCR output with a 4:3 aspect ratio onto a 3 m (10 ft) high screen, the width of the screen must be at least 4 m (13.3 ft).



**Figure 2-12 Aspect Ratios**

Black bars appear on both sides of the image when the screen is wider than the source material. Black bars appear above and below the image when the source material is wider than the screen.

If the area of unused pixels is minimal, use the projector software to stretch the image horizontally or vertically without distorting the image.

### 2.3.12 Display Flat and Scope Images

Flat and scope displays differ in their width-to-height aspect ratio as shown below:

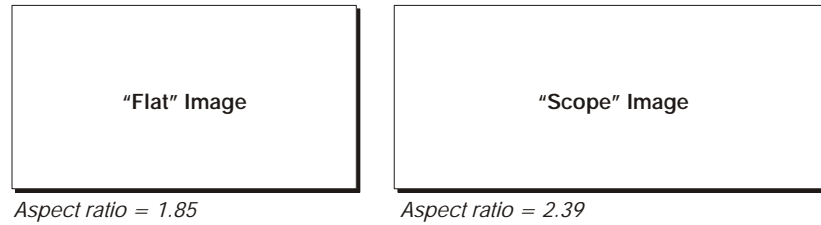


Figure 2-13 Typical Wide Formats

The native resolution of the projector (1.89) closely matches the aspect ratio of flat source material (1.85). Scope source material may be electronically distorted so that it fits into a narrower area. An anamorphic lens is used to stretch the image pixels horizontally to regain the full and properly proportioned 2.39 display. This optical widening can stretch the image by approximately 25%.

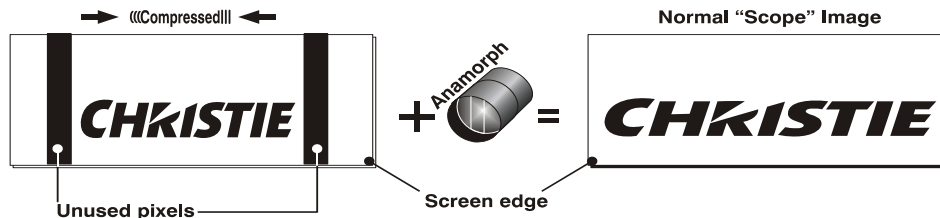


Figure 2-14 Typical Method for Achieving "Scope"



### 2.3.13 Masking

You use masking to conceal the unused edges of a screen. These are the two types of masking:

- **Top Masking** – Movable flat black panels or curtains are installed along the top edge of the screen. You raise the curtain for flat images, and you lower the curtain for scope images.
- **Side Masking** – Movable flat black panels or curtains are installed on each side of the screen. You close the curtain for flat images, and open the curtain for scope images.

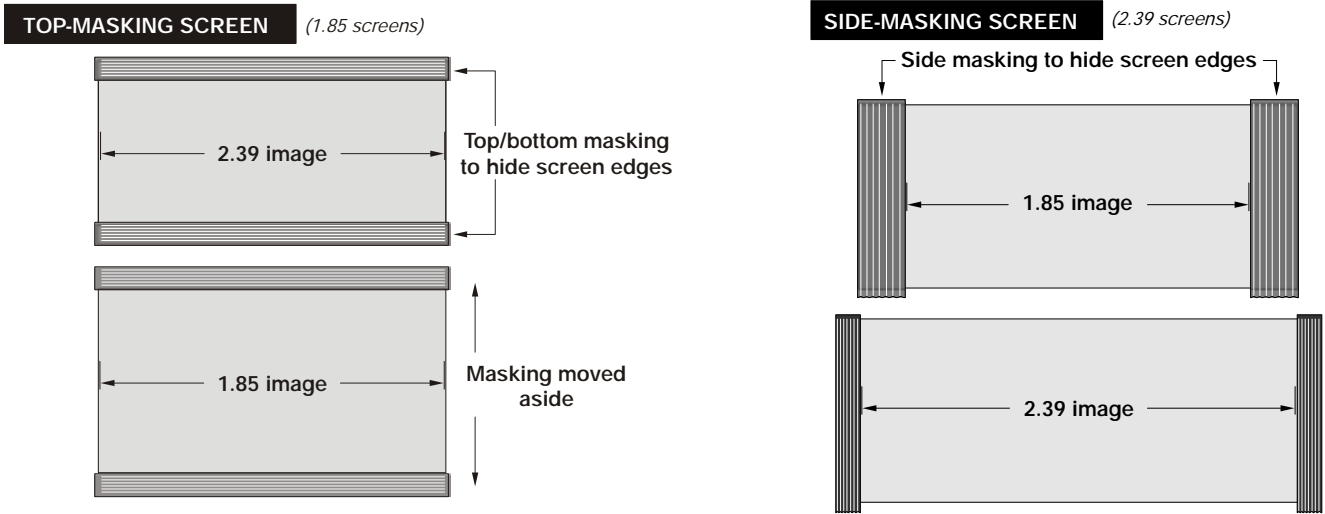


Figure 2-15 Side and Top Masking

Screen Type	"All the Pixels All the Time"	Quickest Scope --> Flat
<b>SIDE-MASKING SCREEN</b> (2.39 screens)	+ Masking = Flat + Anamorph = Scope	Horizontal Compression (1700 across) + Anamorph + Masking = Flat Horizontal Compression (2048 across) + Anamorph = Scope
<b>TOP-MASKING SCREEN</b> (1.85 screens)	Flat + Anamorph + Masking = Scope NOTE: Example shows vertical offset	Flat Re-size electronically with source and screen settings = Scope
<b>EXTRA SHORT THROW</b> and <b>FIXED SIDE MASKING</b>	Horizontal Compression (1700 across, approx.) 1280 --> 1700 (approx.) Compressed + ZOOM <sub>out</sub> + Anamorph = Flat 1280 --> 2048 (Masking) Compressed + ZOOM <sub>in</sub> + Anamorph = Scope Top and/or bottom masks present	Flat Scope

Figure 2-16 Switching between Flat and Scope Displays

### 2.3.14 Ambient Lighting

The *Roadie HD+35K* projector is recommended for locations with low ambient lighting. The contrast ratio of projected images is reduced when light directly strikes the screen. Eliminate all stray light sources from the viewing area.

### 2.3.15 Throw Distance

Throw distance is the distance from the front of the projector to the screen. This calculation determines if there is enough room to install your projector and if the image is the right size for your screen.

To estimate the throw distance, multiply the horizontal width of the screen by the lens throw ratio. The result determines the approximate distance you should position the projector from the screen to project a focused image that is large enough to fill the screen. For example, if you are using a 0.73:1 lens, the throw distance would be approximately 0.73 x the screen width.

*To calculate the throw distance accurately, use the Christie Digital Lens and Throw Distance Calculator on the Christie Web site. Due to lens manufacturing tolerances for lens focal length, the actual throw distance can vary ±5% or more between lenses with the same nominal throw ratio.*

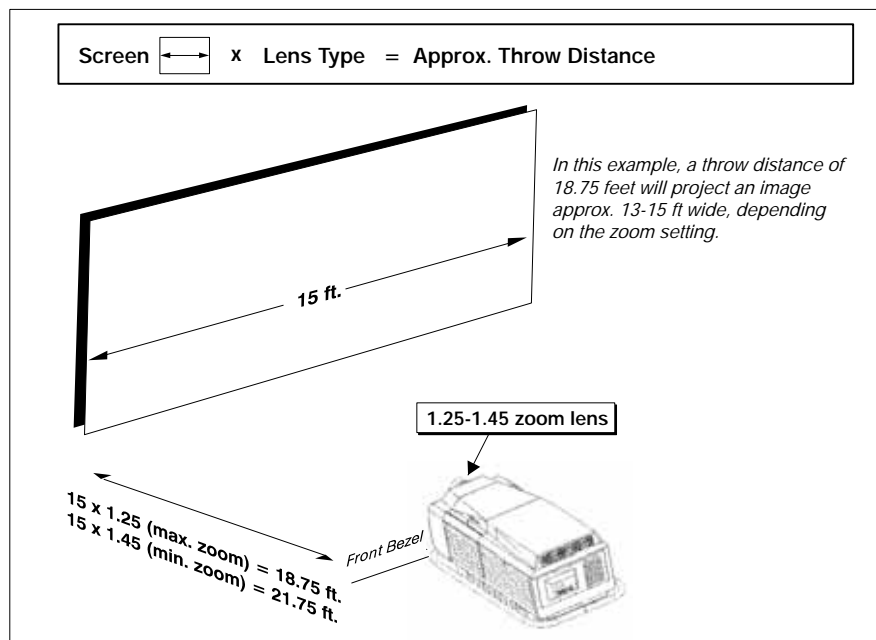


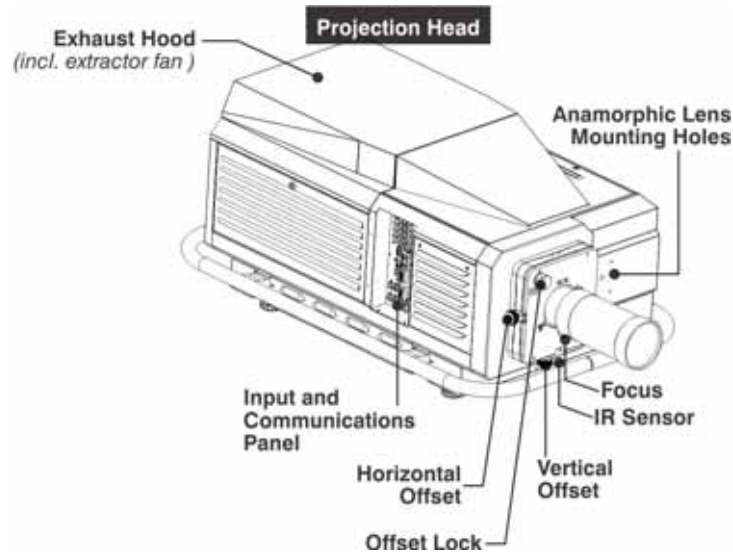
Figure 2-17 Estimating Throw Distance

### 2.3.16 Other Considerations

Other considerations and tips that can help improve your installation:

- Keep the ambient temperature constant and below 35°C (95°F). Changes in temperature may cause drifts in the projector circuitry that may affect performance.
- Install the projector away from heating and air conditioning vents.
- Install the projector away from devices that radiate electromagnetic energy such as motors and transformers.
- Use a screen size appropriate for the venue, but not larger than required. Installing a large screen in a small space can overpower a venue. It is recommended that viewers sit no closer than 1.5 times the screen width.

**2.4 Install the Projector**



1. Position the projector at an appropriate throw distance and vertical position from the screen. Make sure that the projector is level from side-to-side, and is not inverted.
2. Install the lens. See [Section 2.5 Install the Lens](#).
3. Install the lamp. See [Section 2.8 Install the Lamp](#).
4. Connect an input source to a port on the input panel on the side of the projector.
5. Install the lamp ballast so the 4 cables reach the rear of the projection head.
6. Connect the lamp ballast to the projector:

- a. Connect the 2 DC power cables and 2 communication and control cables to the rear of the projector.

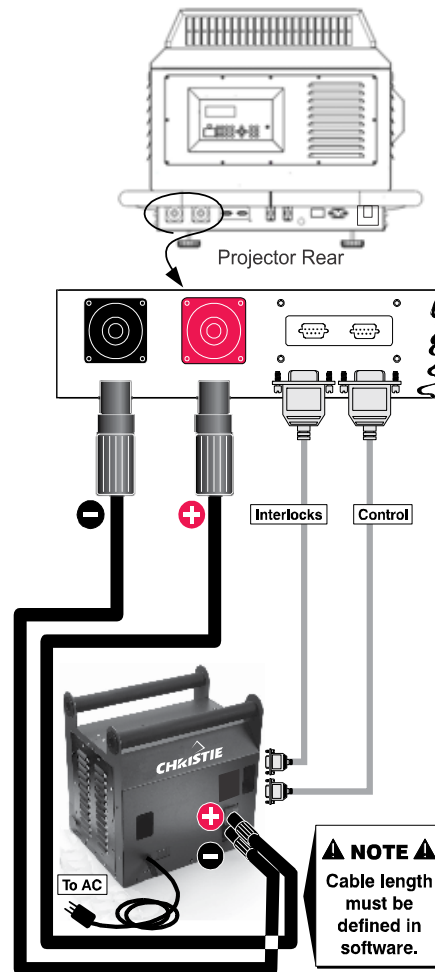
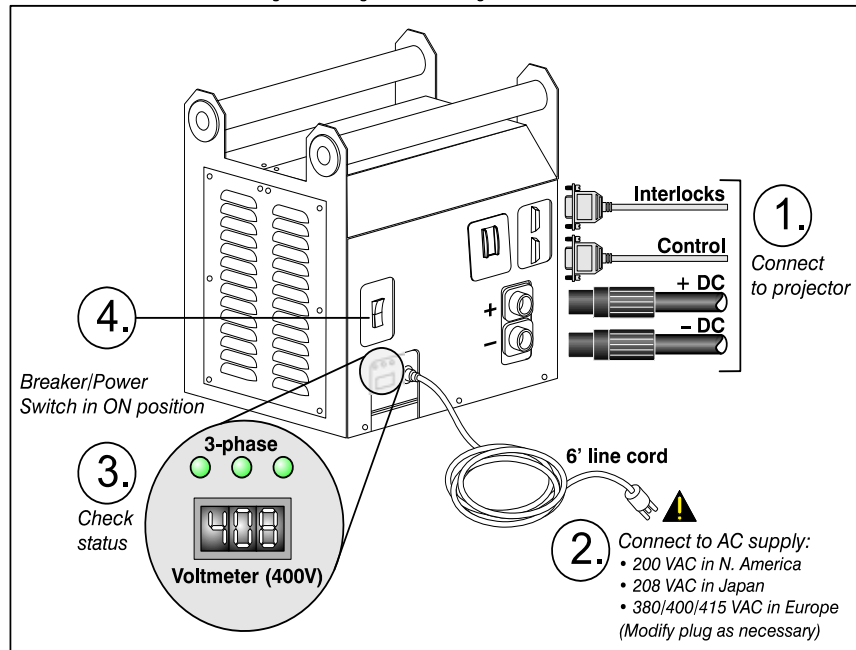


Figure 2-18 Connecting the Lamp Ballast to the Projector

- b. Connect the lamp ballast power cord to an AC supply.  
**NOTE:** Before you connect the ballast power cord to AC power, a Christie accredited service technician must verify the ballast power cord plug and input power range switch match the line voltage at the installation location.
- c. Confirm the status lights on the lamp ballast are on and that the adjacent voltmeter displays the correct AC level for your location. **NOTE:** For China models the main ballast breaker must be in the ON position (the Lamp Breaker can be Off).
- d. Turn the ballast breakers/power switches ON.

**NOTE:** The ballast's internal fan is the only indication whether or not the breakers/power switches are ON. Lights on the ballast indicate only that the ballast is plugged in.

**⚠ NOTE:** Internal *Incoming Line Voltage* switch setting must match AC available at the site.



**FIGURE 2-19** LAMP Ballast Connection and Power Switch

7. Connect the projector power cord to an AC supply.

The projector is now in standby mode. The voltmeter displays the incoming voltage, the PROJ. STATUS light is yellow, and the light engine compartment fans are running.

**NOTE:** Use only the locking type AC power cord that is provided with the projector.

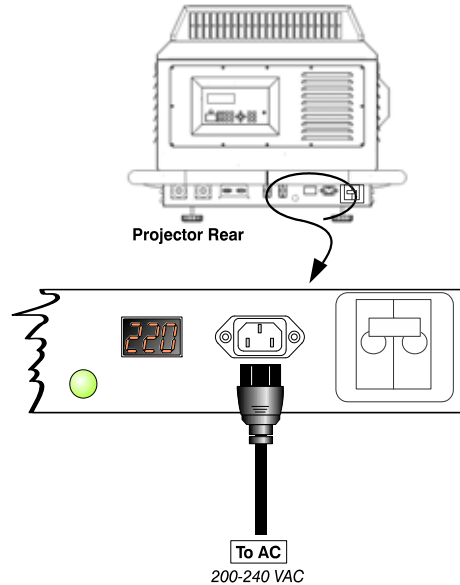


Figure 2-20 Connecting the Projection Head to AC

**⚠ WARNING** Do not operate the projection head if the AC level is not within the specified voltage and power range.

8. Set the lamp type:

**⚠ WARNING** Explosion hazard. Keep the projection head off until you define the lamp type installed.

- a. Press MENU.

- b. Enter the lamp password with the projector keypad.

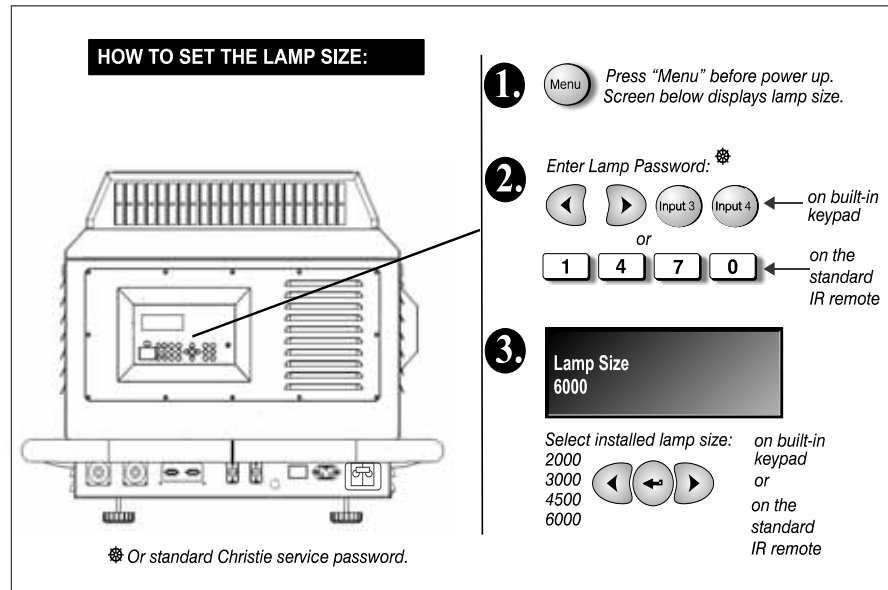


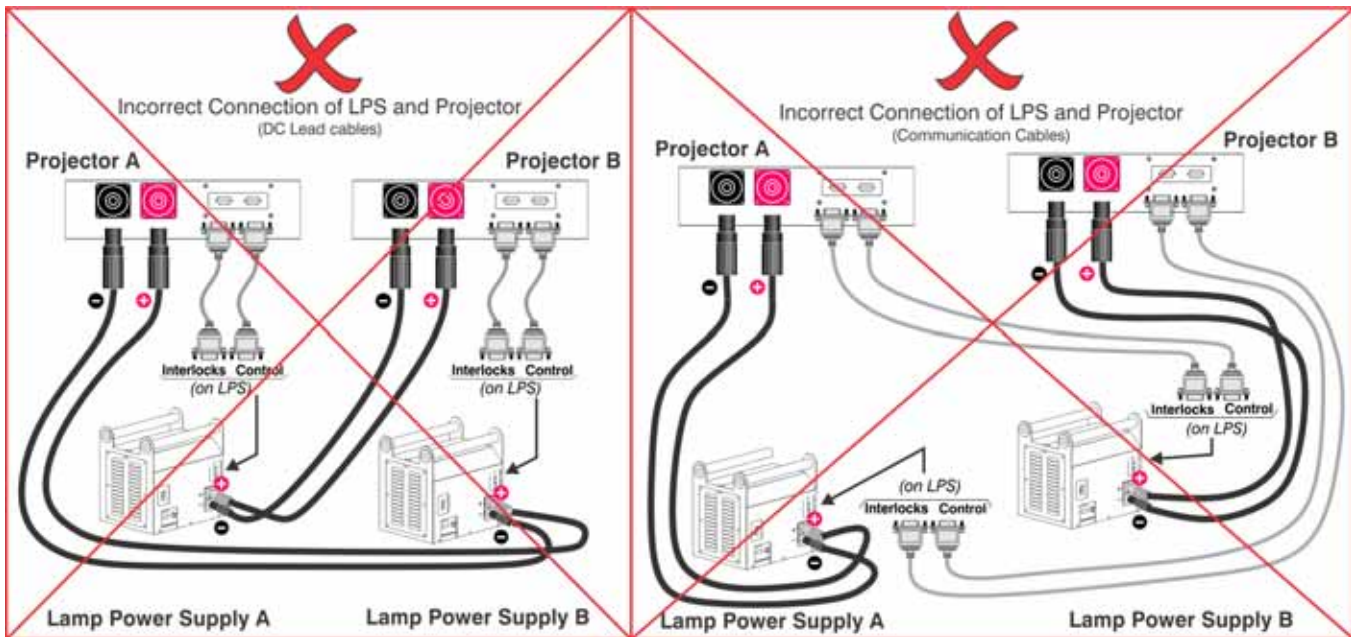
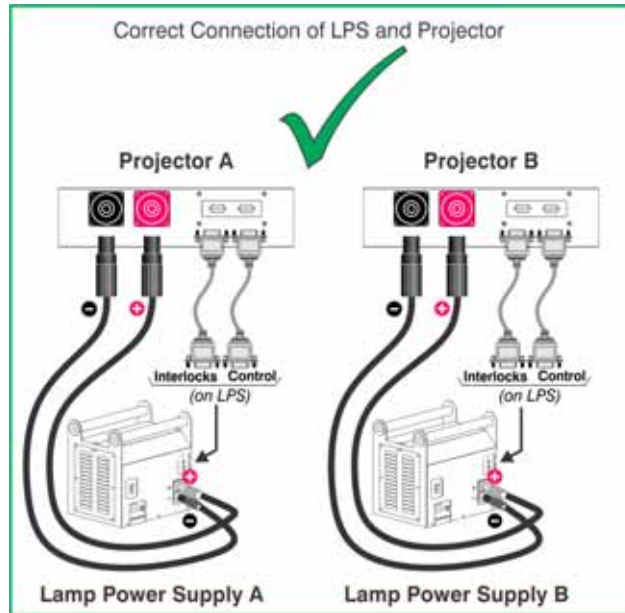
Figure 2-21 Setting the Lamp Type

- c. Use the up and down arrows to select a lamp size.
  - d. Enter the lamp size listed on the Lamp Installed label located above the lamp door.
9. Turn the projector on, and ignite the lamp:
    - a. On the keypad, press **POWER** and then **UP**.
    - OR-
    - b. On the remote, press **POWER** and then **UP**. The PROJ. STATUS light on the rear of the projector illuminates.
  10. Let the projector warm up for a minimum of 10 minutes.
  11. On the remote or the projector keypad, press the **Input** key (1-6) to display the image for the input source.
  12. Use the remote to adjust the brightness, contrast, and gamma settings.
  13. Press **Focus** on the remote or the projector keypad to focus the image.
  14. Press **Zoom** to increase or decrease image size (not available with fixed 0.8:1 and 1:1 lenses).
  15. Press **Lens Shift**, and the ARROW keys to move the image.
  16. Open the **Lamp** menu and set the **Cable Length (m)** setting to the length of the high-voltage DC cables that run from the lamp ballast to the projection head. This setting ensures that adequate voltage reaches the lamp. If you are using the same projector in multiple, temporary installations, you must update this setting every time you install the projector.

### 2.4.1 Multiple Projector Operation

**⚠ DANGER** Fire Hazard! To avoid a fire hazard for multiple projector operation, make sure the high current DC Leads and interlocks/control cables are correctly connected between the Lamp Power Supply (LPS) and its corresponding projector. **DO NOT** cross-connect one set of cables from one LPS to a second projector.

Repeat [Section 2.4 Install the Projector](#) for each additional projector in multiple projector operations. Christie recommends that the units **MUST NOT** be operated until the installation has been verified as correctly connected. Use this diagram to determine if the connections between the projector head and LPS are correct:





To confirm that the cross-connection has not occurred, power only one LPS and projector pair at a time. DO NOT power multiple LPS and projector heads simultaneously. Before you turn on multiple projectors, you must confirm each projector head and lamp power supply are connected and operating correctly.

## 2.5 Install the Lens

The lens seals the projection head, preventing contaminants from entering the main electronics area. Do not operate the projector without a lens installed. Install a lens plug when you install or transport the projector. Always re-install a lens in its UP orientation, otherwise boresight may require re-adjustment.

To install the lens:

1. Remove the rear lens cap from the lens.
2. Rotate the lens clamp to the OPEN position.
3. With the *UP* label facing up, insert the lens straight into the lens mount opening all the way back, without turning.

**NOTE:** Inserting the lens at an angle can cause damage the lens or the projector.

4. Move the lens clamp to the *DOWN* position to lock it in place.
5. Attach a tether to the lens and then connect the tether to the projector handle or the FredFrame™. A tether is not required if projector is floor-mounted.

**⚠ WARNING** If the lens is dropped, replace the tether. Failure to do so could result in injury or death.

6. Remove the front lens cap.
7. On the **Main** menu, tap **Configuration > Diagnostics and Calibration**.

**⚠ CAUTION** Lens calibration must be performed each time a new lens is inserted or after performing manual lens mount adjustments. To calibrate the lens, select the **Configuration > Diagnostics and Calibration > ILS Calibration > Reference Calibration** option from the Main menu. This is critical to the projector functioning properly. Failure to do so could result in damage to the lens mount, the projector, or the projection lens.

8. Tap **Reference Calibration**.

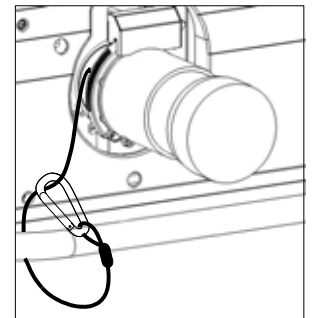


Figure 2-22 Tether Lens to Projector

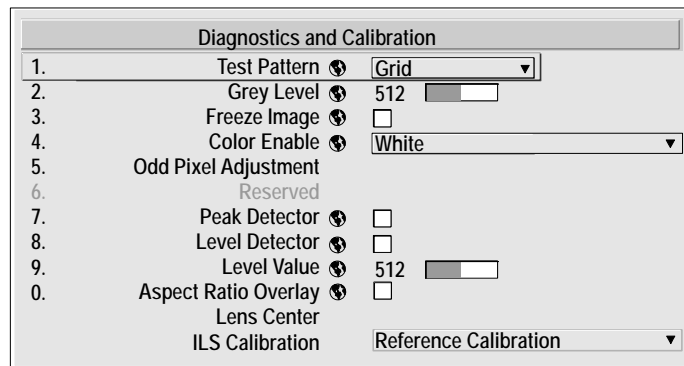


Figure 2-23 Diagnostic and Calibration Menu

## 2.6 Install the Optional Anamorphic Lens

**NOTE:** To use the optional 1.26x anamorphic lens, an anamorphic lens mount is required. The lens mount cover must be removed when installing the anamorphic lens mount and in order to use the MALM.

Install the lens and the mount before leveling the projector or adjusting the image. An anamorphic lens is typically required to display 2.39:1 scope images.

1. Install the anamorphic lens mount hardware following the instructions included with the Christie Anamorphic Lens Mount Kit.
2. Install the 1.26x anamorphic lens mount, following the instructions provided with the anamorphic lens mount kit.

## 2.7 Calibrate the Lens Mount

To calibrate the lens mount, on the **Main** menu select **Lens > Lens Calibration**. Select **All Axes** or adjust each axis individually.

**CAUTION** Lens calibration must be performed each time a new lens is inserted or after performing manual lens mount adjustments. To calibrate the lens, select the **Configuration > Diagnostics and Calibration > ILS Calibration > Reference Calibration** option from the Main menu. This is critical to the projector functioning properly. Failure to do so could result in damage to the lens mount, the projector, or the projection lens.

## 2.8 Install the Lamp

1. Press and hold the **POWER** button to turn the projector off.
2. Allow the lamp to cool for a minimum of 10 minutes.

**WARNING** Never remove the lamp when it is hot. The lamp is under high pressure when hot and may explode, damaging the projector or causing personal injury.

3. Turn the ballast breaker/switch off.
4. Disconnect the projection head and lamp ballast from AC power.
5. Wearing protective clothing and a face shield, unlock and open the lamp door. Release the tethered latch mechanism to remove the door entirely.

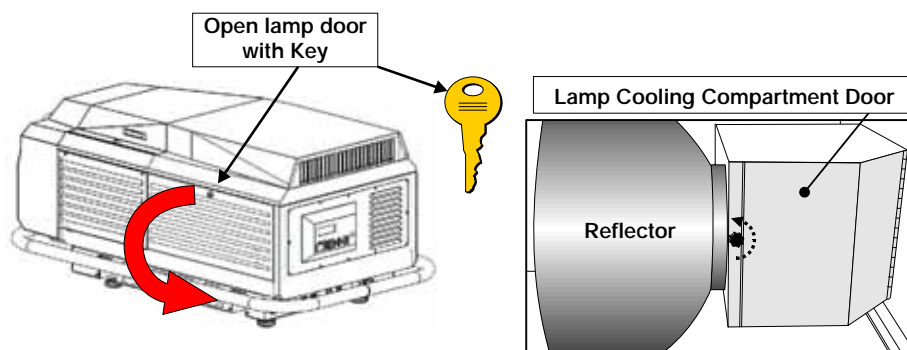


Figure 2-24 Open Lamp Door and Cooling Compartment

6. Remove the new 2.0 kW, 3.0 kW, 4.5 kW, or 6.0 kW CDXL or CXL lamp from its protective cover:
  - a. Remove the tape, knurled nut, and locking star washer (if present) securing the lamp.
  - b. Holding the lamp at the ends and remove the lamp from the cover. Store the protective cover for re-use during your next lamp replacement.
7. Position the anode end of the lamp cradle:
  - a. **For 4.5 kW and 6.0 kW lamps:** Use the holes that are furthest from the reflector.
  - b. **For 2.0 kW and 3.0 kW lamps:** Use the holes closest to the reflector.

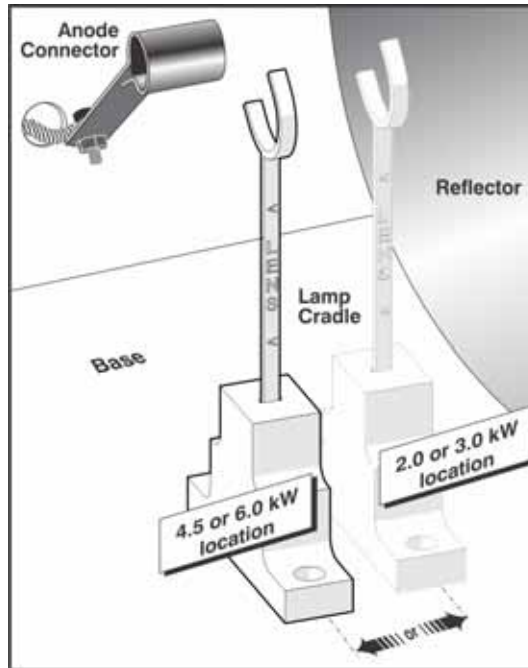


Figure 2-25 Lamp Cradle Position

8. Install the new lamp:
  - a. Wearing protective clothing and a face shield, insert the threaded cathode (-) end of the lamp into the negative lamp connector nut located in the rear of the lamp compartment. Using both hands, hand tighten this end into the threaded nut.

**IMPORTANT!** Handle the lamp by the cathode and anode end shafts only, never the glass. Do not over tighten. Do not stress the glass.

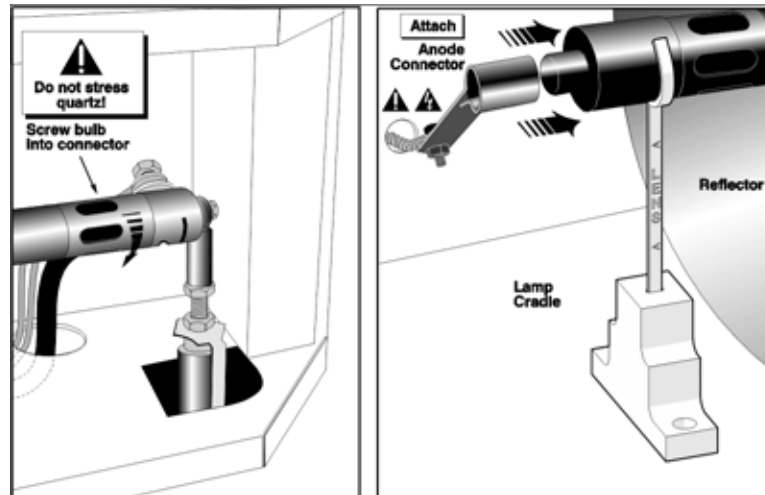


Figure 2-26 Installing the Bulb

- b. Rest the anode (+) end of the lamp on the lamp cradle and slip the positive lamp connector over the bulb end.
- c. Tighten the setscrews in the negative and positive lamp connectors.

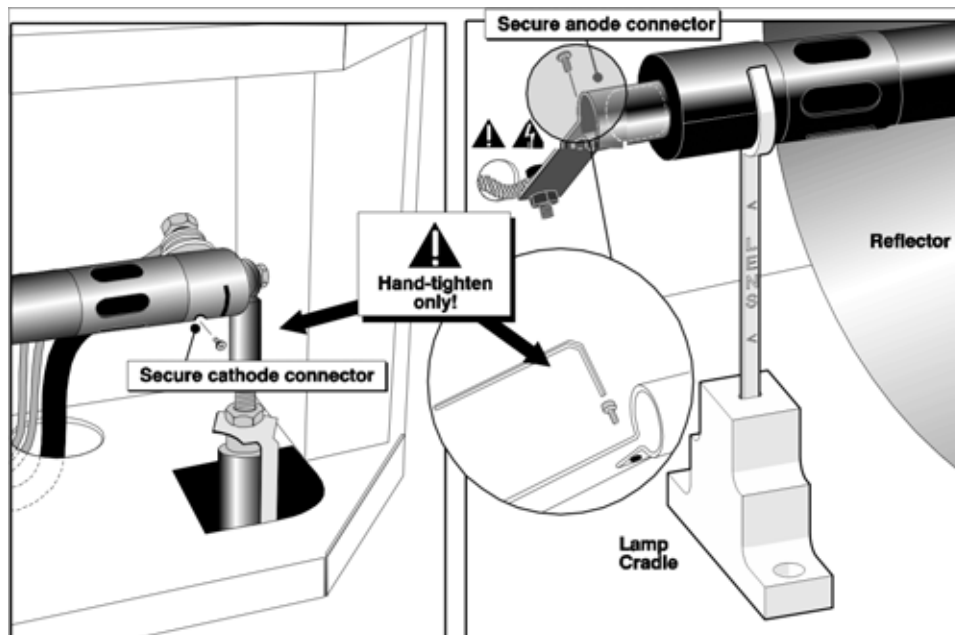


Figure 2-27 Secure Bulb at Cathode (-) and Anode (+) Connectors

**IMPORTANT!** *Proper electrical contact prevents resistance in the lamp connectors. If you accidentally touch the quartz body of the lamp with your bare hands, clean the surface as described in [Section 8.3 Cleaning Optical Components](#).*

9. Make sure that the anode (+) lead between the lamp and the Igniter is well away from any projector metal, such as the reflector or fire wall.

**⚠ WARNING** **Leads too close to metal parts will cause arcing during starting pulse. This is a Safety Hazard, and the lamp may not ignite.**

10. Re-install the cooling compartment door and close and lock the lamp compartment door with the lamp door key.

**NOTE:** *The projector will not operate unless the louvered lamp compartment door is locked shut.*

11. With a blue dot label or dry-erase pen, mark the lamp door's **LAMP INSTALLED** label to indicate the size of the newly installed lamp - 2.0, 3.0, 4.5, or 6.0 kW.

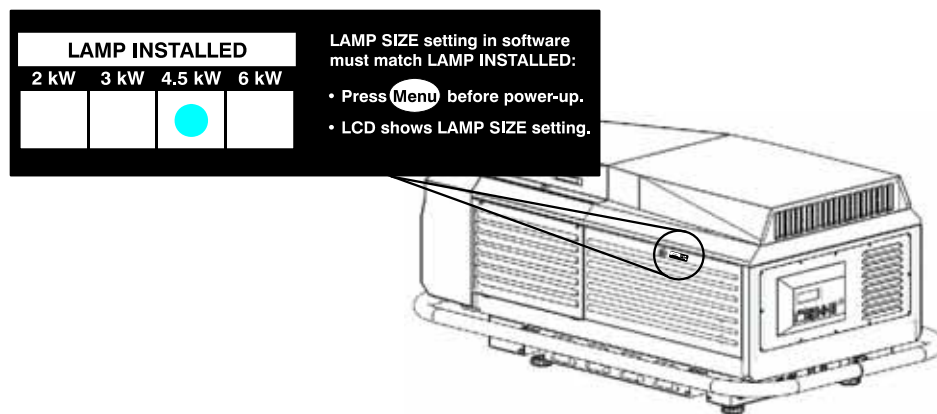


Figure 2-28 Mark the Lamp Installed Label (EXAMPLE)

12. Re-connect the projection head and the lamp ballast to AC power and then turn the breaker/power switch ON. See [Section 2.4 Install the Projector](#).
13. Set the lamp type:
  - a. Press **MENU**.
  - b. Use the keypad or remote to enter the lamp password.
  - c. Use the up and down arrows to select a lamp size.
14. Press **POWER** on the keypad or remote to turn the projector on and ignite the lamp. Wait a minimum of 10 minutes for the projector and lamp to warm up.
15. Open the *Lamp* menu, select *LampLOC™* and then **Do Auto**. See [Section 6.7.10 LampLOC](#).
16. Record the serial number of the lamp:
  - a. In the *Lamp* menu, select **Change Lamp**.
  - b. Enter the serial number in the *Lamp S/N* field.
  - c. Press **ENTER** to record the number and to reset the lamp timer.

## 2.9 Adjusting the Lamp Ballast Input Power

This procedure can only be performed by Christie qualified service technicians.

To accommodate 400 VAC and 200 VAC, the lamp ballast includes an Input Power Range Switch that allows you to match the level of AC available at the installation site. By default, the lamp ballast switch and power cord are set for 200 VAC.

1. Visually inspect the plug to determine if 200 or 400 VAC is required.
2. Remove the ballast cover to access the Input Power Range Switch.
3. Toggle the switch left for 200 VAC, or toggle the switch right for 400 VAC.
4. Attach the ground lug to the Earth Ground terminal.
5. Re-install the ballast cover.

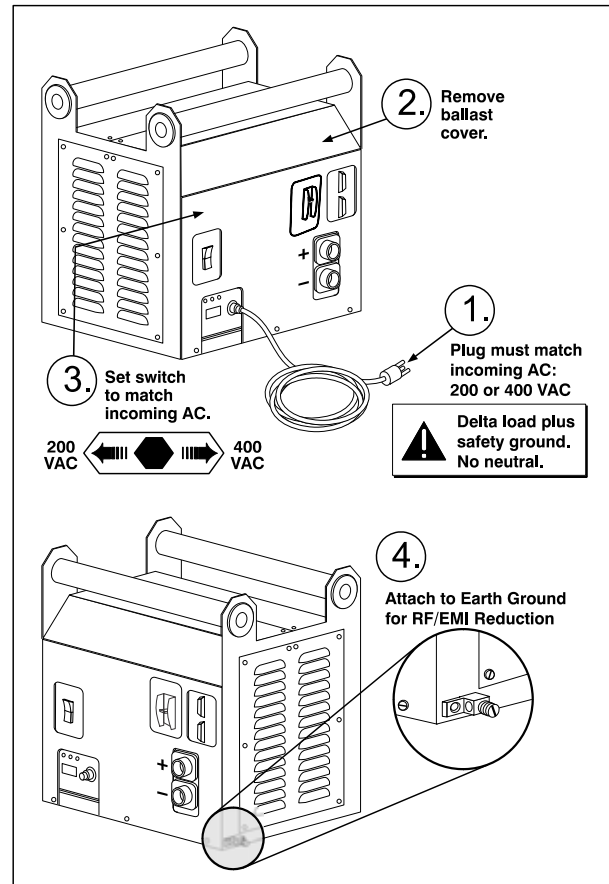


Figure 2-29 Setting up the Ballast

## 3 Connecting Devices to the Projector

This section provides information and procedures for connecting input devices to the projector.

You connect input devices to the input panel located on side of the projector. See [Figure 3-1](#). The input panel includes these input ports:

- **INPUT 1** - This port accepts analog RGB or YPbPr signals.
- **INPUT 2** - This port accepts digital or analog display signals from a computer. Alternatively, you can use an HDMI to DVI adapter to connect a Blu-Ray or DVD player to this port.
- **INPUT 3** - This port accepts analog composite video from devices such as VCRs or DVD players.
- **INPUT 4** - This port accepts S-video from devices such as VCRs or DVD players
- **INPUT 5** - This port accepts serial digital YCbCr (4:2:2) or compatible SMPTE signals.

You can install optional input cards to connect other input devices. You can install or remove the optional input cards when the projector is running.

**NOTE:** *Some input options are not available on some projector models.*

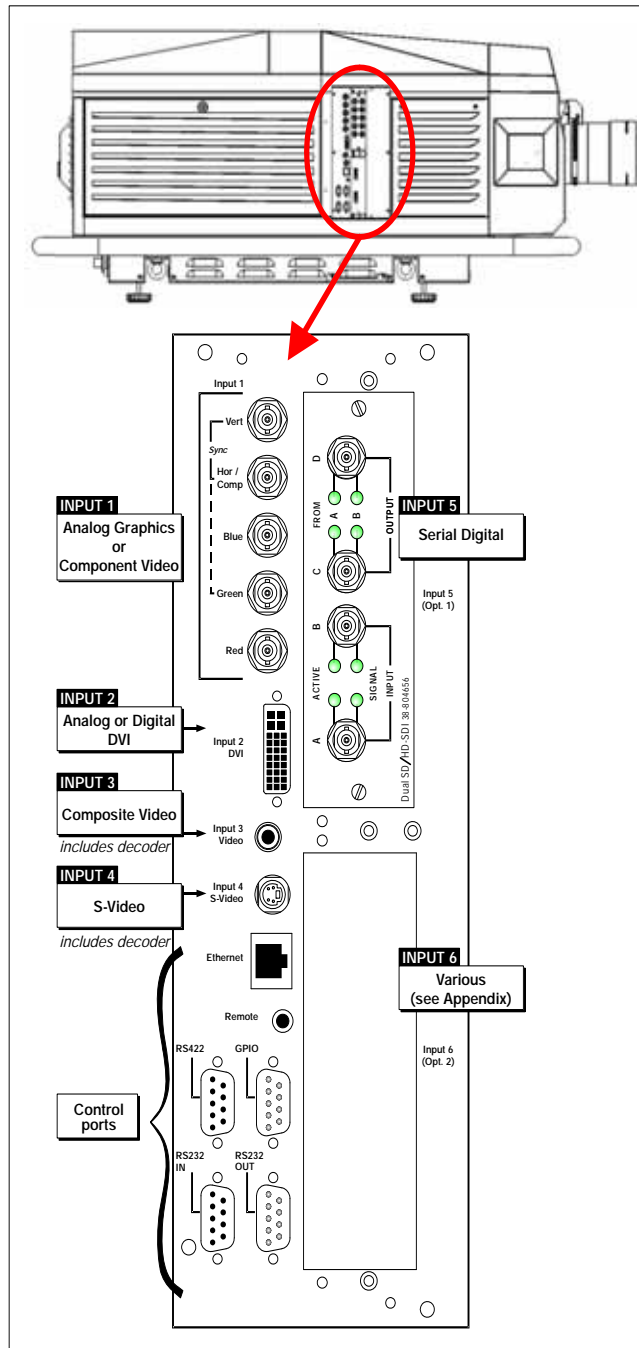


Figure 3-1 Roadie HD+35K Input Panel

**NOTES:** 1) See [Section 6 Projector Menus](#) for details regarding compatible inputs. 2) Use high quality shielded cables for all input connections.



### 3.1 Connecting Component Video Devices

Connect the **SYNC** BNC input(s). Then connect the red, green and blue source outputs to the **RED, GREEN, and BLUE** BNCs on the **INPUT 1** panel. If the input source uses sync-on-green, only the red, green, and blue connections are required. If the input source provides a composite sync output, connect it to the **SYNC** input labeled **HOR/COMP**. If the input source provides separate horizontal and vertical sync outputs, connect horizontal sync to the **SYNC** input labeled **HOR/COMP** and connect vertical sync to **SYNC** input labeled **VERT**. See *Figure 3-2*. Connecting an RGB Source.

Depending on your source, you may need a custom adapter cable with BNC connectors at the projector end and a different type of connector at the other (such as a 15-pin "D" connector for some computer sources). Contact your dealer for details.

- NOTES:** **1)** If for some reason the projector fails to recognize a signal as an RGB signal, specify this Color Space option within the Image Settings menu. See *Section 6.5 Image Settings Menu*. **2)** To connect YPbPr signals-such as from DVDs or analog HDTV sources-to **INPUT 1**, use the red, green and blue BNCs as described in YPbPr Signals (below). **3)** This Input does not route to the decoder and cannot be used for Composite Video or S-Video.

Connect a YPbPr signal (component video) to **INPUT 1** or **INPUT 2** as shown in *Figure 3-3*.

- NOTES:** **1)** If, for some reason, the projector fails to recognize a YPbPr signal, specify this Color Space option within the Image Settings menu. See *Section 6.5 Image Settings Menu*. **2)** Do not connect digital component signals (known as YCbCr) to **INPUT 1** or **INPUT 2**. Use the appropriate optional digital interface installed in **INPUT 5** or **6** only.

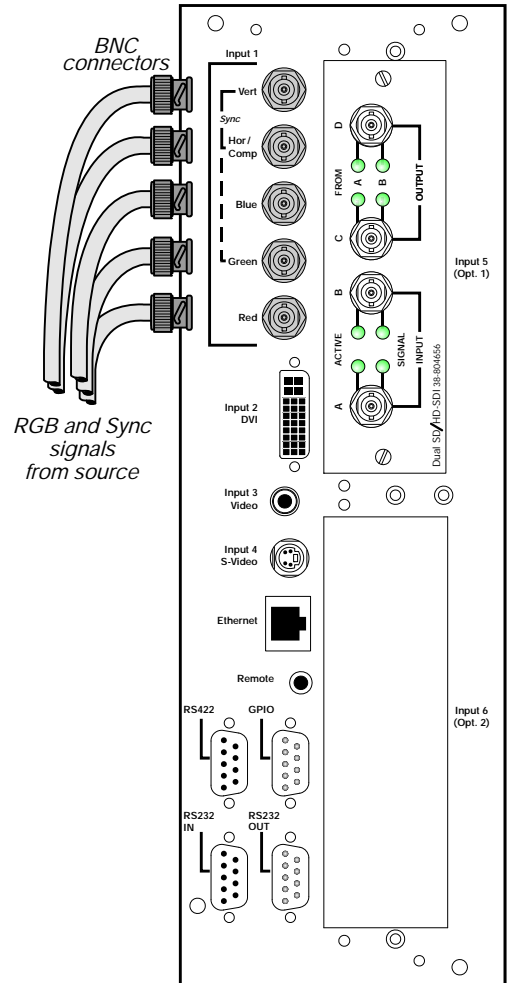


Figure 3-2 Connecting an RGB Source

### 3.2 Connecting Composite Video Devices

**INPUT 3** and **INPUT 4** provide simultaneous connection of both a composite video source (**INPUT 3**) and an S-Video source (**INPUT 4**). See [Figure 3-4](#).

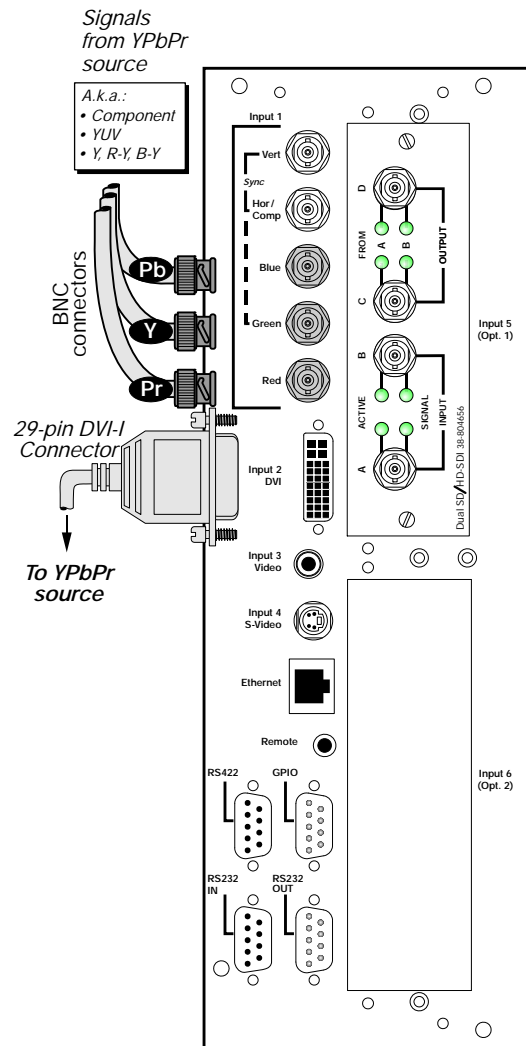


Figure 3-3 Connecting a YPbPr Source

### 3.3 Connecting Standard and High Definition Devices

The Dual SD/HD-SDI module accepts one or two independent standard- or high-definition serial digital inputs, decodes them, and outputs 10-bit RGB/YCbCr 4:2:2 video. Either input can be set as the active primary or secondary part of a Picture-in-Picture (PIP) display, and either input can be looped through to one (or both) of the module's BNC outputs.

**NOTE:** Selection of these inputs is described in [Section 5.1 Turning the Projector On](#).

Connect a compatible SMPTE 292M or SMPTE 259M-C input source to one or both of the inputs located on the left side of the module. The module automatically detects the standard at each input and configure itself accordingly for correct termination of the signal. The module also detects and supports dual link 292M for SMPTE 372M video standards.

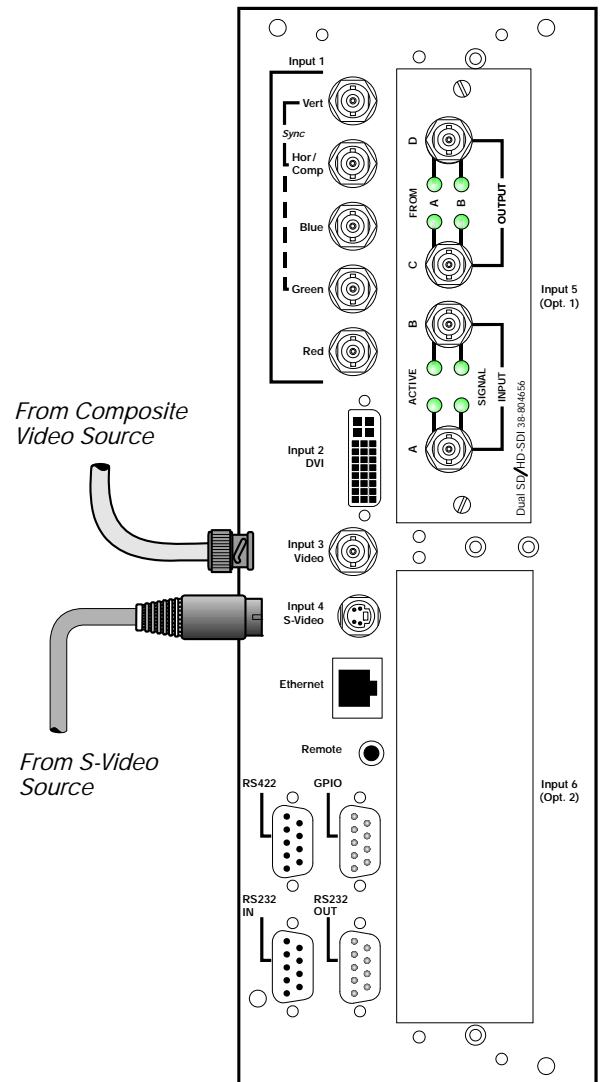


Figure 3-4 Connecting Composite Video

### 3.4 Connecting Extra Video

If you want to use an extra video source in addition to the video source(s) connected at **INPUT 3** or **INPUT 4** connect either a Composite or S-video source to **INPUT 1** as shown.

**NOTES:** **1)** Do not simultaneously connect Composite and S-video to **INPUT 1**. **2)** You can switch between video sources connected at **INPUT 1** and **INPUT 3** or **INPUT 4**.

### 3.5 Installing Optional Input Cards

You can install optional input cards to increase the number of input ports or to accommodate different analog or digital signals. Install the input cards in the **INPUT 6** or **INPUT 5** areas. Available input cards include:

- DVI Input Module
- Dual SD/HD-SDI Module

To connect additional input sources, connect a third-party switcher to the RS-232 port, or one of the two RS-422 ports.

**NOTES:** Connect analog HDTV signals directly to **INPUT 1** or to any other "RGB" Input module installed-the optional HDTV Input Module used in earlier projectors is not needed or recommended.

### 3.6 Connecting the Remote

Connect the remote to the projector with a cable when the infrared sensors are obstructed, or when you are using the remote control at a distance greater than 25 feet. You can connect the remote to the three-pin XLR connector on the rear of the projector, or the 3.5mm phono jack on the side of the projector.

If you are using a wired remote, you must enable the remote in the Communications menu.

See [Section 6.6 Configuration Menu](#).

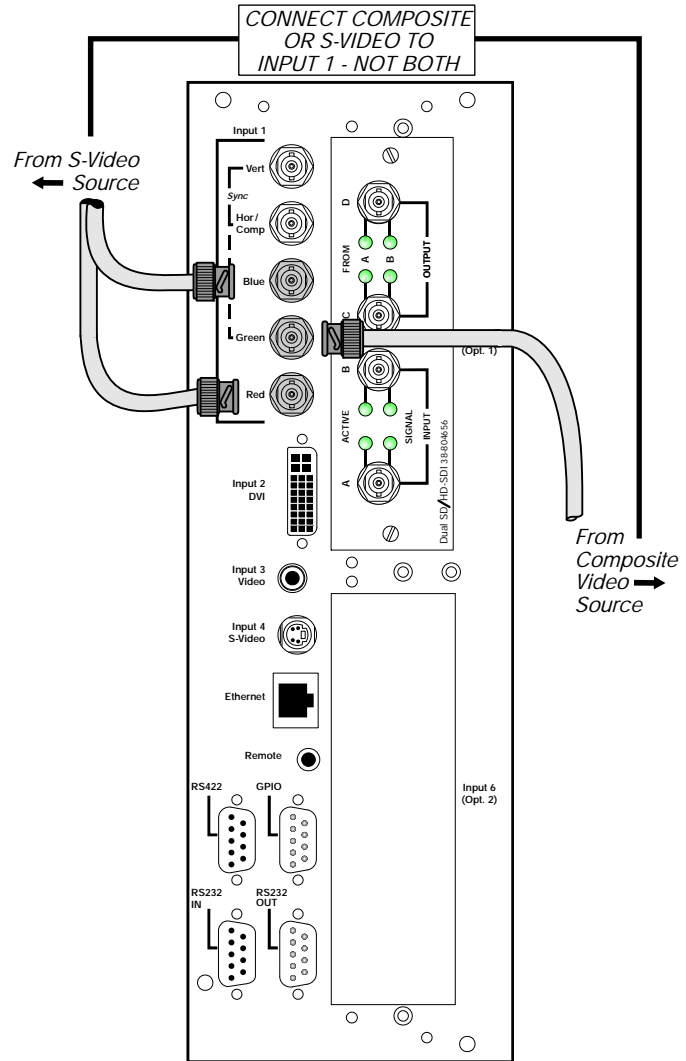


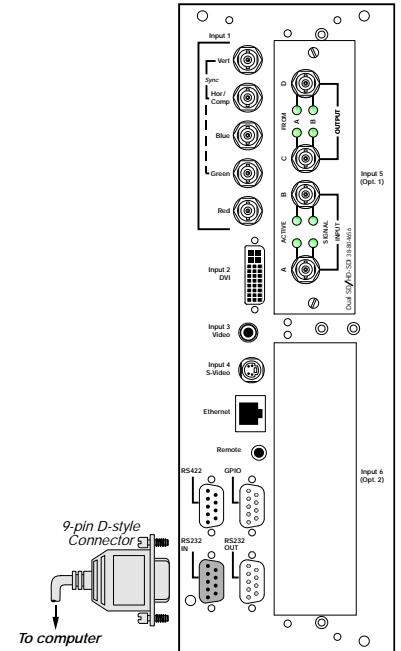
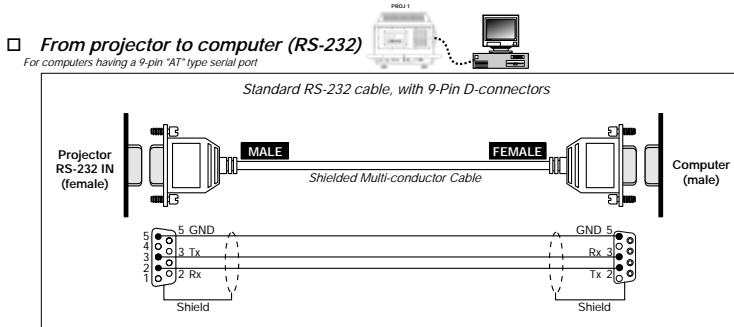
Figure 3-5 Connect Extra Video

### 3.7 Connecting Devices to the RS-232 Port

Connecting a device such as a computer to the RS-232 serial port allows you to control the projector by executing serial commands.

Connect the serial communication cable from the external device to RS-232 IN port. Set the projector baud rate to the baud rate of the input device.

See [Section 6.6 Configuration Menu](#) for information about changing the baud rate of the projector.



### 3.8 Connecting Devices to the RS-422 Port

Connecting a device such as a computer to the RS-422 serial port allows you to control the projector by executing serial commands. There is one 6-pin XLR port on the rear of projector and a 9-pin D-connector on the side of projector.

It is recommended that you use the RS-422 port to connect external devices that are located further than 50 feet from the projector. Connect the serial communication cable from the external device to the RS-422 port on the projector.

Set the projector baud rate to the baud rate of the input device.

**NOTE:** Connecting an RS-232 device to the RS-422 port can damage the projector or input device.

See [Section 6.6 Configuration Menu](#) for information about changing the baud rate of the projector.

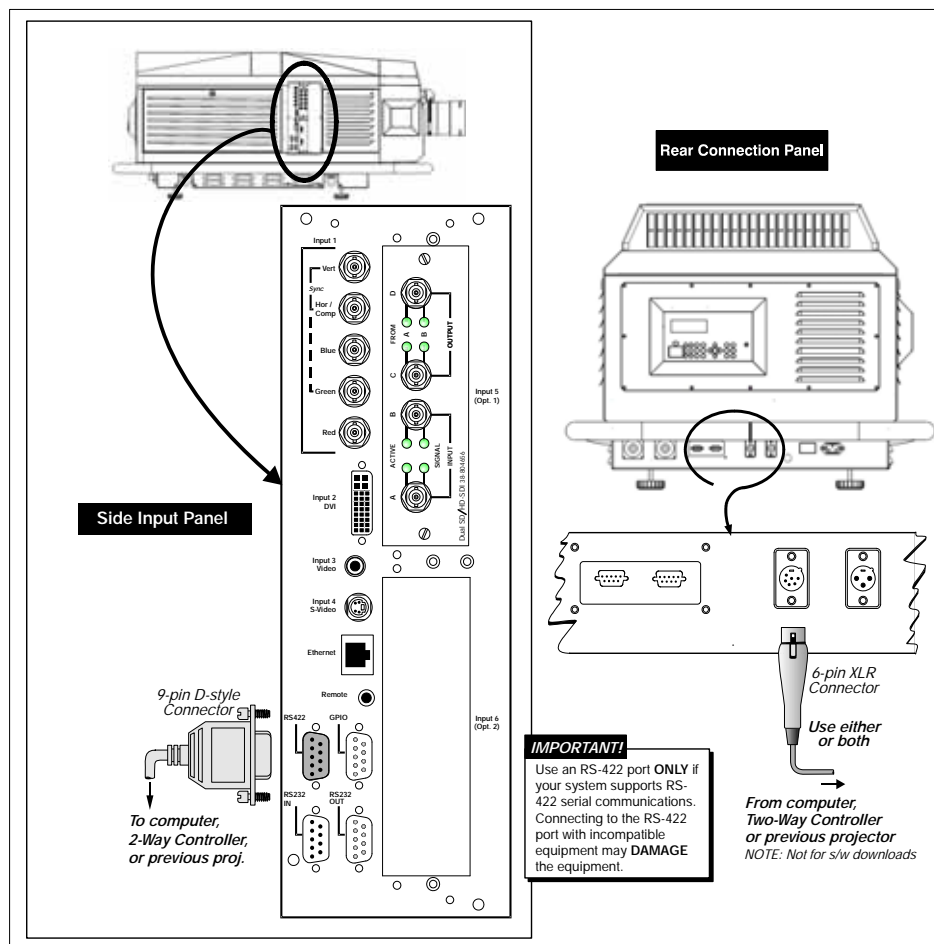
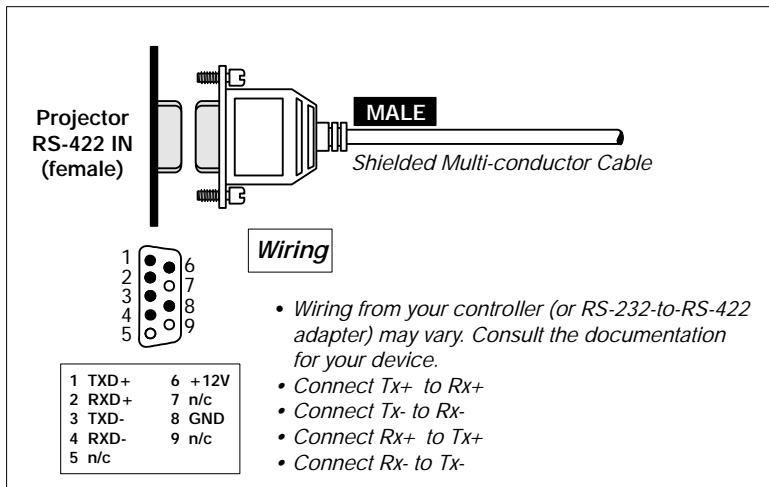


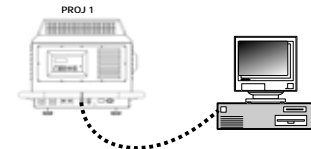
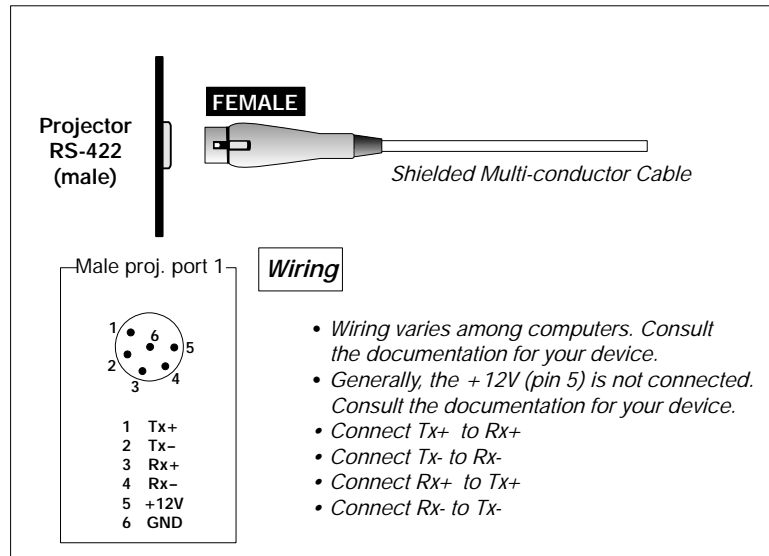
Figure 3-6 Connecting Serial Communications via RS-422

**NOTES:** 1) Use the 9-pin side port to download software upgrades to the projector. 2) When you are using a RS-422 connection, wait until all projectors are initialized before executing serial commands.

□ **From projector (side) to RS-422 compatible computer**



□ **From projector (rear) to RS-422 compatible computer**



**⚠ IMPORTANT ⚠**  
**Not for software downloads.**

### 3.9 Connecting the Projector to the Ethernet

Connect a CAT5 Ethernet cable from the Ethernet hub or switch to the Ethernet port on the side of the projector.

**NOTE:** An Ethernet crossover cable is required when connecting directly to a computer.

When you connect the projector to an Ethernet network, the projector obtains a unique IP address from the DHCP (Dynamic Host Configuration Protocol) server. If a DHCP server is not present you can use **Ethernet Settings** menu or an ASCII serial command to set the IP address.

**NOTE:** Ensure that the projector is connected to the network before attempting to change its IP address.

When the projector is assigned a valid and unique IP address, you must turn the projector off and then on before sending serial commands. To determine the IP address of the projector, use the **Status** and **Ethernet Settings** menus.

On some Ethernet networks, fire wall restrictions may require that the port number of the projector be changed from its default of 3002. To enter a new port number, open the **Ethernet Settings** menu and enter the new number execute an XIP serial command. Do not use port numbers below 1024, because these ports are typically reserved for IP applications.

The Subnet Mask and Default Gateway are automatically assigned when DHCP is enabled. If you are using a static IP, you must assign it before the subnet mask. The Default Gateway is an optional router device used to send and receive data outside the subnet.

See [Section 3.9 Connecting the Projector to the Ethernet](#) for information about Ethernet connections.

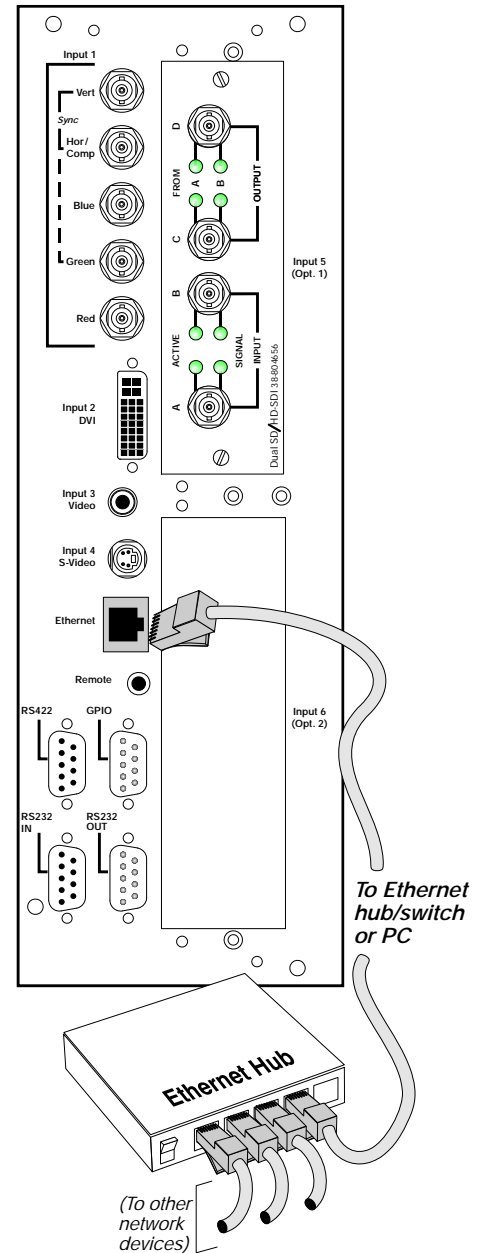


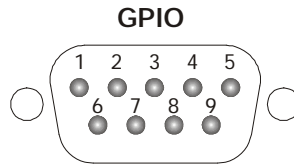
Figure 3-7 Connecting to an Ethernet Network



### 3.10 Connecting Devices to the GPIO Port

You can use the General Purpose In-Out (GPIO) port to connect different input and output devices. You can use the GPIO serial command to automate events such as dimming the lights when an image appears.

There are 7 GIO pins on the 9 pin D-Sub GPIO connector, which you can configure through RS-232 commands. The remaining two pins are reserved for ground and power. This table lists the signal associated with each pin.



GPIO Pins	
Pin #	Signal
1	+ 12V (200MA)
2	GPIO 1
3	GPIO 2
4	GPIO 3
5	GROUND
6	GPIO 4
7	GPIO 5
8	GPIO 6
9	GPIO 7

To configure the GPIO connector, use the KoRE 10-bit Librarian software. Select the **RTE** tab within the KoRE 10-bit Librarian application to view help topics associated with the setup of the GPIO.

You can use the GIO serial command to automate events. Each GPIO connector pin is defined as an input or output. If you configure the pin as an input, the projector responds to the action of an input device. If you configure the pin as an output, the input device responds to projector actions.

You can also use the GIO serial command to set the state of each output pin as high or low. By default, the state of each pin is high. The voltage applied to pins in a high state is +3.3V. A low state (zero) is assumed if the circuit attached to an input pin is open. A high state (one) is assumed if the circuit attached to the input pin is shorted to ground.

This example turns the room lighting on when the projector is turned off. This example assumes a control or automation device is configured to turn the lights on when pin 2 of the GPIO connector is high (09/14).

- (GIO C2 O)                      Set pin #2 configuration to output
- (GIO 2 H)                        Set pin #2 to high (state)

**Query Command**

(GIO?)	Request the state and configuration of all pins
(GIO! "HLLHLH" "OOIOOOI")	Reply of pin state and configuration
(GIO? C2)	Request configuration for pin #2
(GIO! C2 O)	Reply with pin #2 configuration as output
(GIO? 2)	Request the state of pin #2
(GIO! H)	Reply with pin #2 state as high

**Real Time Event**

Use the serial command **RTE** to specify an action that is initiated at a particular time or based on an external stimulus.

PARAMETER	NAME	VALUE
P1	RTE type	G (Real Time I/O Event)
P2	I/O bit	1-7
P3	Pin state (1 Character) (String)	H = High L = Low "LHXXXHLX" Combine multiple inputs and trigger occurs when all conditions are met
P4	Commands	Any valid serial protocol command for the device

This example turns the projector on when a switch on an external device is turned on.

(GIO C2 I)	Set pin #2 configuration as input
(RTE G 2 H "(PWR 1)")	Power on when pin #2 set to high
(RTE G 2 L "(PWR 0)")	Power off when pin #2 set to low

**3.11 Connecting Multiple Projectors with an RS-232 Connection**

RS-232 connections should not exceed 25 feet. Use high quality cables.

1. Set the baud rate of all of the projectors to the baud rate of the external device.
2. Connect the serial communication cable from the external device the RS-232 IN connector of the first projector.
3. Connect a serial communication cable to the RS-232 OUT connector of the first projector and then connect it to the RS-232 IN connector of the second projector.
4. Repeat step 3 to connect additional projectors.

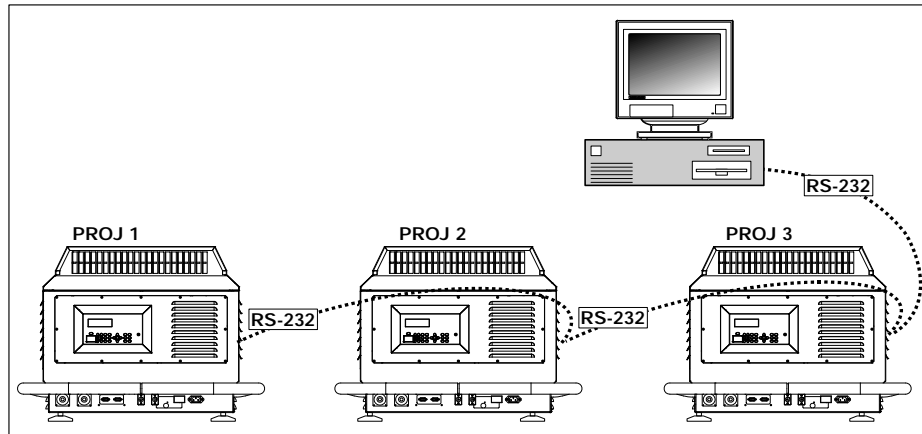
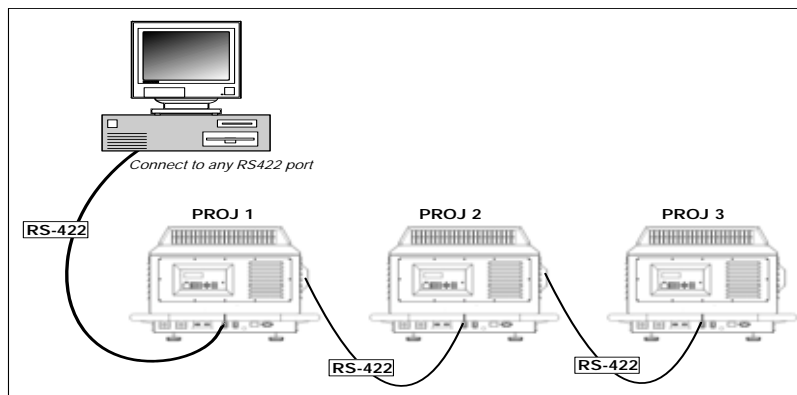


Figure 3-8 Typical RS-232 Network

### 3.12 Connecting Multiple Projectors with an RS-422 Connection

You can link a maximum of 32 projectors.

1. Set the baud rate of all of the projectors to the baud rate of the external device.
2. Connect the serial communication cable from the external device the RS-422 IN connector of the first projector.
3. Connect a serial communication cable to the RS-422 OUT connector of the first projector and then connect it to the RS-422 IN connector of the second projector.
4. Repeat step 3 to connect additional projectors.



### 3.13 Using RS-232 and RS-422 Connections Together

To use RS-232 and RS-422 connections together, open the **Communications** menu and change the **Network Routing** option to **RS232 and RS422 joined**.

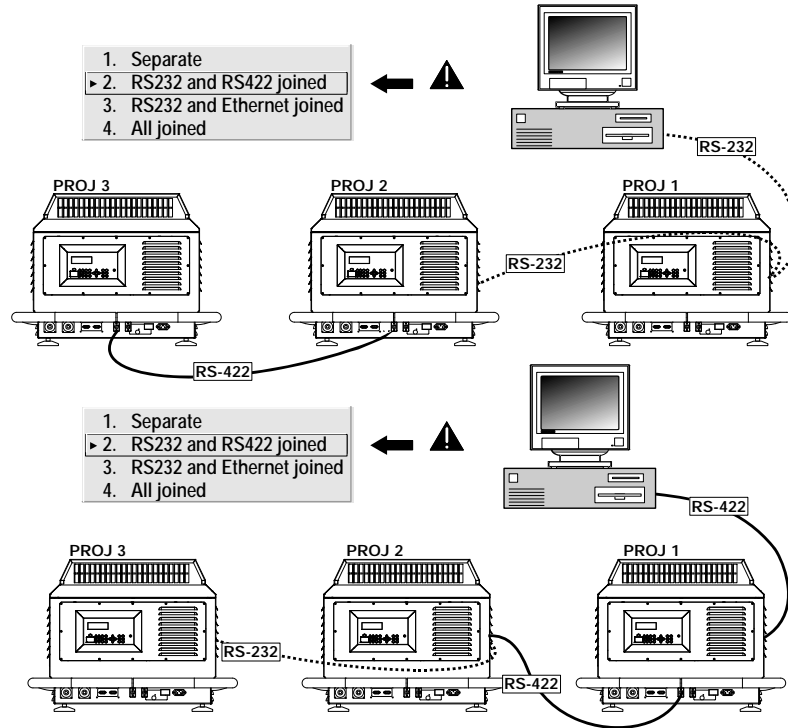


Figure 3-9 Examples of Joined RS-232 and RS-422 Networks

### 3.14 Separating Serial Connections

By default, an external device can only use one type of serial connection to communicate with the projector. For example, if the external device has a RS-422 port, it can only communicate with the projector through a RS-422 connection. This separation of serial connections is called a split network and is identified as **Separate** in the **Network Routing** section of the **Communications** menu.

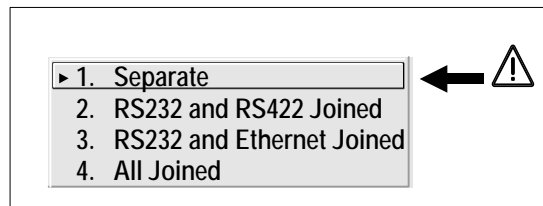


Figure 3-10 Keeping Networks Separate (default)

**NOTES:** Remotes cannot broadcast when networks are separate. Use a controller instead. 4) Do not use a split network when downloading new projector software.

Keeping networks separate maximizes the efficiency of data transmission. Each projector receives and sends either type of message depending on which controller initiates the commands. This configuration allows one connection to act as a back-up if the first connection fails. Only one connection should be active at a time.

**NOTE:** The "Broadcast Key" option must be OFF.

Two different split serial network configurations are available:

- **Split Network with One Controller** - Connect one controller to one physical end of the network and the second controller at the other physical end of the network. If a controller fails, use the second controller to communicate with the projectors. Select **Separate** in the **Network Routing** section of the **Communications** menu.

**NOTE:** This configuration requires that both standards be available from a single controller, or that you use an RS-232/RS-422 adapter.

- **Split Network with Two Controllers** - Connect each controller to the appropriate port on the first projector and then link the projectors together using RS-232 and RS-422 connections. If a controller fails, use the second controller to communicate with the projectors. Select **Separate** in the **Network Routing** section of the **Communications** menu.

**NOTE:** When using a RS-422 connection, use the 6-pin XLR port on the rear of the projector or the 9-pin RS422 IN port on the side Input panel.

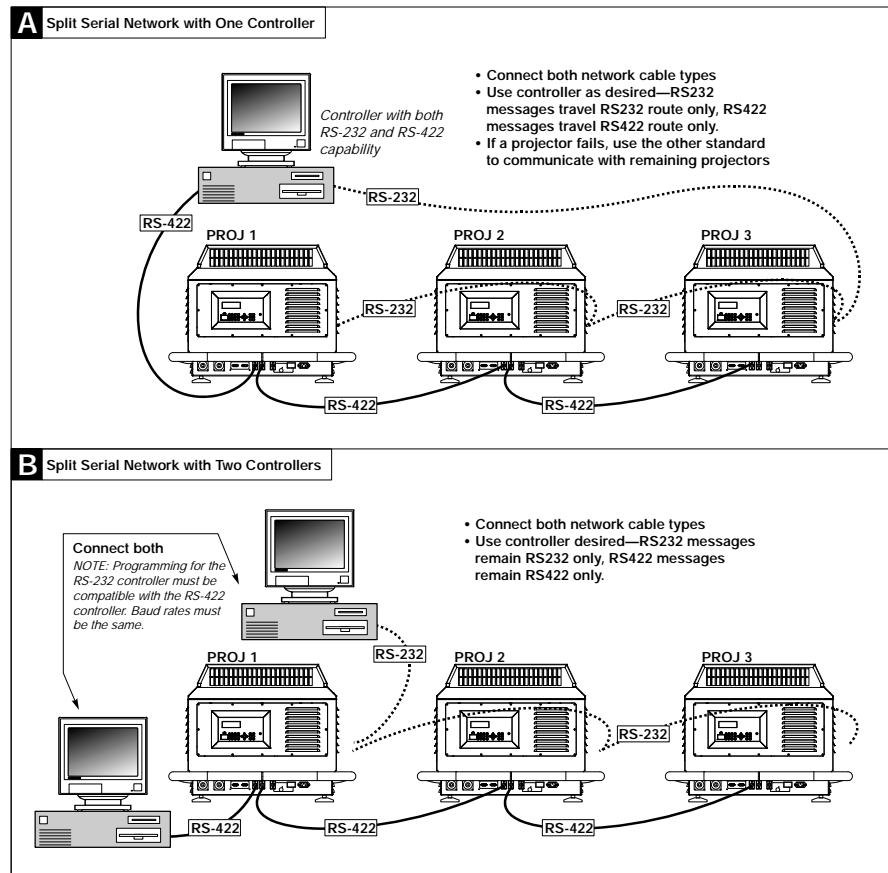


Figure 3-11 Sample Hardware Setups for Split Networks

**IMPORTANT!** When downloading new projector software, use a single-route RS-232 connection. **DISCONNECT** any redundant serial cabling and select **Separate** for Network Routing in each projector.

### 3.15 Connecting Multiple Projectors to an Ethernet Network

1. Connect the external device to a Ethernet hub.
2. Connect the CAT5 cable to the Ethernet port of the projector and then connect the CAT5 cable to the Ethernet hub.
3. Repeat step 2 to connect additional projectors.

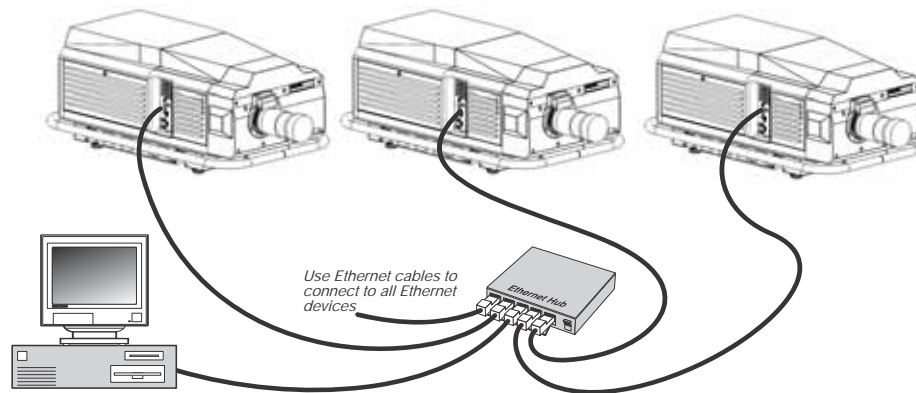


Figure 3-12 Typical Ethernet Network

### 3.16 Changing the Network Routing Option

To relay messages to the RS-232, RS-422, and Ethernet ports, on each projector set the **Network Routing** option in the **Communications** menu to **All Joined**. This configuration is useful if you have one type of controller, but are using a different connection type to link projectors. For example, using an RS-422 controller and an computer connected to the Ethernet to manage a group of projectors that are linked by their RS-232 ports.

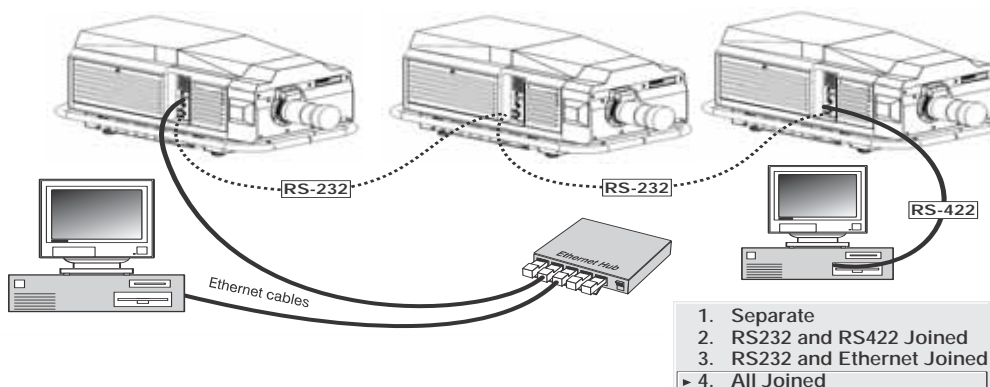


Figure 3-13 Joining All Networks

To isolate your RS-422 communications so that they are not relayed to any other network, set the **Network Routing** option in the **Communications** menu to **RS232 and Ethernet Joined**. Messages from the Ethernet reach the RS-232 network, and vice versa, but RS-422 messages will not.

To isolate your Ethernet from the serial networks, set the **Network Routing** option in the **Communications** menu to **RS232 and Ethernet Joined**. Serial messages are relayed to all serial ports, but Ethernet communications are not.

To keep each network communication links separate from each other, set the **Network Routing** option in the **Communications** menu to **Separate**.

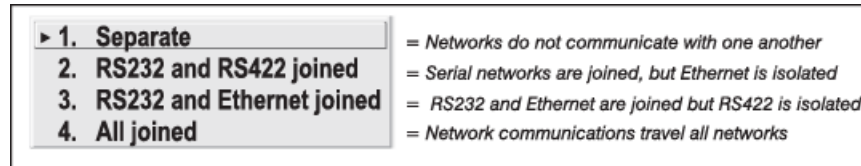


Figure 3-14 Port Communication Menu

### 3.17 Selecting an Input Device

Use one of these methods to select an input device:

- Press an input key for the input device. For example, pressing **INPUT 1 BNC** displays an image from the device that is connected to the **INPUT 1** port
- If **Numbers Select Main Image** is enabled, press the port number (1 to 6) of the input device.

**If it is the first time you have selected the input** or if a channel is not defined for the input, the default settings are used to display the image. Typically, the image appears as large as possible without losing its aspect ratio.

**If a channel exists for the input**, the parameters defined in the channel are used to display the image.

**If two or more channels exist** for the input, the parameters of the channel that most closely matches the input signal is used to display the image.

### 3.18 Adding Input Cards

You can install optional input cards in the *INPUT 5* or *INPUT 6* ports. These are the input cards that you can add to a Roadie HD+35K projector:

- DVI
- Dual SD/HD-SDI (Serial Digital Interface)

### 3.19 DVI Input Card

This input card can display digital video input signals conforming to the DVI (Digital Visual Interface) single channel standard. The DVI input card includes these features:

- Supports Digital Visual Interface (DVI) single-channel
- Supports VESA® Extended Display Identification Data (EDID™)
- Provides an active-loop-through using a DVI connector (conforming to the DVI Specification)

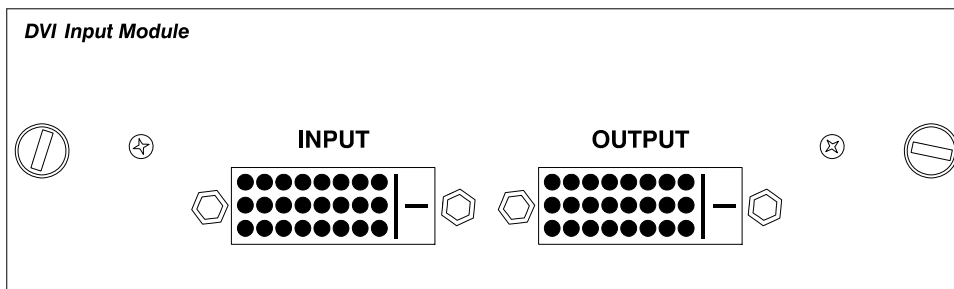


Figure 3-15 DVI Input Module

### 3.20 Dual SD/HD-SDI Input Cards

The dual SD/HD-SDI input card is included with the projector. This card accepts one or two independent standard- or high-definition serial digital inputs, decodes them for processing in the main electronics of the projector, and outputs 10-bit RGB/YCbCr 4:2:2 video. Either input can be set as the active primary or secondary part of a picture-in-picture display, and either input can be looped through to one (or both) of the module's BNC outputs.



# 4 Adjusting the Image

This section provides information and procedures for adjusting the projector image.

## 4.1 Maximizing Light Output

**NOTE:** By default, this projector is optimized for brightness rather than wider color gamut or higher contrast ratio.

To ensure optimal operation and peak screen brightness, use LampLOC™ to adjust the lamp position whenever you install a new lamp in the projector. When you complete the LampLOC™ adjustment, the lamp is centered and is the correct distance from the illumination system. Before running LampLOC, verify that:

- The lamp is installed and the anode lamp cradle is in the correct position
- The lamp is on and the douser is open.
- The lamp has warmed for a minimum of 10 minutes.

1. On the projector keypad, select the **Lamp** menu.
2. Tap **LampLOC**.
3. Tap **Do Auto**.

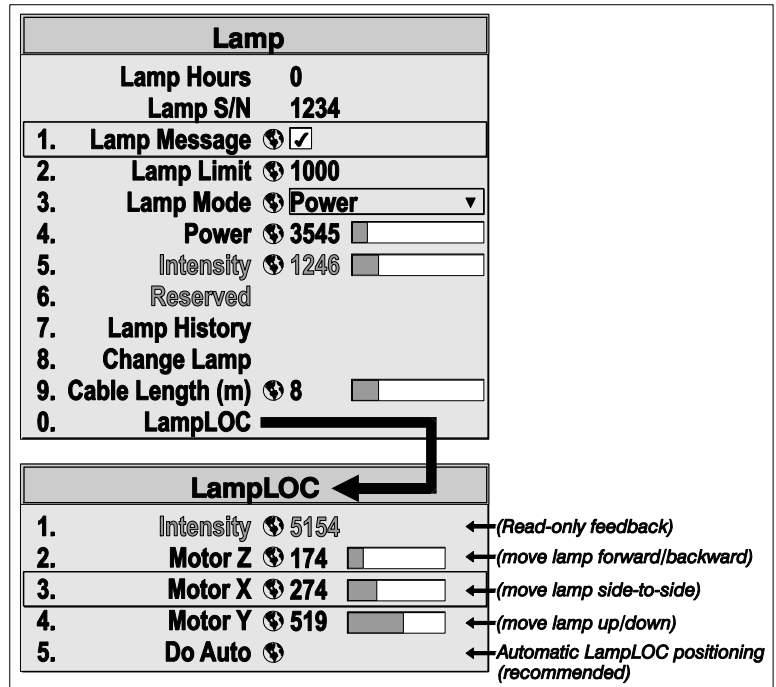


Figure 4-1 Align the Lamp

## 4.2 Aligning the Image

This procedure ensures that the image reflected from the digital micromirror device (DMD) is parallel and centered with the lens and screen. This procedure must be completed before you complete a boresight adjustment.

1. Verify the projector is properly positioned relative to the screen.
2. Display a test pattern that you can use to analyze image focus and geometry. The framing test pattern works well for this.
3. Perform a preliminary focus and (if available) zoom adjustment with the primary lens. See [Section 2.5 Install the Lens](#). Focus the center of the image first.
4. Hold a piece of paper at the lens surface, and adjust offsets until the image on the paper is centered within the lens perimeter.
5. With the test pattern on screen, double-check projector leveling so that the top edge of the image is parallel to the **top edge** of the screen.

### 4.3 Adjust the Offset

This procedure must be completed before you complete a boresight adjustment. See [Section 2.3.4 Vertical and Horizontal Position](#).

### 4.4 Adjust the Horizontal Boresight

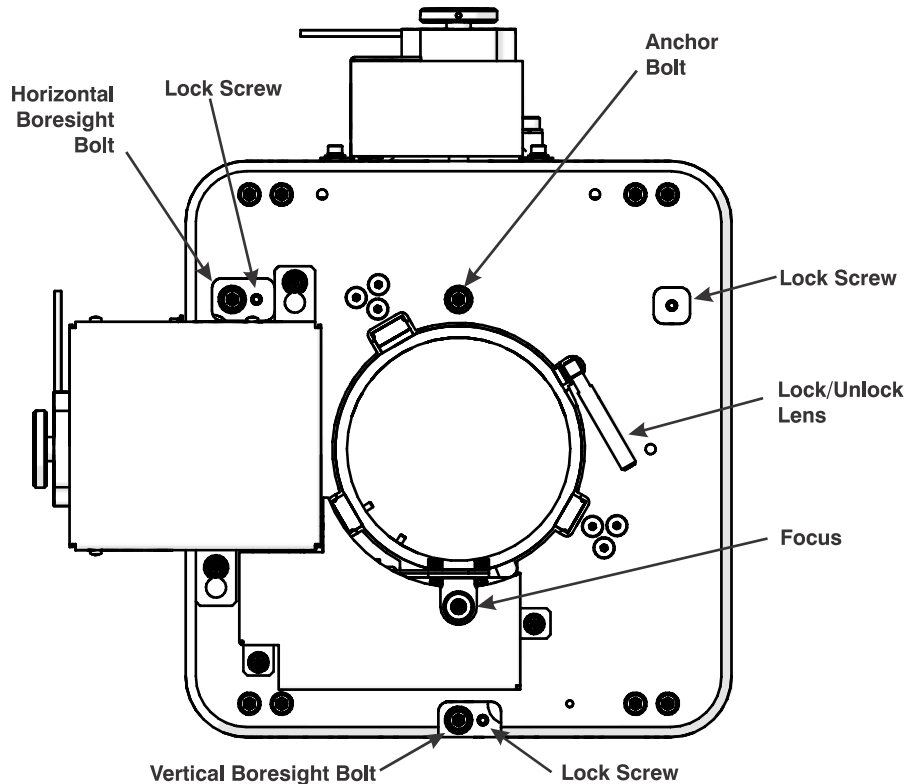


Figure 4-2 Adjust Lens Mount

1. Verify the projector is properly positioned relative to the screen.
2. Project an image with the primary lens. If you have an anamorphic lens installed, swing it out of the way.
3. Adjust focus at the far left center edge of the image. If possible, reduce image size for easier image analysis.
4. If the image appears focused on the left edge, but not on the right, then the boresight currently differs from one side to the other. To determine where the right side is focusing:
  - Hold a piece of white paper approximately parallel to the screen surface at the right side (and as close to the vertical center as possible), then move closer to the projector while watching the image on the paper.
  - If focus on the paper improves, this indicates that the right side of the image is focusing in front of the screen.
  - If focus on the paper worsens, this indicates that the right side of the image is focusing behind the screen.
 If the image is in focus on both sides simultaneously, the left and right boresight is correct. Continue to Step 6.

5. Loosen the horizontal boresight bolt to direct the lens toward the side of the image which is focused too close to the lens. When both sides appear equally blurry, re-focus on the left side of the screen.
6. Adjust horizontal offset to re-center the image on the screen.
7. Repeat Steps 3 and 4 until both sides of the image are well focused.
8. Adjust the lock screw to lock in place, and check boresight again.

## 4.5 Adjust the Vertical Boresight

1. Focus the image at the top edge of the screen.
2. If the bottom is blurry and the top edge is focused. Use a paper at the bottom of the screen to determine whether the bottom of the image is focused in front of the screen or behind the screen. If the bottom is focused, continue to Step 6.
3. Adjust the vertical boresight bolt using one Allen key to hold the bottom hex screw and another to turn the adjustment bolt above it. Adjust to direct the lens toward the edge of the image which is focused too close to the lens. When both top and bottom appear equally blurry, re-focus at the top of the screen.
4. Adjust vertical offset to re-center the image on the screen.
5. Repeat steps 8 and 9 until the top and bottom of screen are both well focused.
6. Although all sides of the image should now be in focus, the center of the image will be slightly blurry at this point. Refocus at center of image. The goal is good focus at center and on all sides.
7. Adjust the lock screw to lock in place, and check boresight again.
8. Adjust the third lock screw.

## 4.6 Adjusting an Anamorphic Lens

1. Swing the anamorphic lens into position in front of the primary lens
2. Optimize the primary projector lens for optical alignment, offset, and boresight.
3. Focus the anamorphic lens. If required, rotate the focus barrel of the anamorphic lens to improve the center-to-edge horizontal focus of the image.

For more information, see [Section 2.6 Install the Optional Anamorphic Lens](#).

## 4.7 Increasing Contrast Ratio

To increase the contrast ratio and reduce brightness, replace the standard F# aperture with an optional smaller aperture. To install the F# aperture, follow the instructions included with the installation kit.

**NOTE:** *Some lamps are incompatible with the F# aperture. Use the aperture recommended for the lamp installed in the projector.*

## 4.8 Adjusting Color Gamut

Install the optional yellow notch filter **to achieve the widest color gamut**. Do not add the yellow notch filter if maximum brightness is preferred over increased color gamut.

## 4.9 Maximizing Brightness

Install a standard high-brightness lens.

## 4.10 DMD Convergence

A convergence problem occurs when one or more projected colors (red, green, blue) appears misaligned when examined with a convergence test pattern. Normally the three colors should overlap precisely to form pure white lines throughout the image and one or more poorly converged individual colors may appear adjacent to some or all of the lines. Contact your Christie accredited service technician to correct DMD convergence issues.

## 4.11 Fold Mirror Adjustment

If a corner or edge of an image is missing, the fold mirror might be misaligned with the optical system. To correct this issue:

1. Locate the fold mirror access plate secured to the underside of the projection head, just below the lens.
2. Insert a 3 mm hex driver in one of the access holes to adjust the fold mirror screws.
  - Turn the adjustment screw on the base of the projector that is closest to the operator's side (right side, when facing screen) to raise or lower the image.
  - Turn the adjustment screw on the left side of the projector to move the image left or right.

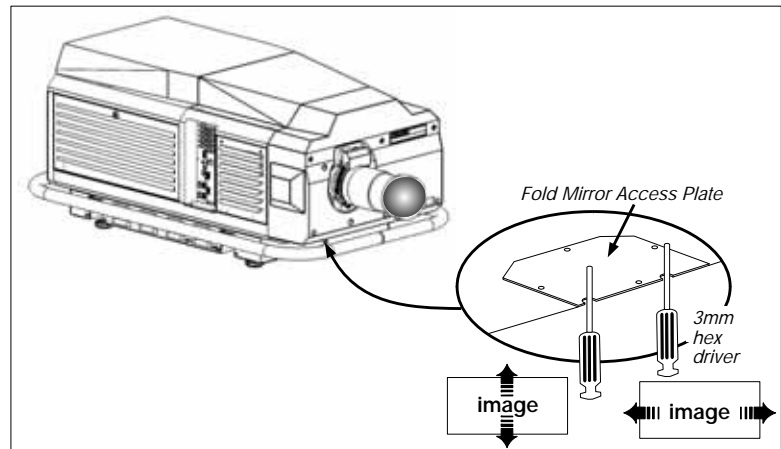


Figure 4-3 Fold Mirror Adjustment

Proper fold mirror adjustment with the whole image centered between the projected edges of the integrator.

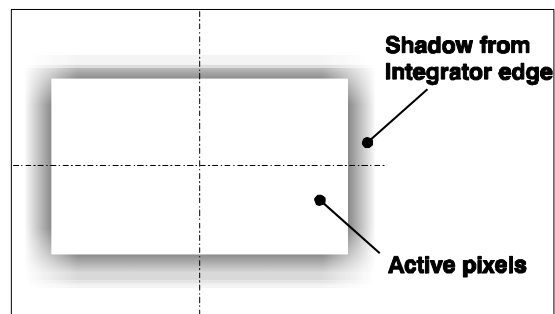


Figure 4-4 Proper Fold Mirror Adjustment

## 4.12 Setting Up Multiple Projectors

Use these procedures to optimize the images displayed by multiple projectors.

### 4.12.1 Adjusting the Primary Color Settings

Use a color meter to measure the red, green, blue, and white native primary colors as they appear on the screen. On each projector, open the **Service** menu and enter these measurements as the Color Primary Settings. After you enter the settings, the projector automatically matches the color settings to the viewing environment.

To reset the primary color settings to their default values, open the **Service** menu and select **Reset to Factory Defaults**.

### 4.12.2 Adjusting Display Colors

- Optimize the color settings on all of the projectors in the array. Do not adjust the color temperature.
- Align the screen edges of all projectors in the array.
- Assign a number to each of the projectors in the array.
- Open the **Color Adjustments by X,Y** menu and assign the same lamp mode to all projectors:
  - Select **Max Drives** in the **Select Color Adjustment** field.
  - Display a full white test pattern.
  - Adjust the lamp power settings until the white fields have the same brightness.
- On the primary projector in the array, open the **Color Adjustments by X,Y** menu and record the settings for the x and y coordinates.

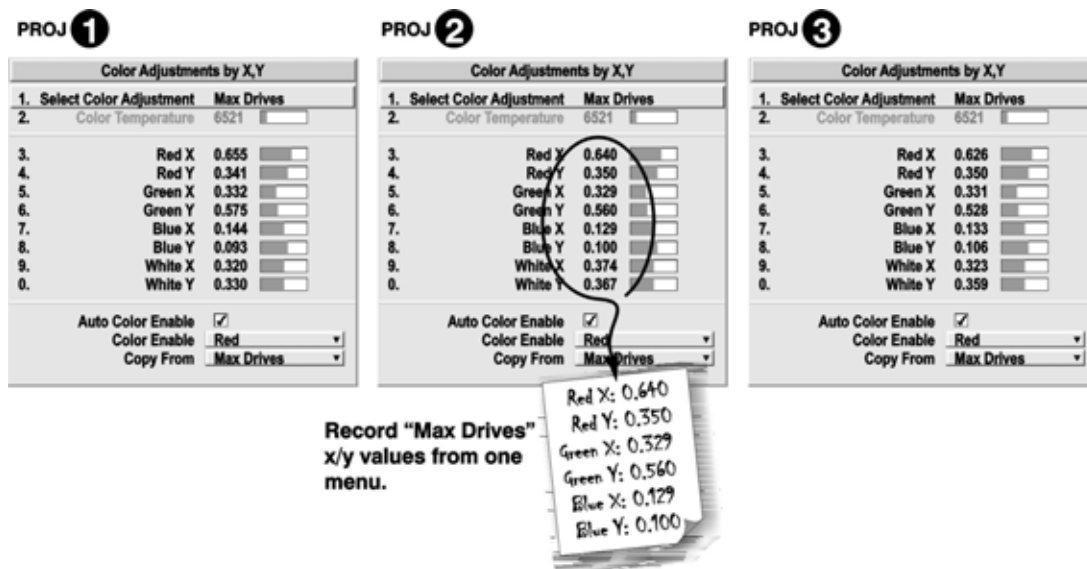


Figure 4-5 A Set of Max Drives X/Y Values

- On each projector in the array, select a user in the **Select Color Adjustment** list.
- Enter the *X* and *Y* values from the primary projector into the *X* and *Y* fields.

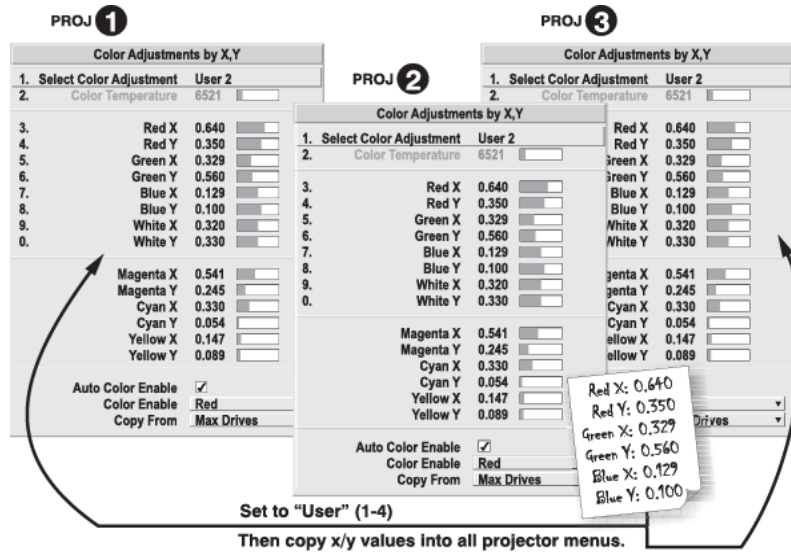
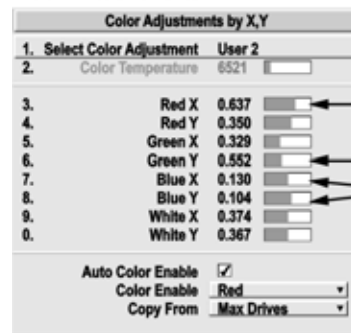


Figure 4-6 Copy X/Y Values into All Projectors

8. On each projector, complete these adjustments:
  - Decrease the Red X value until the full field red screens of all projectors match.
  - Decrease the Green Y value until the full field green screens of all projectors match.
  - Increase the Blue X value until the full field blue screens of all projectors match.
  - Increase the Blue Y value until the full field blue screens of all projectors match.

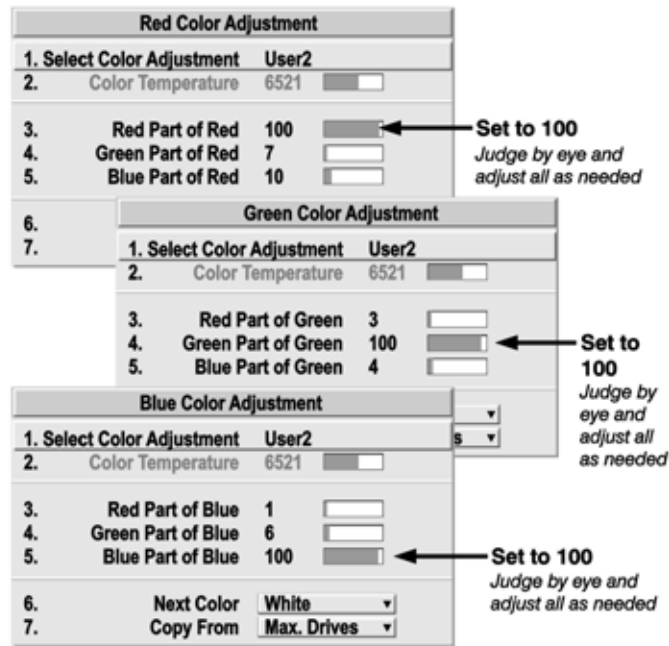
**IN ALL PROJECTORS:**



**NOTE:** To adjust colors quickly, select Auto Color Enable. When you adjust a color coordinate, a full field display of the corresponding color appears.

### 4.12.3 Color Matching with the Color Saturation Menu

1. Adjust the display color values.
2. Open the **Color Saturation** menu.



3. Set these values to 100:
  - Red Part of Red
  - Green Part of Green
  - Blue Part of Blue

### 4.12.4 Adjusting Brightness Uniformity

You use the Brightness Uniformity setting to ensure that:

- No area of the screen appears more red, green, or blue than another.
- No area of the screen appears brighter than another color and light output from one screen closely matches adjacent screens.
- Color and light output from one screen closely matches adjacent screens.

Before working with brightness uniformity it is recommended that you complete these tasks:

- **Adjust colors** - Adjust the primary colors to ensures that the primary colors, color temperature, and maximized light output is well matched from one screen to another.
- **Run lamp for 100 hours** - Light output and **Brightness Uniformity** can vary significantly during the first 100 hours of lamp use. For best results with new lamps, adjust the brightness uniformity after this period, or complete an initial setup and verify the settings after 100 hours.
- **Set lamp power** - Make sure each **Lamp Power** setting is as high as possible for your application while still maintaining a good overall match of light output from screen-to-screen.
- **Use a "User" color temperature** - Always adjust **Brightness Uniformity** for a User color temperature defined when you matched primary colors, and continue to use it for all sources.

To adjust uniform brightness:

1. Adjust the primary color settings to ensure the color temperature and light output is similar on all screens. See [Section 4.12.1 Adjusting the Primary Color Settings](#).
2. On the **Main** menu, select **Configuration > Geometry and Color > Brightness Uniformity**.
3. Select **Uniformity Enable**.
4. Select a 13 point test pattern in the **Test Pattern** list.
5. Select **Color Adjustment by X, Y** and then select a color.
6. Select **User 1** in the **Select Color Adjustment** list if you have created a User 1 color gamut.

OR

Select **Max Drives** in the **Select Color Adjustment** list for maximum brightness.

7. Select **White Uniformity** and move the **Overall** slider to **50.0**. Leave the other sliders at zero.
8. On each screen, compare the color temperatures in the 8 target zones (4 edges and 4 corners) to that of the color temperature of the center. Compare using a white field only, and take note of any areas that do not match the center.
9. Select a uniformity adjustment option (Left, Right, Top or Bottom) to adjust the color temperature of the edge that exhibits a different color temperature from the center. For example, if the left side is too blue, too red, or too green, select **Left Uniformity** and adjust the colors until all portions of the left side closely match the center color temperature.

Match to color temperature of center zone

• Adjust **SIDE** first, then **CORNERS**  
• Focus on extreme **EDGES**

Left Uniformity		
1.	<b>Left Side, R</b>	5.6 <input type="text"/>
2.	G	15.6 <input type="text"/>
3.	B	35.2 <input type="text"/>
4.	<b>Top Left Corner, R</b>	19.5 <input type="text"/>
5.	G	35.1 <input type="text"/>
6.	B	70.5 <input type="text"/>
7.	<b>Bottom Left Corner, R</b>	71.3 <input type="text"/>
8.	G	79.1 <input type="text"/>
9.	B	68.1 <input type="text"/>
<b>Color Enable</b>		White <input type="text"/>
Adjust light output of entire left side. Look at center of side.		

Examine test pattern.

Adjust color(s) in each zone as required, matching to center zone.

**Recommended:**  
• 0~40 for edges  
• 0~80 for corners

Figure 4-7 Match Zones to Center Color Temperature

10. Repeat step 9 for all edges that exhibit a different color temperature from the center.
11. On each screen, compare the color temperatures in the 8 target zones (4 edges and 4 corners) to that of the color temperature of the center. Compare using a white field only. If the target zones do not match the center, repeat steps 9 and 10.



12. On each screen, compare the light output of each edge and corner to that of the center. If any of the areas are different:
  - Select **White Uniformity**.
  - Adjust the **White Uniformity** of the edges. The edge values should be lower than the center value.
  - Adjust the **White Uniformity** of the corners.

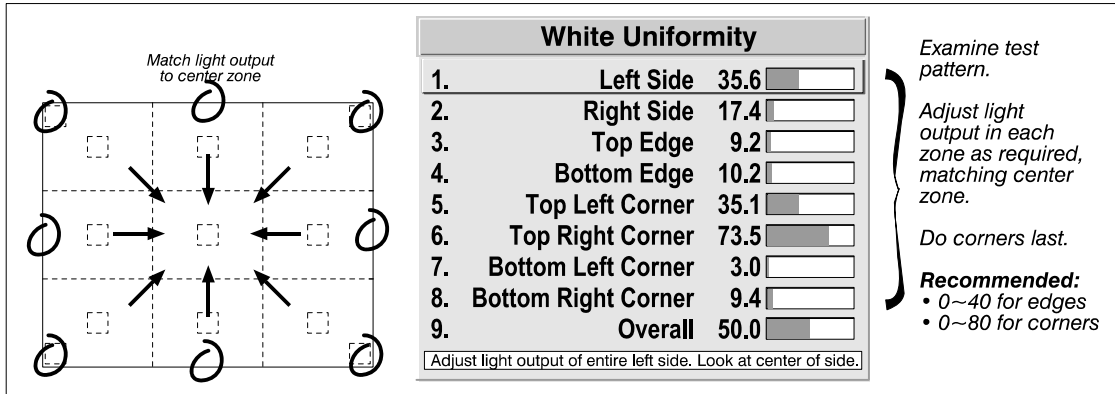


Figure 4-8 Match Zones to Center Light Output

13. Re-adjust the color temperature values in the 8 target zones (4 edges and 4 corners). Repeat step 9 if required.

### 4.12.5 Edge Blending

A blend appears as a gradient strip along an edge of a projected image. It is darkest along the extreme edge of the image, and lightens near the center of the image.

In multiple-projector walls, complementary blends between neighboring images can compensate for the extra brightness or intensity where these edges overlap. By controlling blend width and other properties, you can achieve uniformity across a group of images.

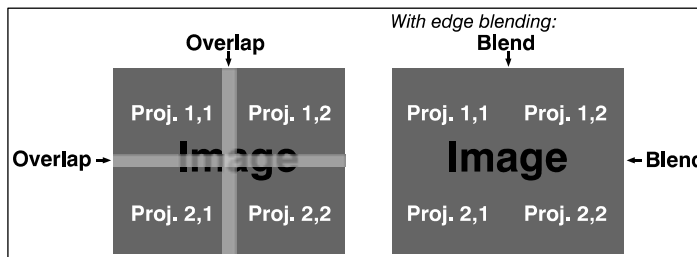
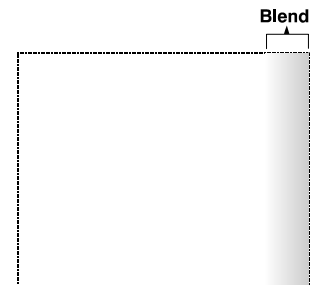


Figure 4-9 Edge Blending Multiple Images

For the best image, use the same projector model and type in multiple-projector walls. In addition, avoid using high-gain screens whenever possible.

1. Verify your source hardware or software can support a tiled image for the number of projectors in use, and that the tiling includes overlapping data of approximately 12.5-25% along the shared edges.
2. Physically align the projectors and images from your intended external source, and then match colors and brightness uniformity.

**IMPORTANT!** For a shared edge, the blend settings should be identical on both projectors.

3. Overlap 2 full-screen projector images by 12.5-25%.
4. On the **Main** menu, select **Configuration > Geometry and Color > Edge Blending**.
5. Select **Blending Enable**.
6. Select a full white field test pattern in the **Test pattern** list.
7. Set all blend widths to zero.
8. Select **More** and set all values to **50**.

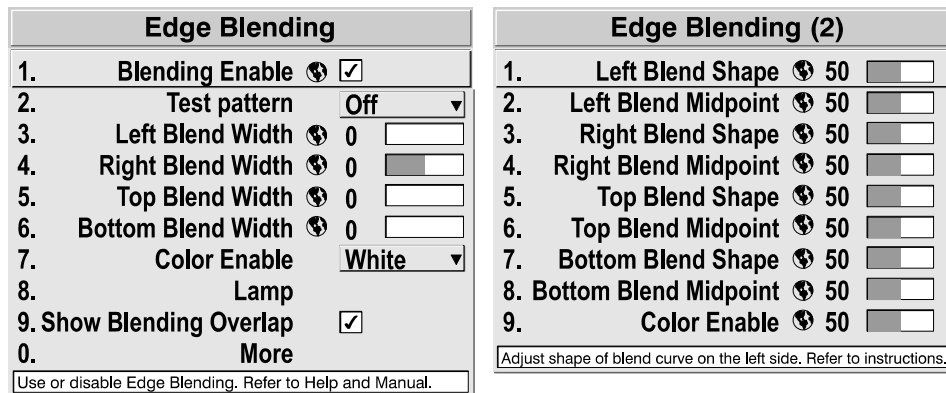


Figure 4-10 Edge Blending Starting Values

9. On one projector, increase the blend width of the shared overlapping edge. Apply the same setting to the second projector.
10. Adjust the blend width on both projectors until the bright band at the midpoint of the overlap disappears or changes to light gray. Apply the same **Blend Width** setting on each projector. If the best blend is between two settings, choose the wider setting
11. If the blended region appears too dark or light in relation to the rest of the image:
  - Increase or decrease the **Blend MidPoint** in both projectors to lighten or darken the overall blend.
  - Adjust the **Blend Shape** on both projectors to change the amount of mid-gray intensity in the blend.
12. Repeat steps 3 to 11 on the remaining projector.
13. Adjust mechanical alignment to maintain perfect pixel-on-pixel alignment over time.

# 5 Operation

This section describes how to operate the Roadie HD+35K projector.

## 5.1 Turning the Projector On

**⚠ WARNING** Do not turn the projector on if the AC supply is not within the specified voltage range.

This procedure assumes the lens and lamp are installed, and the lamp ballast and the projector are connected to AC power. See [Section 2.4 Install the Projector](#).

1. Turn the lamp ballast on/off breaker switch on.
2. Press **MENU** on the projector keypad or the remote.
3. Select a lamp.
4. Press and hold **POWER** to turn the projector on and ignite the lamp. The PROJ. STATUS light on the rear of the projector illuminates green.
5. Open the **Lamp** menu and set the **Cable Length (m)** setting to the length of the high-voltage DC cables that run from the lamp ballast to the projection head. This setting ensures that adequate voltage reaches the lamp.

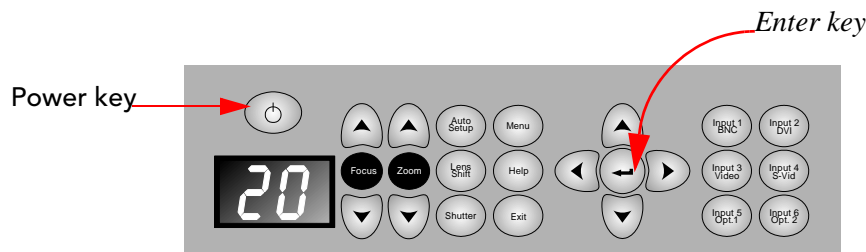
## 5.2 Turning the Projector Off

1. Press **POWER + DOWN**.
2. Allow the projector to cool for a minimum of 10 minutes.
3. Turn the lamp ballast on/off breaker switch off.

## 5.3 Projector Keypad Key Descriptions

Use the projector keypad on the rear of the projector to control the projector when signals from the **remote** cannot reach the projector.

- Press one key at a time; there are no simultaneous key combinations available.
- If you press a key while the projector is still responding to a previous action, the second key press may not take effect.



**Figure 5-1 Projector Keypad**

### Power Key

Press **POWER + UP** to turn the projector ON and ignite the lamp.

Press **POWER + DOWN** to turn the projector OFF and extinguish the lamp.

After you turn off the projector, it is recommended that you wait a minimum of three minutes before turning it on. Hot re-strikes of the lamp can reduce lamp life.

### Auto Setup Key

Press **AUTO SETUP** to automatically optimize display parameters, such as the size and position of the image.

**NOTE:** *You cannot use **AUTO SETUP** on a locked channel.*

**Table 5.1 Auto Setup**

OPTIMIZES:	SETS TO DEFAULT:
Pixel Tracking	Contrast
Pixel Phase	Brightness
Size and Blanking	Auto Input Level (off)
Vertical Stretch	Detail (if video source)
Position	Filter
Input Levels	Luma Delay

### Help Key

Press **HELP** to display help about the current menu. If a specific help topic is unavailable, a list of general Help topics appear. To exit help, press **HELP** or **EXIT**.

### Input 1 BNC Key

Press **INPUT 1 BNC** to display an image from the device that is connected to the **INPUT 1** port. If picture-in-picture (PIP) is enabled, press **INPUT 1 BNC** to assign it as the PIP source.

### Input 2 DVI Key

Press **INPUT 2 DVI** to display an image from the device that is connected to the **INPUT 2** port. If picture-in-picture (PIP) is enabled, press **INPUT 2** to assign it as the PIP source.

### Input 3 Video Key

Press **INPUT 3 VID** to display an image from the device that is connected to the **INPUT 3** port. If picture-in-picture (PIP) is enabled, press **INPUT 3** to assign it as the PIP source.

### Input 4 S-Vid Key

Press **INPUT 4 S-VID** to display an image from the device that is connected to the **INPUT 4** port. If picture-in-picture (PIP) is enabled, press **INPUT 4** to assign it as the PIP source.

### Input 5 Opt 1 Key

Press **INPUT 5 OPT 1** to display an image from the **INPUT 5** interface module. This is typically a Dual SD/HD-SDI Module. If picture-in-picture (PIP) is enabled, press **INPUT 5** to assign it as the PIP source. If there are two inputs connected to this module, the second input is **INPUT 7**.

To access **INPUT 7**, press **INPUT 5 OPT 1**.

**Input 6 Opt 2 Key**

Press **INPUT 6 OPT 2** to display an image from the **INPUT 6** interface module. If picture-in-picture (PIP) is enabled, press **INPUT 6** to assign it as the PIP source. If the Dual SD/HD-SDI module is installed and there are two inputs connected, the second input is **INPUT 8**. To access **INPUT 8**, press **INPUT 6 OPT 2**.

**Menu Key**

Press **MENU** to enter or exit the projector *menu*.

**Shutter Key**

Press and release **SHUTTER** and then press the **UP** key to close the mechanical shutter. Closing the shutter turns the display off and reduces lamp power to 60% of the maximum rating for 4.5 and 6.0 kW lamps or 75% for 2.0 and 3.0 kW lamps.

Press and release **SHUTTER + DOWN** to open the mechanical shutter. Opening the shutter restores lamp power to its previous setting, and restores the image.

**Enter Key**

Press the **ENTER** key to select a highlighted menu or option item, to toggle a check box, or to accept a parameter adjustment, and return to the previous menu or image.

**Exit Key**

Press **EXIT** to return to the previous menu.

**Arrow Keys**

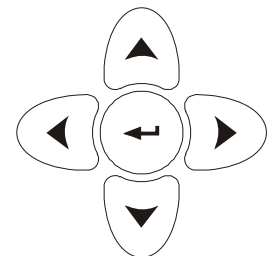
Use the **RIGHT** and **LEFT** keys to change a slide bar value or check box, or to select a different option within a list.

Use the **UP** and **DOWN** keys to move up or down within a menu, list, or text box.

**Focus and Zoom Keys**

Press **FOCUS + UP** or **DOWN** to focus the image.

Press **ZOOM + UP** or **DOWN** to increase or decrease the image size.



**5.4 Identifying the Lamp Wattage**

To avoid igniting the lamp with the wrong wattage, it is recommended that you check your lamp wattage before you turn the projector on.

If the projector is turned on, use the **Status** menu to determine the lamp size. If this information does not match the installed lamp, change the **Lamp Size** setting in the **Service** menu, or turn the projector off and use this procedure.

1. Press **MENU**.
2. Use the keypad or remote to enter the lamp password. The lamp size of 2000, 3000, 4500 or 6000 watts appears on the LCD screen. The default is 6000 watts. If you think the wattage is incorrect, contact your Christie accredited service technician.

## 5.5 Controlling the Projector from a Remote Location

You can use one of these options to control the projector from a remote location:

- **Via ASCII Messaging** - Use a serial cable to connect your controller to the RS-232 or RS-422 port of the projector. Alternatively, you can use an Ethernet connection to communicate with the projector. See Christie Serial Communications on the Christie web site for more information about ASCII codes and messages.
- **Via Web Interface** - Connect a computer to the Ethernet port on the projector. Open your web browser and enter the IP address of the projector in the web address field. Press **Enter**. A login screen appears. Enter a login id and a password. The default login id is **ccm7**.

You can control multiple projectors from a single computer. Each projector is managed with a separate ChristieNET interface. Each projector can have four separate web connections.

If proxy server settings are interfering with the remote connection, disable the proxy server settings. You must have Java version 1.4.2 or higher installed to run ChristieNET. On some projectors, some ChristieNET options

## 5.6 Error Messages

ERROR MESSAGE TYPE	DESCRIPTION
Invalid User Entry	A entry not recognized by the projector triggers an on-screen error message identifying the problem. For example, if you specify a channel number that is not available, the message Invalid Channel will appear. Or if you enter an incorrect password, the message Invalid Password appears. Press <b>ENTER</b> or <b>EXIT</b> to clear the message.  You cannot disable invalid user entry error messages.
Input Signal Errors	An input signal error message appears during a presentation when you select an input on which the projector detects a problem. Menus remain operational. However, you must resolve the signal problem to permanently remove the message. Press any key to temporarily remove the error message.
Signal Error Messages	The No signal message appears when a source signal cannot be detected, HSYNC and VSYNC are inactive, and the screen background is black. Connect or correct the signal, or try another input.  The Bad Sync message appears when HSYNC or VSYNC are active, but the signal cannot be displayed. Such a condition occurs when only one of the two sync signals is present, or when either sync signal is unstable or of the wrong frequency. Correct the signal or select another input.  Signal error messages can appear indicating that HSYNC or VSYNC are too fast or too slow. Open the <b>Status</b> menu and verify the frequencies. If they are correct, then the projector does not recognize the signal. If the frequencies are incorrect, check the cabling to see where the problem might originate.  On some computers you may be able to change the settings to generate a compatible signal.
System Warnings	A system warning appears when a system malfunction occurs. The projector remains operational, but the message indicates a potentially serious problem that should be reported to Christie. Press <b>EXIT</b> twice to remove the message, or press <b>POWER</b> to restart the projector.
System Errors	A system error message appears when a serious malfunction has been detected and must be reported to Christie. You cannot operate the projector unless you restart it.

## 5.7 Status LED Codes

This table lists the status codes that display on the rear of the projector. When an error code appears, a system error has occurred and you should contact a qualified service technician. To clear the message, press **EXIT** twice during a presentation, or restart the projector.

CODE		DESCRIPTION
<b>GENERAL</b>		
12		Software error. Contact dealer/factory.
13		CRC error in flash ROM. Download new software.
14		Engineering-only programming is complete. Call Christie, replace TIPM.
15		Attempting to download s/w code without being in boot mode
16		Invalid interrupt. Power off/on. If persists, contact dealer/factory.
17		User has forced system to stay in boot mode
18		Attempting to program boot mode without jumper
<b>LAMP / BALLAST</b>		
20		The lamp is unexpectedly on (likely a ballast and/or wiring problem)
22		One or more high-current lamp cables is not connected
26		Lamp door is open (interlock)
27		Lamp cannot ignite
28		Lamp has turned off unexpectedly
29		Lamp ballast is overheated
2C		Lamp communications fault; ballast is not detected
<b>SENSORS for COOLING</b>		
40		Lamp has shut down due to fan failure
46		The red TEC (DMD) has overheated
48		The blue TEC (DMD) has overheated
49		The prism has overheated
4C		Projector has shut down due to critical error
4D		Integrator has overheated
4E		Inadequate lamp air intake rate (interlock)
4F		Inadequate air exhaust rate (interlock)
<b>FANS (NOTE: there are no Fans 1 or 2 in this projector)</b>		
53		Fan 3 has failed (side [rear] intake fan)
54		Fan 4 has failed (side [front] intake fan)
55		Fan 5 has failed (lamp exhaust fan)
56		Fan 6 has failed (LAD fan)
57		Fan 7 has failed (card cage fan)
58		Fan 8 has failed (heat exchanger fan — for liquid cooling system)

CODE	DESCRIPTION
<b>10-bit IMAGE PROCESSOR (TIPM)</b>	
60	Boot code CRC failed
61	Unable to program the DigMux PLD
62	Unable to program the Control PLD
63	Unable to program the Bubks PLD
64	Unrecognized ROM type
65	Write to flash ROM failed
66	General TIPM failure
67	Downloaded code will not fit into ROMs
68	Communication error with scaler on TIPM
<b>BUILT-IN KEYPAD or ID EEPROM</b>	
70	Unable to access the projector keypad EEPROM
71	EEPROM on the projector keypad has re-initialized
<b>IRAM (a.k.a. Panel Driver) or IRAM/TIPM Communications, or EFIB or Modular Formatters</b>	
80	Unrecognized IRAM (a.k.a. Panel Driver)
81	Unable to program a device on the IRAM
82	TI flash download fault — critical error
83	TI flash download fault — partial success
84	TI flash download fault — partial success
85	TI I <sup>2</sup> C fault (write failure)
87	Consecutive RDRAM faults from modular Formatters
90	Red modular Formatter link failure
91	Green modular Formatter link failure
92	Blue modular Formatter link failure
93	Modular Formatter Architecture error
94	Modular Formatter / DMD mismatch
95	Modular Formatter sequence mismatch
96	EFIB not responding to I <sup>2</sup> C messages
<b>BACKPLANE OR OPTIONAL MODULES</b>	
A0	Unable to program the optional interface module
A1	Unable to power the optional interface module
A2	Unable to program the Backplane
A3	Unable to program the Warp Module option ( <i>Christie TWIST</i> )



# 6 Projector Menus

This section provides information and procedures for using projector menus. You can use projector menus to adjust projector settings and view status information.


## 6.1 Main Menu


Use the **Main** menu to access size and position, image channel, configuration, lamp, status, picture-in-picture (PIP), and test pattern settings.

- Press **MENU** to display the **Main** menu.
- Press **EXIT** to return to the previous screen.
- Press **MENU** to exit the projector menus.

To select an option on a menu, use the **UP** and **DOWN** keys to select an option and then press **ENTER**.

Locked menu items or items that do not pertain to the current action or condition appear grayed out, and cannot be selected.

The **Global**  icon appears next to menu options that apply universally to all incoming signals.

The **picture-in-picture (PIP)**  icon appears next to menu options that apply only to the picture-in-picture (PIP) image.

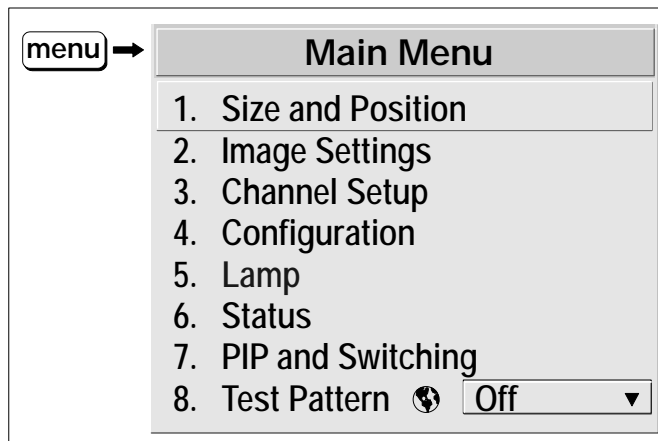


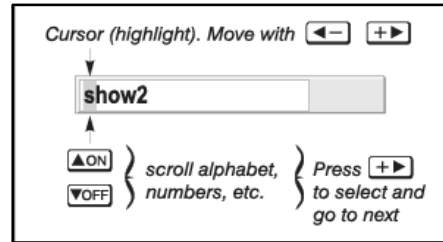
Figure 6-1 The Main Menu

## 6.2 Viewing Help

Press **HELP** to display help about the current menu. If a specific help topic is unavailable, a list of general Help topics appear. To exit help, press **HELP** or **EXIT**.

## 6.3 Editing Text and Numbers

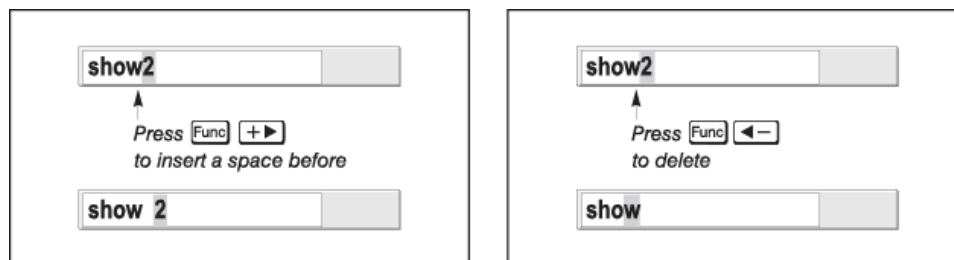
To enter or edit text, highlight the text and press **ENTER**. The **Edit** dialog appears. Press the **RIGHT** key to move the cursor forward or press the **LEFT** key to move the cursor backward.



**Figure 6-2 Entering Text**

To edit a character, press **UP** or **DOWN** to scroll through the available letters, numbers, spaces, and punctuation marks. You can use the projector keypad or remote to enter a number. Press the **RIGHT** key to select a character. After you select a character, the cursor moves to the next character.

If you are using the remote, press **FUNC + RIGHT** to insert a space and **FUNC + LEFT** to delete a character or space.



**Figure 6-3 Editing Text**

To save your edits and close the **Edit** dialog, press **ENTER**.

Press **EXIT** to cancel your changes and redisplay the previously defined text.

## 6.4 Size and Position Menu

To open the **Size and Position** menu, press **Menu** and select **Size and Position**. You can use the **Size and Position** menu to increase or decrease the size of your image, change its aspect ratio, move the image to a specific area of the screen, and define other parameters.

Size and Position			
1.	Resize Presets	No Resizing	▼
2.	Size	0.729	<input type="text"/>
3.	Vertical Stretch	1.000	<input type="text"/>
4.	Pixel Track	858	<input type="text"/>
5.	Pixel Phase	0	<input type="text"/>
6.	H-Position	360	<input type="text"/>
7.	V-Position	262	<input type="text"/>
8.	Reserved		
9.	Reserved		
0.	Advanced Size and Position		

Figure 6-4 Size and Position Menu

Changes made in the **Size and Position** menu apply immediately and are saved when you press **EXIT** or **MENU**.

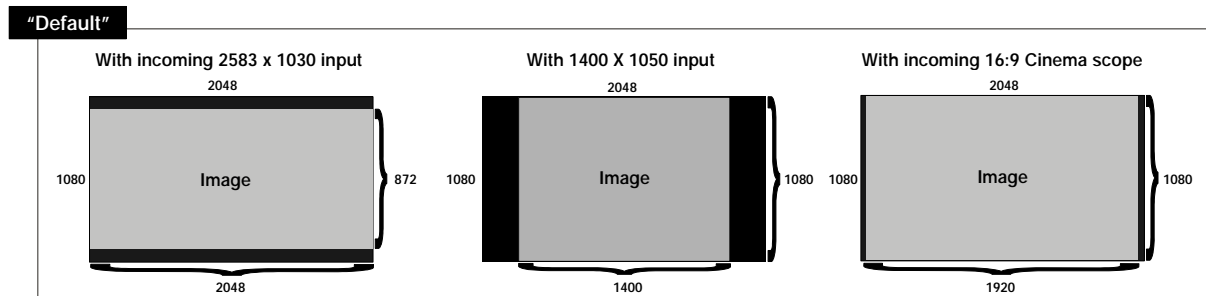
Resize Presets	
1. Default	= maximize for current source
2. No Resizing	= display in native resolution
3. Full Size	= fill the screen (regardless of source)
4. Full Width	= fill display width & keep aspect ratio
5. Full Height	= fill display height & keep aspect ratio
6. Anamorphic	= retain 16:9 aspect ratio
<i>Custom (not selectable) = non-preset values for Size, Vertical Stretch, H-Position, V-Position and/or Blanking</i>	

Figure 6-5 Resize Presets List

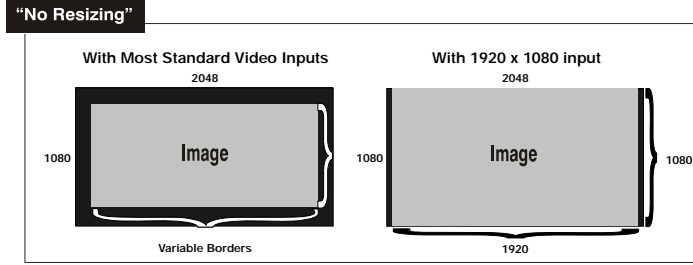
### 6.4.1 Resize Presets

The **Resize Presets** list includes these options:

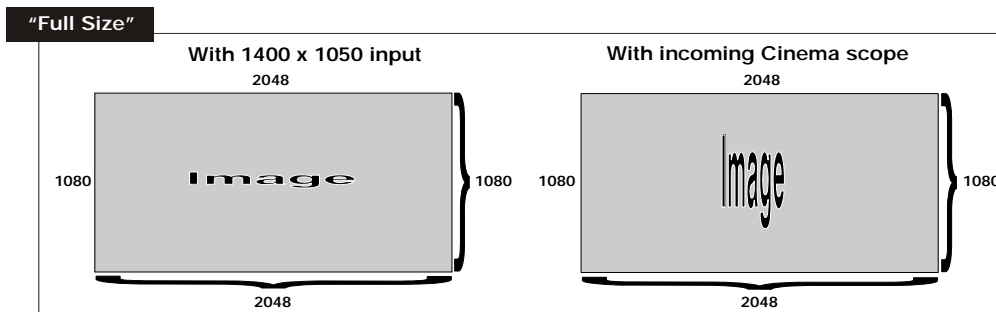
- **Default** - centers and enlarges the image without affecting the aspect ratio. A 16:9 image fills the height of the screen with black bars on both sides.



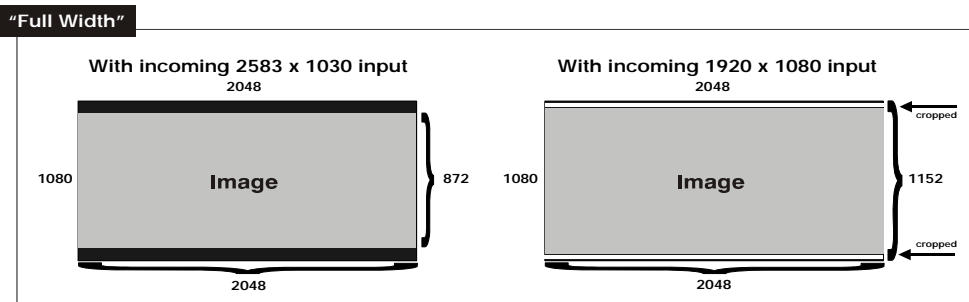
- **No Resizing** - displays the image in its native resolution. For example, for a source with a native resolution of 800 x 600, selecting **No Resizing** centers the image within a black border.



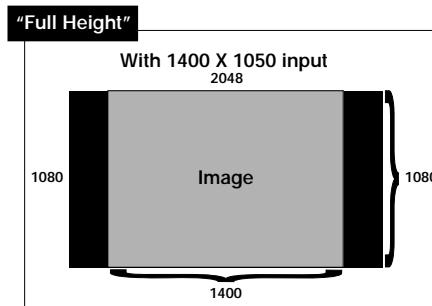
- **Full Size** - uses all pixels (2048 x 1080) to display the image and ignores the aspect ratio of the input source.



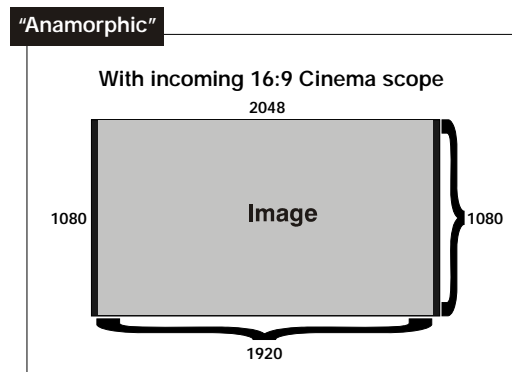
- **Full Width** - fills the display from left-to-right without changing the original aspect ratio of the image. Depending on the source, data at the top and bottom may be discarded (cropped), or the display may have black borders at the top and bottom.



- **Full Height** - fills the display from top-to-bottom. Depending on the source, this may create borders.



- **Anamorphic** - displays an incoming image with a 16:9 aspect ratio without the use of an anamorphic lens mount. The image fills the screen from top-to-bottom, and be centers the image with black bars on each side.



- **Custom** - this option appears when the size, vertical stretch, H-Position, V-Position or blanking values do not match the preset values.

### 6.4.2 Size

Adjusts the image width and height together while maintaining the aspect ratio of the input source.

### 6.4.3 Vertical Stretch

Adjusts the height of the image while maintaining the width of the input source.

### 6.4.4 Pixel Track

Defines the frequency of the pixel-sampling clock. By default, the projector samples at the correct frequency for most sources.

### 6.4.5 Pixel Phase

Adjusts the phase of the pixel-sampling clock relative to the incoming signal.

### 6.4.6 H-Position

Moves the image right or left within the area of available pixels. The value you enter represents where the approximate center of the image lies in relation to the total number of pixels available horizontally. This location is determined by the input signal.

### 6.4.7 V-Position

Moves the image up or down within the area of available pixels. The value you enter represents where the approximate center of the image lies in relation to the total number of pixels available vertically. This location is determined by the input signal.

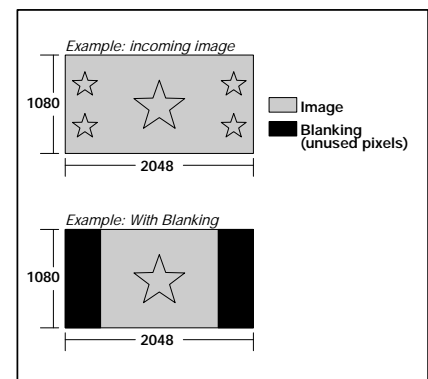
### 6.4.8 Advanced Size and Position Menu

The **Advanced Size and Position** menu includes these options:

Advanced Size & Position				
Active Input Window		720x483		
1.	Top Blank	0	<input type="text"/>	
2.	Bottom Blank	0	<input type="text"/>	
3.	Left Blank	0	<input type="text"/>	
4.	Right Blank	0	<input type="text"/>	
5. Plug & Display <EDID>		Native Resolution 60Hz ▼		

**Figure 6-6 Advanced Size and Position Menu**

- **Active Input Window** - the current size of the region of interest that is defined by the blanking settings. For example, if you crop 100 pixels from both the left and right edges of an incoming 2048 x 1080 source, the active input window is 1848 x 1080. For input sources connected to **INPUT 3** or **INPUT 4**, the default blanking value (zero) defines an active input window of 720 x 483.
- **Top, Bottom, Left, and Right Blank** - defines the size of the active input window. The amount of adjustment you can make is determined by the resolution of the input source.



**Figure 6-7 Blanking of a Primary Image**

- **Plug and Display (EDID)** - uses the extended display identification data (EDID) provided by the projector to display the image. To override this data and display the image in a different format, select a predefined resolution from the list. All networked projectors use this setting.

1. 1400x1050x60Hz
▶ 2. 720p (1280x720x60Hz)
3. DC2K (2048x1080x60Hz)
4. 1024x768x116Hz 3D
5. 1280x1024x110Hz 3D
6. 1400x1050x102Hz 3D
7. 1080p 60Hz / 1080i 60Hz
8. 1080p 50Hz / 1080i 50Hz
9. 1080p 24Hz / 1080i 30Hz

## 6.5 Image Settings Menu

Use the **Image Settings** menu to alter your image without affecting its size or position. Changes are applied immediately and are saved when you exit the menu. Options not available for the projector model or source are disabled.

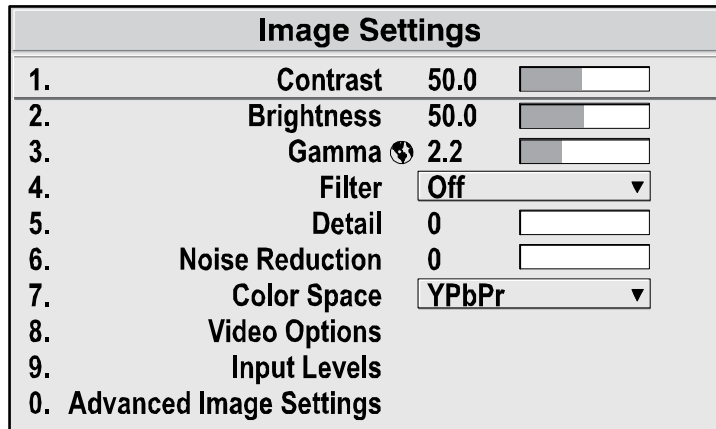


Figure 6-8 Image Settings Menu

### 6.5.1 Contrast

Increases or decreases the perceived difference between the light and dark areas of your image (0-100). Use 50 for the best results. If you set the contrast too high, the light parts of the image lose detail and clarity. If you set the contrast too low, the light areas are not as bright as they could be, and the overall image is dim.

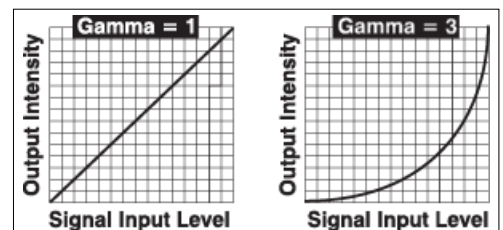
### 6.5.2 Brightness

Increases or decreases the amount of black in the image (0-100). Use 50 for the best results.

### 6.5.3 Gamma

Defines what gray shades are displayed between minimum input (black) and maximum input (white) for all signals. A good gamma setting helps to optimize blacks and whites while ensuring smooth transitions for other color values.

A setting of **2.2** is correct for most signals and conditions. If excess ambient light washes out the image and it becomes difficult or impossible to see details in dark areas, lower the gamma setting. If the image is washed out and unnatural, with excessive detail in black areas, increase the **Gamma** setting.



### 6.5.4 Filter

Applies a low pass filter to reduce noise on incoming HDTV or SDTV signals. This setting reduces pixel phase noise and signal bandwidth.

- |          |
|----------|
| ▶ 1. Off |
| 2. HDTV  |
| 3. SDTV  |

### 6.5.5 Detail

Adjusts the sharpness of a video image so that edges remain clearly defined.

### 6.5.6 Noise Reduction

Applies a low pass filter to reduce noise on incoming HDTV or SDTV signals. Higher settings are useful for clearing up noisy images from input sources such as computers. Reducing noise can also soften the image.

### 6.5.7 Color Space

Determines how the color components of an analog input signal or digital signals connected to **INPUT 1**, **INPUT 2**, **INPUT 5**, or **INPUT 6** are decoded. For most digital signals or for signals connected to **INPUT 3** or **INPUT 4**, the color space function is automatic and the list is disabled.

- |                  |
|------------------|
| ▶ 1. RGB         |
| 2. YPbPr (Video) |
| 3. YPbPr (HDTV)  |

- Select **RGB** unless you are using component video at **INPUT 1**, **2**, **5**, or **6**.
- Select **YPbPr (Video)** with a standard definition televised signal (SDTV)
- Select **YPbPr (HDTV)** with a high definition televised signal (HDTV).

When certain RGB signals are first connected, the projector may not initially recognize them as RGB and incorrectly decodes their color information as YPbPr (video). These signals can include:

- RGB signals in NTSC, PAL, SECAM frequency ranges
- Scan-doubled sync-on-green
- Scan-quadrupled sync-on-green

For these signals, change the Color Space to RGB, then define a new channel for future use.

### 6.5.8 Video Options

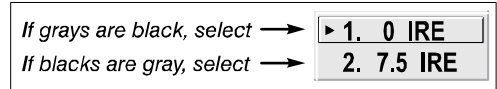
This menu is used with devices connected to **INPUT 3** or **INPUT 4**. The **Video Options** menu includes these options:

- **Enable Decoder AGC** - activates the AGC circuit on the decoder and ensures a bright image. Clear this setting if a decoded video image exhibits color artifacts such as stripes in highly saturated colors.
- **Video Standard** - applies a different regional video standard to the incoming signal. The Auto setting is recommended unless there is a poor quality input signal or the video signal is black-and-white.

STANDARD	REGION
NTSC	N. America and Japan
NTSC 4.43	A tape-only standard for partially-translated hybrid signals
PAL	Most of Europe, China, Australia, some of S. America, some of Africa
PAL-M	Brazil
PAL-NC	Argentina, Chile, other Latin American countries
PAL 60	Most of Europe
SECAM	France, Eastern Europe, most of Africa



- **Input Video Black** - compensates for incoming elevated black levels present in certain video signals, and ensures that blacks in the display are neither crushed (dark grays appear black) or excessively elevated (blacks appear dark gray). By default, the projector automatically determines the best setting according to the type of incoming video signal:



- **0 IRE** - Used for DVD output with "enhanced black", SECAM, most PAL standards, and Japanese NTSC.
- **7.5 IRE** - Used for most NTSC video signals.

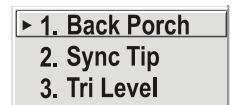
If blacks appear crushed when the brightness setting is 50, choose **0 IRE**. If blacks appear excessively elevated, choose **7.5 IRE**.

- **Color** - adjusts the color saturation level in a video image. Lower settings produce less saturated colors. If the color level is too high, colors are overpowering and unrealistic.
- **Tint** - adjusts the red and green color hue for true color reproduction of video and HDTV signals connected to **Input 3** or **Input 4**. For best results, leave the tint setting at its default value.
- **Decoder Luma Delay** - delays the luma signal (intensity) in relation to the chroma (color) of composite or S-video signals. Increasing the luma delay moves luma to the right. Decreasing the luma delay moves the shadow to the left. If necessary for your current source, adjust so that no shadows occur with adjacent colors.

### 6.5.9 Input Levels

It is recommended that only experienced users adjust the projector input levels. Before adjusting the input levels, verify that the contrast and brightness settings are at 50 and that you have correctly calibrated the color temperature with an internal grayscale. The **Video Options** menu includes these options:

- **Auto Input Level** - adjusts the color temperature and input level of an input source. When you are finished with your adjustment, clear the check box and tap **EXIT**.
- **Blacklevels and Drives** - adjusts the black level and drive settings of an input source.
- **Auto Color Enable** - automatically enables the corresponding color in the display.
- **Clamp Location** - brightens high-resolution and high-frequency input images. Select **Back Porch** if the image is sufficiently or overly bright. Select **Sync Tip** if the image appears unusually dim, if there are horizontal streaks across the image, or if there is significant color drift. Typically, you select **Tri Level** for an HDTV input.
- **Peak Detector** - defines individual input levels. When you select the **Input Peak Detector** option, only black and white pixels are detected; all other levels display as mid-level grey.
- **Color Enable** - defines the colors that appear in the image.

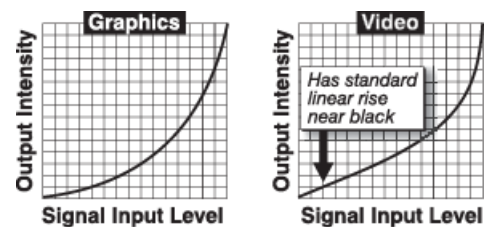


### 6.5.10 Advanced Image Settings

The **Advanced Image Settings** menu includes these options:

- **Gamma Table** - Defines what gray shades are displayed between minimum input (black) and maximum input (white) for all signals. A good gamma setting helps to optimize blacks and whites while ensuring smooth transitions for other color values.

A setting of 2.2 is correct for most signals and conditions. If excess ambient light washes out the image and it becomes difficult or impossible to see details in dark areas, lower the gamma setting. If the image is washed out and unnatural, with excessive detail in black areas, increase the **Gamma** setting.



To upload a gamma table to the projector, you must install a Computer-based Arbitrary Gamma and KoRE Librarian software application on your computer. Custom gamma curves are listed in the Gamma Table - Defines what gray shades are displayed between minimum input (black) and maximum input (white) for all signals. A good gamma setting helps to optimize blacks and whites while ensuring smooth transitions for other color values. list.

- **Select Color Adjustment** - defines the color performance settings for all images. Select **Max Drives** to turn off all color adjustments and run the projector at maximum brightness.

Select **SD Video** and **HD Video** to set the output colors red, green, blue, and white to a specific value.

Select **User#** to select a predefined color adjustment setting.

**Color Temperature** specifies a color temperature in degrees Kelvin for the image. A lower number appears as white with a red tint and a higher number appears as white with a blue tint. These are the standard settings:

- 9300K - appears similar to the white on a computer monitor.
- 6500K - the recommended setting for standard and high-definition color video.
- 5400K - the recommended setting for graphics and black and white video
- 3200K - the recommended setting for a projected image appearing on film or illuminated with incandescent lights.

When you adjust the color temperature, the primary colors red, green, and blue are unchanged and the projector displays them as native colors.

- **Simulation 3D** - adjusts image timing for realistic simulation environments.
- **Frame Delay Monitor** - monitors the latency between input and output.
- **Reserved** - No function.
- **3D Stereo Sync Locking** - Not available.
- **3D Stereo Sync Select** - Not available.
- **3D Stereo Sync Delay** - Not available.
- **Frame Lock Enable** - Defines how the projector controls output frame timing. Select **FrameLock** to lock output image frames to the input. Select **Rate Matched** to run the output close to input frequency without locking. Select **Free Run** to set the output frame timing to 60 Hz for all inputs. With frame locking enabled, the image appears black for a short period when you switch to a new input.
- **Warp Latency** - requires the optional Christie TWIST module. See *Christie TWIST* User Manual.
- **Motion Filter** - smooths moving images from interlaced sources. The default Motion Filter setting is Auto and the of incoming source signal determines what motion filter is applied. If your source is noisy or inconsistent, you can override the default **Auto** setting and apply one of these settings:
 

1. Auto
▶ 2. Still
3. Motion
4. Film

  - **Still** - For static images with no motion, such as graphics from a CD.
  - **Motion** - For video images that do not originate from film, or for moving computer-generated images.
  - **Film** - For video images that originated from film. This will optimize image quality and stability.
- **Film Mode Threshold** - determines how sensitively the projector can detect if an incoming video signal originated from film.
- **Detail Threshold** - defines the frequency level the Detail control magnifies high frequencies, which adds details to the image. Raise the threshold to ignore more of these high frequencies, and lower the threshold to magnify more of these frequencies. For example, a setting of zero means no noise is ignored and all is magnified. An ideal detail threshold is one in which high frequencies that are causing objectionable noise are not magnified when using "Detail", but frequencies which can help sharpen an overly-soft image are magnified when using "Detail".

### 6.5.11 Channel Setup Menu

The **Channel Setup** menu lists all available channels and the input source they are associated with. You can create and store a maximum of 99 channels. You can use the channel menu to edit, copy, and delete channels.

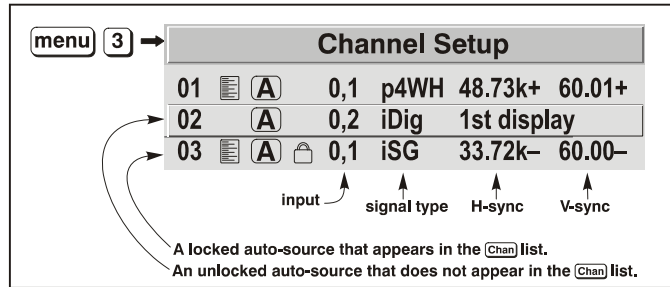


Figure 6-9 Channel Setup Menu

The right columns display the horizontal and vertical frequencies or the name of the channel.

This table lists the abbreviations used in the **Channel Setup** menu to identify the signal type associated with the channel.

The abbreviations are preceded by an **i** (interlaced signals) or **p** (progressive signal).

	Appears in <b>Chan</b> list
	Auto-source
	Locked

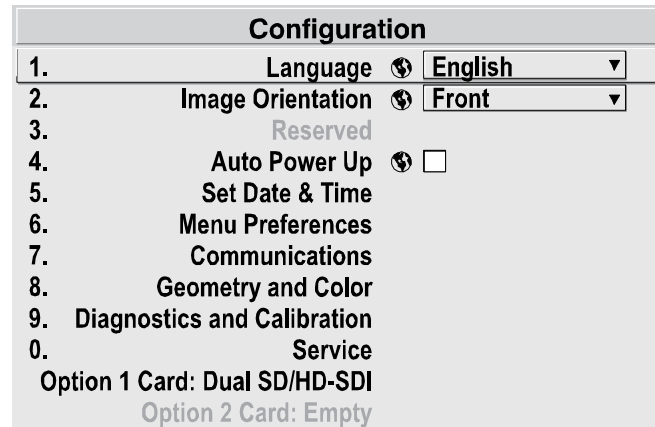
Table 6.1 Signal Type Abbreviations

CODES	SIGNAL TYPE
4WH	Composite (4 wire) on HC input
4WV	Composite (4 wire) on V input
SG	Sync-on-green
5W	Separate H,V
5WR	Separate H,V swapped
SVid	S-Vid
CVid	Composite Video
Dig	Digital

To copy or delete a channel, press **FUNC** on the remote. To edit a channel, select it and press **ENTER**.

## 6.6 Configuration Menu

You use the **Configuration** menu to view or adjust projector settings.



### 6.6.1 Language

Changes the language used in the projector menus

### 6.6.2 Image Orientation

Changes the orientation of the image.

### 6.6.3 Auto Power Up

When this option is selected and a power interruption occurs, the projector resumes operation in the same state it was in before the interruption.

### 6.6.4 Set Date and Time

Resets the projector calendar and clock.

### 6.6.5 Menu Preferences

The **Menu Preferences** menu includes these options:

- **Large Menu Font** - increases the size of the menu text.
- **Menu Location** - defines the location of the on-screen projector menus.
- **Horizontal and Vertical Shift** - moves projector menus horizontally or vertically
- **Display Channel List** - displays a channel list when you press **CHAN**. A list icon in the **Channel Setup** menu indicates the channel is included in the list.
- **Display Sliderbars** - adds a slide bar to the current image when you adjust an image setting such as contrast or brightness.
- **Display Error Messages** - select **Screen** or **All** (default) to see error messages on-screen. Select **Serial Ports** to receive messages via RS-232 or RS-422 serial communication. Select **Off** or **Serial Ports** to hide error messages.
- **Splash Screen Setup** - Defines when a welcome screen appears. These are the available options:
  - **Always Off** - A welcome screen never appears
  - **Always On** - A welcome screen always appears behind the current image.
  - **Start-up Only** - A welcome screen appears when you start the projector.
  - **Startup and No Signal** - A welcome screen appears when you start the projector and there is not an input signal.

You use the KoRE Librarian to upload a custom welcome screen bitmap to the projector. Uploading a custom welcome screen removes all existing welcome screens. Only a single welcome screen can be saved in the projector.

### 6.6.6 Communications

The **Communications** menu includes these options:

- **Baud Rates** - determines the communication speed of RS-232 or RS-422 serial connections. The maximum rate for both connections is 115200. Set the projector baud rate to the baud rate of the input device.
- **Projector** - the three-digit number assigned to the projector.
- **Network Routing**
  - **Separate** - prevents RS232, RS422, and Ethernet messages from broadcasting on different types of ports.
  - **RS232 and RS422 Joined** - messages originating from RS-232 or RS-422 inputs to are sent to the RS-232 and RS-422 ports.
  - **RS232 and Ethernet Joined** - messages from the RS-232 port are sent to the Ethernet port. This setting isolates RS-422 communications.

Communications		
1.	Baud Rate for RS232	115200
2.	Baud Rate for RS422	115200
3.	Projector	004
4.	Network Routing	All Joined
5.	Ethernet Settings	
6.	Broadcast Key	<input type="checkbox"/>
7.	Backlight	<input type="checkbox"/>
8.	Front IR Protocol	Any
9.	Back IR Protocol	Any
0.	Wired Keypad Protocol	Off

▶ 1. Separate	= Networks do not communicate with one another
2. RS232 and RS422 joined	= Serial networks are joined, but Ethernet is isolated
3. RS232 and Ethernet joined	= RS232 and Ethernet are joined but RS422 is isolated
4. All joined	= Network communications travel all networks

- **All Joined** - sends all messages to all ports.
- **Ethernet Settings**
  - **DHCP Enabled** - the DHCP server automatically changes the default IP address (0.0.0.0) of the projector to a unique IP address.

Ethernet Settings		
1.	DHCP Enabled	<input checked="" type="checkbox"/>
2.	IP Address	000.000.000.000
3.	Port	3002
4.	Subnet Mask	000.000.000.000
5.	Default Gateway	000.000.000.000
6.	Network Name	<input type="text"/>
7.	ArtNet Interface Settings	

= Projector's IP address will be DHCP-assigned  
 = Use static address assigned in "IP Address"

- **IP Address** - defines the IP address for the projector. When you enter an address, all existing IP addresses are deleted. If you change the IP address of the projector, restart the projector.
- **Port** - defines the port used by the projector for network communications. The default is 3002. It is recommended that you use a number below 1000.
- **Subnet Mask** - defines the subnet for the IP address. This value is automatically assigned when DHCP is enabled.
- **Default Gateway** - The IP address of the gateway used to reach remote IP addresses.

- **ArtNet** - ArtNet is an Ethernet communication protocol developed by Artistic Licence. It is used for controlling lighting and staging equipment from a lighting console or Computer application.
  - **ArtNet Subnet** - Specifies the ArtNet subnet to which the projector belongs.
  - **ArtNet Universe** - Specifies the ArtNet universe to which the projector belongs.
  - **ArtNet Channel** - The ArtNet channel associated with the projector.
  - **ArtNet Advanced Mode** - When enabled, the projector listens for data on 64 channels starting with the base channel. When ArtNet Advanced Mode is not enabled, the projector only listens on 10 channels.
  - **ArtNet Base Channel** - When advanced mode is enabled, the projector listens to data on 64 consecutive channels, or 10 consecutive channels when **Advanced** mode is not enabled. The projector processes requests that come on either 10 or 64 consecutive channels beginning with the 'base channel' defined here. The requests implement the following functions:

DMX CHANNEL	FUNCTION	VALUE	VALUE
Base	Shutter	0 – 64	Open
		65 – 192	No Action
		193 – 255	Closed
Base + 1	Slider Lock	0 – 254	Locked
		255	Unlocked *
Base + 2	Input *	1 – 8	Input #
Base + 3	Channel *	1-99	Channel #
Base + 4	Lens – Vertical * †	0	Lens Down
		1 – 254	Stop
		255	Lens Up
Base + 5	Lens – Horizontal * †	0	Lens Right
		1 – 254	Stop
		255	Lens Left
Base + 6	Lens – Focus * †	0	Negative Focus
		1 – 254	Stop
		255	Positive Focus
Base + 7	Lens – Zoom * †	0	Zoom Out
		1 – 254	Stop
		255	Zoom In
Base + 8	Power *	0	Power Off
		1 – 254	No Action
		255	Power On
Base + 9	None		

\* Functions are only active when the **Slider Lock** is set to **Unlocked**.

† Lens functions have no effect on the Roadie HD+35K.

**NOTE:** *It is important to make sure the channels DO NOT overlap another device.*

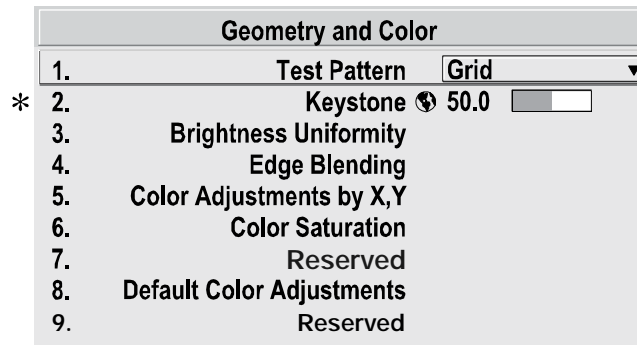
Example:

Good	Bad
Proj1_Base = 0	Proj1_Base = 5
Proj2_Base = 10	Proj2_Base = 9
Proj3_Base = 20	Proj3_Base = 11

- **Device Name** - the name of each device.
- **Device Description** - a description of the device.
- **Broadcast Key** - relays projector keystrokes to other projectors on the network.
- **Backlight** - turns keypad lighting on or off.
- **Wired Keypad** - select **On** to enable the wired remote connected to the rear of the projector or the side input panel. The projector responds to incoming commands from either port. To disable the wired remote, use the projector keypad to select **Off**.

### 6.6.7 Geometry and Color

The **Geometry and Color** menu includes these options:



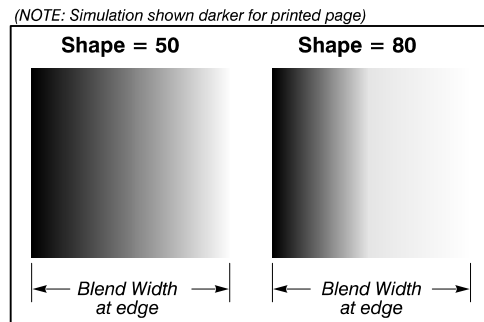
\* *Keystone and Warping if ChristieTWIST warping module is present (standard in Matrix models, optional in all others).*

- **Test Pattern** - selects a test pattern. Select OFF to turn a test pattern off.
- **Keystone** - corrects a keystone image.

**NOTE:** *If the optional Christie TWIST module is installed, this option is Keystone and Warping, and activates a secondary menu for defining custom image shapes. Please refer to documentation included with your Christie TWIST module.*

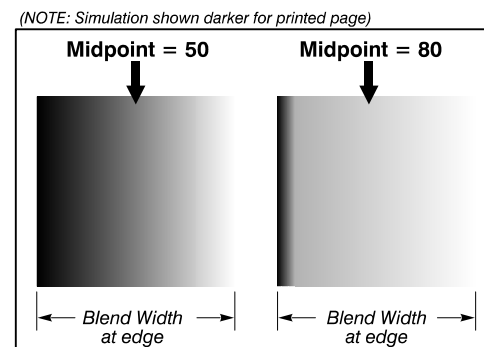
- **Brightness Uniformity** - Brightness Uniformity provides further refinement of displays already matched for their primary colors and overall light output. Use **Brightness Uniformity** option to create an exceptionally smooth image in which no area appears brighter and/or more red, green or blue than another. In the **Brightness Uniformity** menu, select the "Uniformity Enable" check box to access a multitude of adjustments for critical color light output control in specific areas throughout the image. Your settings apply as long as the "Uniformity Enable" check box is enabled and you are using a "User" color temperature defined by the Brightness Uniformity controls. To disable the Brightness Uniformity function, delete the "Uniformity Enable" check mark.
- **Edge Blending** - smooths the overlapping edges of multiple adjacent images to create a single image.
  - **Blend Width** - determines how much area is used for blending along an overlapping edge. For best results, use a blend width of 16-48 steps (128-384 pixels).

- **Blend Shape** - determines how quickly the white levels across the blend change from light to dark. For best results, use a value of 50.



**Figure 6-10 Shape Examples**

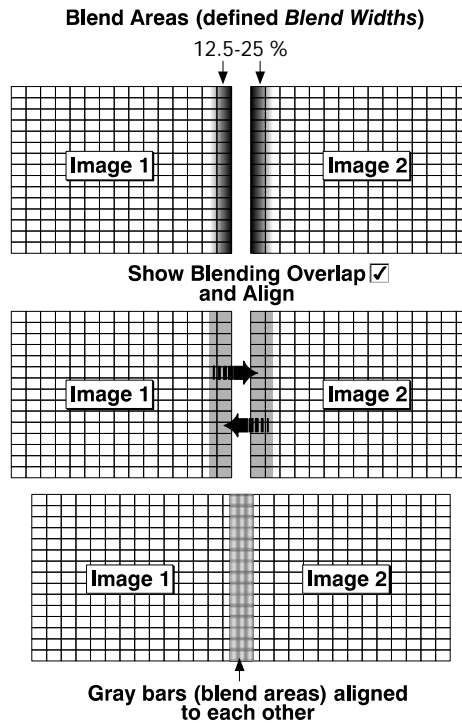
- **Blend Midpoint** - determines the white level at the point equidistant between the beginning and end of the blend. Increasing the Blend Midpoint setting creates a blend that appears brighter than the rest of the image. Decreasing the Blend Midpoint setting creates a blend that is darker than the rest of the image. For best results, use a value of 50.



**Figure 6-11 Midpoint Examples**



- **Show Blending Overlap** - turns the blend width area to solid gray so that two adjacent images can be aligned by overlapping their gray bars.

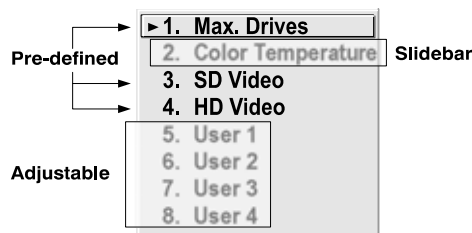


**Figure 6-12 Overlap Example**

- Color Adjustments by X/Y and Color Saturation Secondary Menus

**NOTES: 1)** For defining or changing a User 1, 2, 3, or 4 color palette or gamut. Sometimes known as Comprehensive Color Adjustment™. **2)** Factory-defined primary color levels, which ensure a specific color performance from projector-to-projector, can be altered in the Service menu only. If you suspect alteration of these defaults, the factory settings can be recovered with selection of "Reset to Factory Defaults?" in the Color Primary Settings secondary menu accessed via the Service menu (password protected).

From the factory, the projector can utilize any of the 3 pre-defined color performance settings identified at right (default=Max Drives), or colors can be driven on the basis of color temperature. For most applications, one of these options will produce accurate and realistic colors from a variety of sources. They can be applied at any time in the **Advanced Image Settings** menu ("Select Color Adjustment"), and are not adjustable.



**Figure 6-13 Color Performance Choices**

In some cases, you may find that none of the pre-defined "Select Color Adjustment" options exactly suit your needs. For example, you may require a unique color range or gamut for a single projector or application, or you may need to precisely match colors across multiple adjacent displays. In such cases, use the **Color Adjustments by X,Y** or **Color Saturation** secondary menus to define the precise hue of each primary color component (red, green, blue, and white) used to generate the millions of colors produced in displays. You can create up to four custom color gamuts (User 1, 2, 3, or 4) with these adjustments.

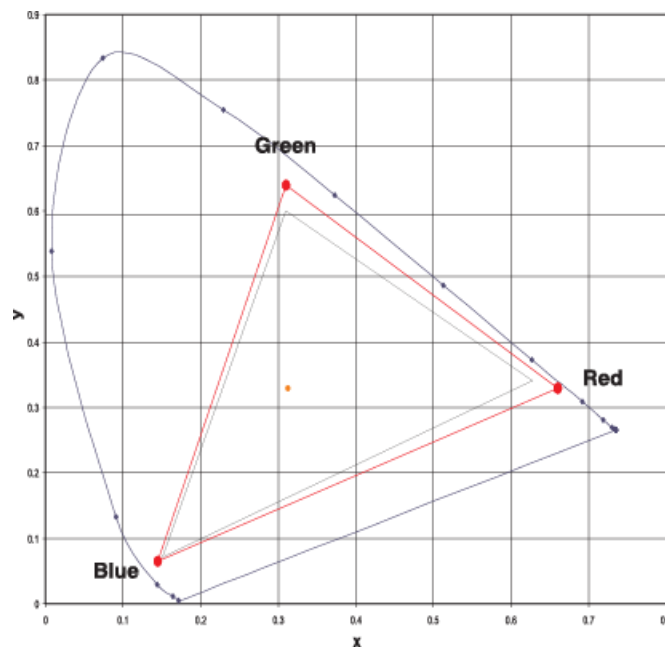
**NOTE:** *The two menus differ only in their user interface, so use whichever menu best suits your needs and application.*

- **Color Adjustments by X,Y** - Enter known x/y coordinates from the chromaticity graph.
- **Color Saturation** - Adjust color slide bars and judge image color by eye or meter.

A user-defined color "adjustment" can be applied for a source by selecting the desired "User" option in the "Select Color Adjustment" list accessed in the **Advanced Image Settings** menu.

- **Color Adjustment By X,Y** - alter, add or copy a color gamut. Controls in this menu define the precise hue of each primary color component (red, green, blue, and white) used to generate the millions of colors produced in displays.

The x/y coordinates for each color define its location on the standard CIE chromaticity graph (*Figure 6-14*). Changing either or both of these numbers changes the hue of the color, and relocates the "triangle" for possible colors. For example, changing the x/y coordinates for red will either move the color closer to orange or closer to violet, which in turn affects all displayed colors having a red component. Adjust the slide bars or enter new specific coordinates as desired to define or change up to four "User" color gamuts needed for your environment and applications. Apply at any time in the **Advanced Image Settings** menu.



**Figure 6-14 CIE 1931 Chromaticity Diagram**

**NOTE:** *Keep new x,y coordinates within the original color gamut triangle shown here.*

### 6.6.8 Color Saturation

Use the **Color Saturation** menu if you are not using specific color coordinates and are judging color performance by eye or meter. Each color control defines new x and y coordinates for the selected color and changes its hue.

Adjust the hue of each primary color (red, green, blue, and white) by using more or less of it in relation to the other colors. Apply at any time in the **Advanced Image Settings** menu.

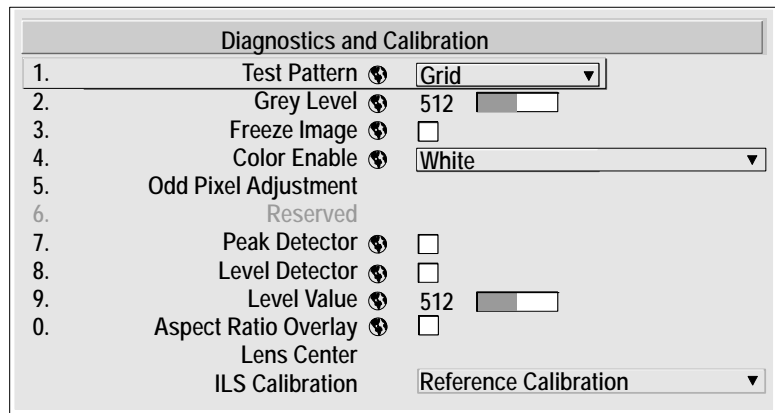
**NOTE:** A *Color Saturation* adjustment defines the corresponding x/y coordinates shown in the *Color Adjustments by X,Y* secondary menu. These x/y coordinates remain stable for this "User" gamut until they are changed again via either menu. Values displayed in the *Color Saturation* menu, however, will likely fluctuate as you use the projector, and will be different when you return to this menu at some point in the future. These floating changes do not affect the x/y coordinates or gamut.

- Default Color Adjustments - See [Section 6.6.7 Geometry and Color](#).

**Reserved** - No function.

### 6.6.9 Diagnostics and Calibration

- **Test Pattern** - Choose the desired internal test pattern to display, or select **OFF** to turn off a test pattern. Alternatively, use the **TEST** key for cycling through test patterns.
- **Grey Level** - Set the desired level of gray for displaying in the full gray field test pattern.



**Figure 6-15 Diagnostics and Calibration**

- **Freeze Image** - Enter a check mark to freeze (stop) an image at a single frame. This diagnostic tool is useful if you need to examine in detail a still version of an incoming image that cannot be "frozen" at the source. For example, in moving images it is sometimes difficult to observe artifacts such as external deinterlacing/resizing and signal noise. Remove the check mark to return back to normal.
- **Color Enable** - Select which color or colors you want to see. This is useful while working with color temperature, input levels or other special setup parameters. Colors can also be enabled or disabled by entering the corresponding function code listed on the back of the remote.
- **Odd Pixel Adjustment** - When using certain RGB sources, you may need to adjust the normal gain or offset of odd pixels in relation to even pixels. This smooths out very narrow (1-pixel wide) "checks" or vertical stripes that indicate adjacent "on" and "off" pixels.
  1. Use an external analog native-sized continuous grayscale test pattern with at least 256-levels.
  2. Turn "Level Detector" **ON**.

3. Set "Level Value" to ~200. The image should now be black-and-white (or black-and-one color, if you use "Color Enable" function).
4. Adjust *offset*. Half of the pixels will move, the other half will not.
5. Adjust until the two transition regions overlap. The stripe of noise will be minimized, defined by the value in the slidebar.
6. Set "Level Value" to ~800. The image should now be black-and-white.
7. Repeat Steps 4 and 5, but adjusting gain.
8. Repeat Steps 3-7 for all remaining colors. Your RGB source should now be OK.

Two sets of values are automatically saved with these controls—one value for Input #1, and one for Input #2 (analog). The current set of values depends on which source is in use. This enables a source to be processed correctly via 2 different inputs.

**NOTES: 1)** Adjust *offset* before *gain*, since *offset* affects *gain*. **2)** A value of 128 represents no change in normal odd pixel *offset* or *gain*. **3)** Odd Pixel Adjustment eliminates "1 pixel on, 1 pixel off" patterns only, not any type of larger patterns.

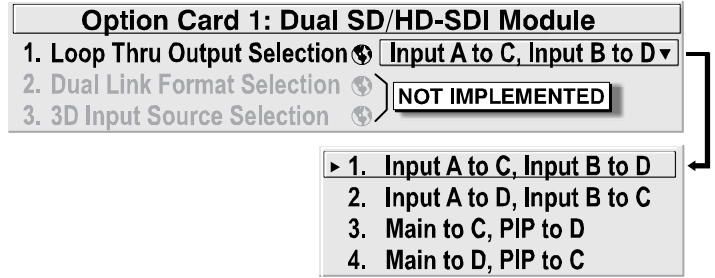
- **Peak Detector** - The **Peak Detector** is fast method of defining individual input levels, and can improve the accuracy of input levels set by the Auto Input level function. Enabling the Peak Detector activates a special operating mode for detecting only pixels that are considered black or white—all other levels are displayed as a mid-level gray. When used with a 16-step grayscale pattern in which the two black and white bands are known to be at opposite edges of the image, you can watch these isolated areas while adjusting individual blacklevels and input drives until both bands are just visible. Images from this source then display blacks and whites correctly without crushing or washing out.
- **Level Detector** - The **Level Detector** check box enables a specific thresholds for blacks and whites—input levels that fall below a specified Level Value (see below) are displayed as black, and all others are displayed as white. It aids in *Odd Pixel Adjustment*.
- **Level Value** -The *Level Value* defines the value to be used by the Level Detector in recognizing blacks and whites.
- **Lens Center** - Lens Center moves the horizontal and vertical lens offsets to their center position.
- **Lens Calibration** - Reference calibration determines a reference point that is used as a defined starting position for relative motion of the lens. All positioning is measured from this reference point.

**⚠ CAUTION** Lens calibration must be performed each time a new lens is inserted or after performing manual lens mount adjustments. To calibrate the lens, select the Configuration > Diagnostics and Calibration > ILS Calibration > Reference Calibration option from the Main menu. This is critical to the projector functioning properly. Failure to do so could result in damage to the lens mount, the projector, or the projection lens.

To calibrate the lens, select the *Configuration > Diagnostics and Calibration > ILS Calibration > Reference Calibration* option from the *Main* menu. This allows the lens to find the center points of each axis (focus, zoom, horizontal, and vertical), the end stops, and other motion parameters.

### 6.6.10 System Configuration (Optional Input Modules)

The two "Option Card" entries in the **Configuration** menu identify which optional input modules (a.k.a. cards) are present at **INPUT 5** (Option 1) and **INPUT 6** (Option 2). If either of these option slots are empty, the corresponding read-only menu entry does nothing. If there is a module installed, the corresponding menu entry may activate a secondary menu of further options pertaining to that module.



For example, the *Dual SD/HD-SDI* module is factory-installed at **INPUT 5** (Option 1). The **Option 1 Card** secondary menu provides controls for configuring the various connections on this multi-input, multi-output module. As desired for your application, you can define 1) which physical input loops through to which output, and 2) which functional input (main or PIP signal) loops through to which output.

## 6.7 Lamp Menu

Use the **Lamp** menu to optimize lamp performance. You can install 2.0 kW, 3.0kW, 4.5kW, or 6 kW lamps in this projector. To ensure the correct wattage is supplied to the lamp, you must define which lamp size is installed before turning the projector on.

### 6.7.1 Lamp Hours

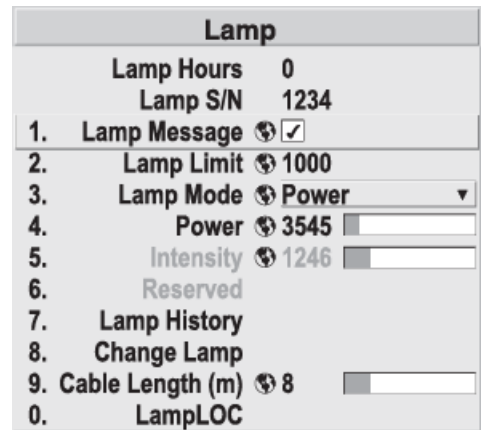
The number of hours the lamp has operated.

### 6.7.2 Lamp S/N

The serial number of the lamp.

### 6.7.3 Lamp Message

Select this option to display a warning message indicating the lamp has operated for the maximum allowable hours and should be replaced when you turn the projector on. It is recommended that you enable this option. Press **EXIT** to temporarily cancel the message. The message continues to appear until you replace the lamp.



### 6.7.4 Lamp Limit

The number of hours the lamp can operate before replacement. This table lists the recommended limits for each lamp size.

LAMP (KW)	REPLACE AFTER
2.0	3000 hours
3.0	2000 hours
4.5	600 hours
6.0	600 hours

### 6.7.5 Lamp Mode

Controls the power and intensity of the lamp.

- **Max Brightness** - the lamp illuminates at 110% of its recommended power level rating. The maximum brightness of a lamp diminishes with age. The current brightness value for the lamp appears in the **Intensity** field. Using maximum brightness can reduce lamp life.
- **Intensity** - maintains a specific lamp brightness for a specific period. As the lamp ages, the projector automatically increases the power supplied to the lamp to maintain your defined intensity setting. This automatic adjustment is known as Brightness Tracking or LiteLOC™. Higher intensity settings can reduce lamp life.
- **Power** - the maximum power supplied to the lamps in Watts. A lower power setting produces a dimmer image.



### 6.7.6 Intensity

The current intensity setting for the lamp.

### 6.7.7 Lamp History

Lists the serial number and the number of operational hours for the current and previously installed lamps. The current lamp appears at the bottom of the list.

### 6.7.8 Change Lamp

Allows you to enter the serial number of a new lamp. See [Section 6.3 Editing Text and Numbers](#) for assistance entering letters and numbers.

### 6.7.9 Cable Length

Defines the length of the high-voltage DC cables that run from the lamp ballast to the projection head. This setting ensures that adequate voltage reaches the lamp. If you are using the same projector in multiple, temporary installations, you must update this setting every time you install the projector. The allowable adjustment range is 2-30 m (6.5-100 ft.).

### 6.7.10 LampLOC

Positions a newly installed lamp for optimized light output. Click **Do Auto** to run LampLOC™ automatically. You must turn the lamp on and let it warm up for a minimum of 10 minutes before running LampLOC. If you turn the lamp off during LampLOC, the lamp returns to its former position. To keep the bulb optimized as it ages, run LampLOC™ once a month.

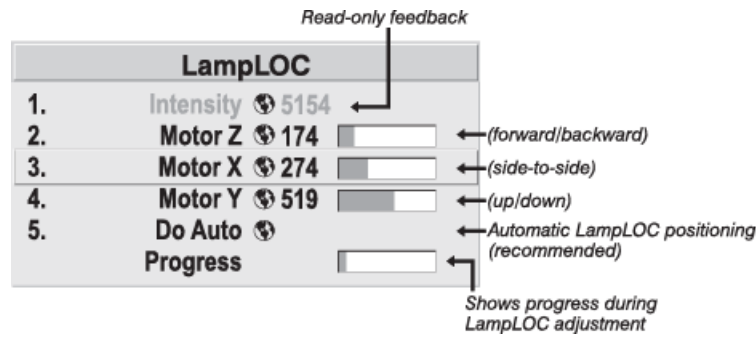


Figure 6-16 Setting LampLOC

To manually adjust the position of the lamp, move the **Motor Z**, **Motor X**, or **Motor Y** sliders. It is recommended that you use a light meter and a 100% white test pattern when adjusting the position of the lamp manually.

### 6.8 Status Menu

Use the **Status** menu to view projector information including the hardware and software installed, the type (size) of lamp defined in projector memory, its current, voltage, and hours logged and the projector model name and serial number. In addition, the **Status** menu identifies the current channel, its location, its frequencies and other details.

### 6.9 PIP and Switching Menu

Use the **PIP and Switching** menu to manage picture-in-picture settings. With picture-in-picture, you can display a small secondary image within a large primary image. To change the settings of the primary image, use the **Main** menu. Follow these recommendations:

- When using 2 digital signals or 1 analog and 1 digital signal, each signal must be 165 MHz or less.
- When using two analog signals, each signal must be 90 MHz or less.
- Do not select an interlaced source for the picture-in-picture window.

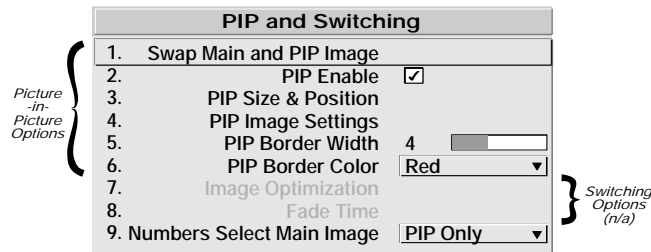


Figure 6-17 PIP and Switching Menu

For the best picture-in-picture image, do not mix two signals of the same type. This table lists the signal types available on this projector:

Signal Type	Description (Input Location)
#1	5 BNCs (RGBHV or YPbPr)
#2	DVI - I (analog or digital)
#3	Decoded signals (Input 3, Input 4, Composite video, S-Video, or any video signal via Input 1 BNC connectors or via an analog option card).
#4	Analog Option Cards
#5	Digital Option Cards
#6	Digital Option Cards

\* HD interlaced sources are not recommended for the picture-in-picture window.

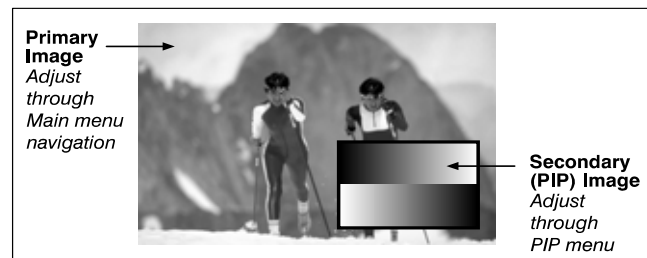
When using picture-in-picture, follow these recommendations:

- When using 2 digital signals or 1 analog and 1 digital signal, each signal must be 165 MHz or less.
- When using two analog signals, each signal must be 90 MHz or less.
- Do not select an interlaced source for the picture-in-picture window. Swap the Main and PIP Image.

Changes the input of the primary image to the input of the picture-in-picture image.

### 6.9.1 PIP Enable

Turns picture-in-picture on or off. It is recommended that you disable picture-in-picture when using interlaced sources greater than 35 kHz.



### 6.9.2 PIP Size and Position

Use the PIP Size and Position menu to adjust the size and position of the picture-in-picture image. These options are available:

- **Position Presets** - Defines the size and location of the picture-in-picture window.
- **Aspect Ratio Presets** - sets the aspect ratio of your picture-in-picture image. Select **Default** or **Anamorphic**.



- **PIP Advanced Size and Position** - advanced settings for defining the size and location of the picture-in-picture window.

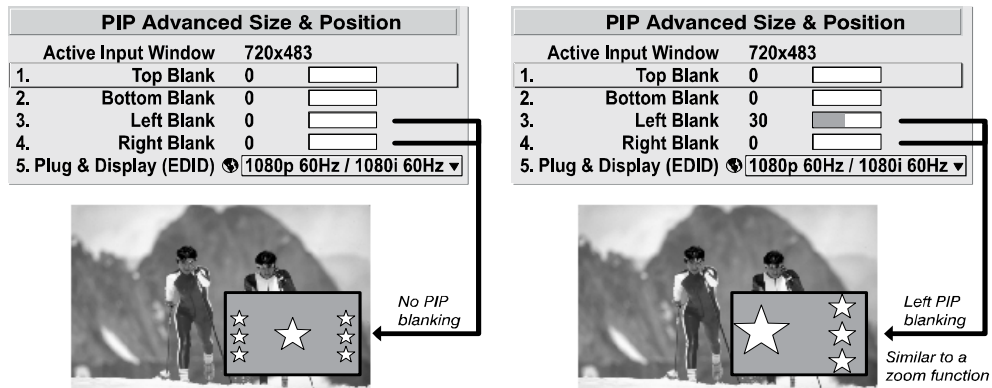


Figure 6-18 Blanking of a PIP Image

### 6.9.3 PIP Image Settings

Adjusts the settings of the picture-in-picture image without affecting its size or position. These settings are not applied to the primary image. For menu descriptions, see [Section 6.5 Image Settings Menu](#).

### 6.9.4 PIP Border Width

Specifies the thickness of the picture-in-picture border. Set the control to zero to remove the border.

### 6.9.5 PIP Border Color

Defines the border color of the picture-in-picture image.

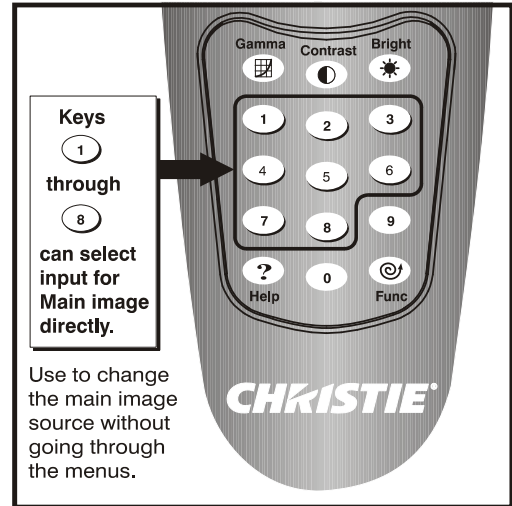
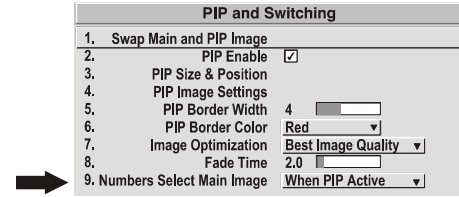
### 6.9.6 Numbers Select Main Image

Select **Always** to use the remote control input keys to display the primary image without returning to the **Main** menu. Select **When PIP Active** to use the remote control input keys to display the primary image only when picture-in-picture is active. The default is **Never**.

**NOTE:** *Numbers Select Main Image functionality works only when projector menus are closed.*

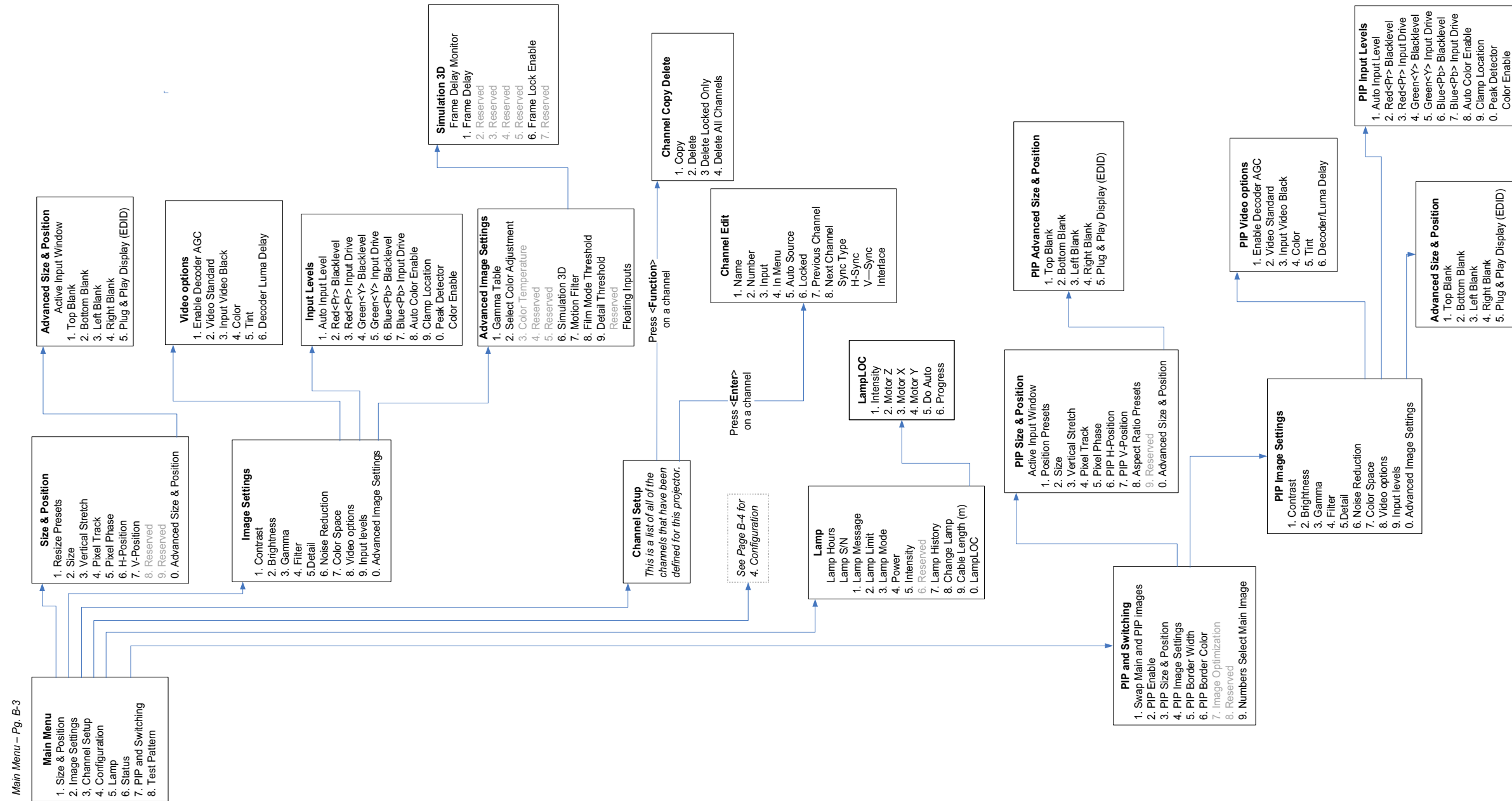
### 6.10 Test Pattern Menu

Use the Test Pattern menu to select test patterns.

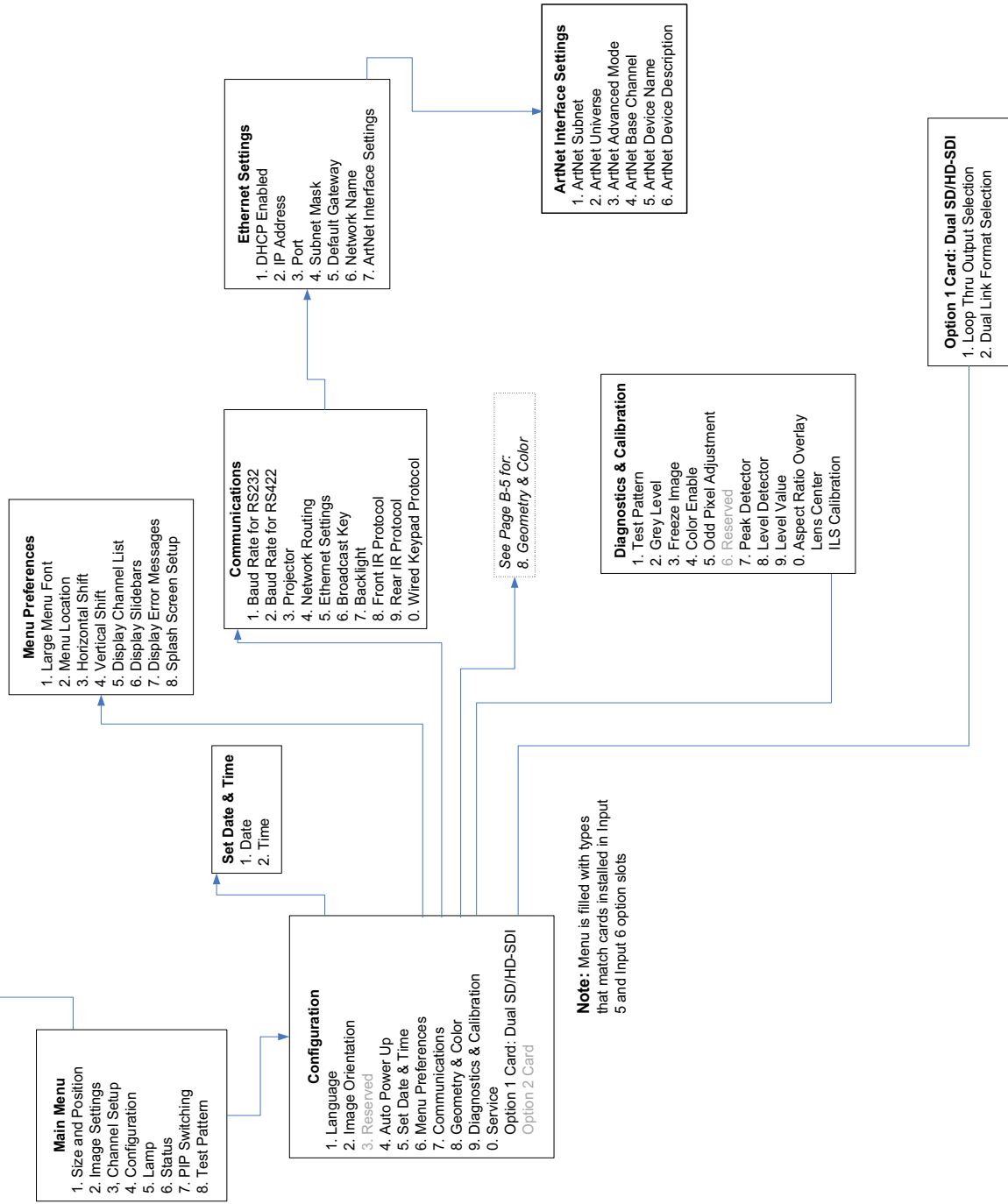


## 6.11 Projector Menu Tree

Provides a graphical representation of the software menu structure for the Roadie HD+35K. This allows you to quickly locate and navigate to a specific menu, and associated options/secondary menus.

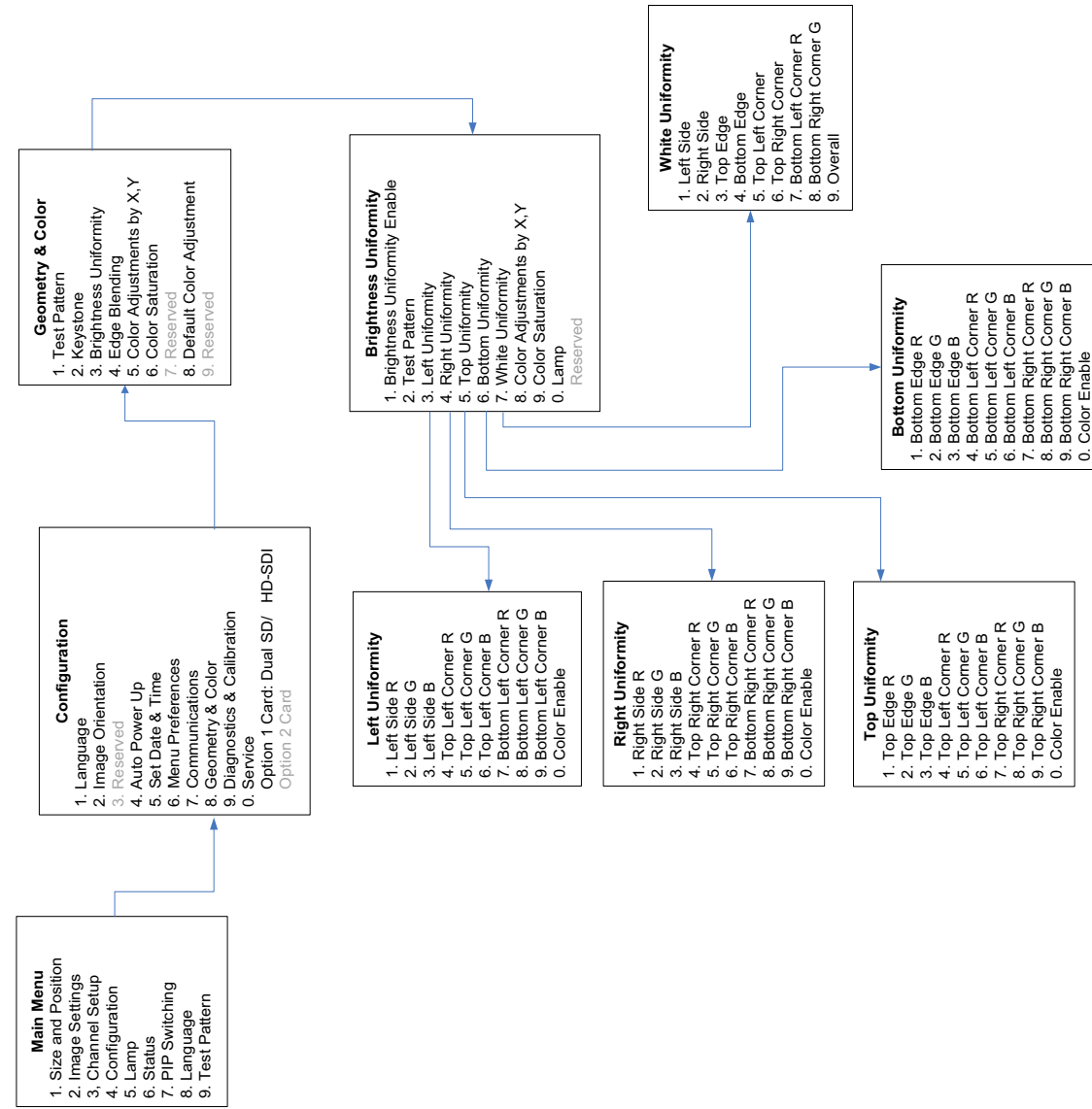


Main Menu continued... Pg. B-4





Main Menu continued... pg. B-6



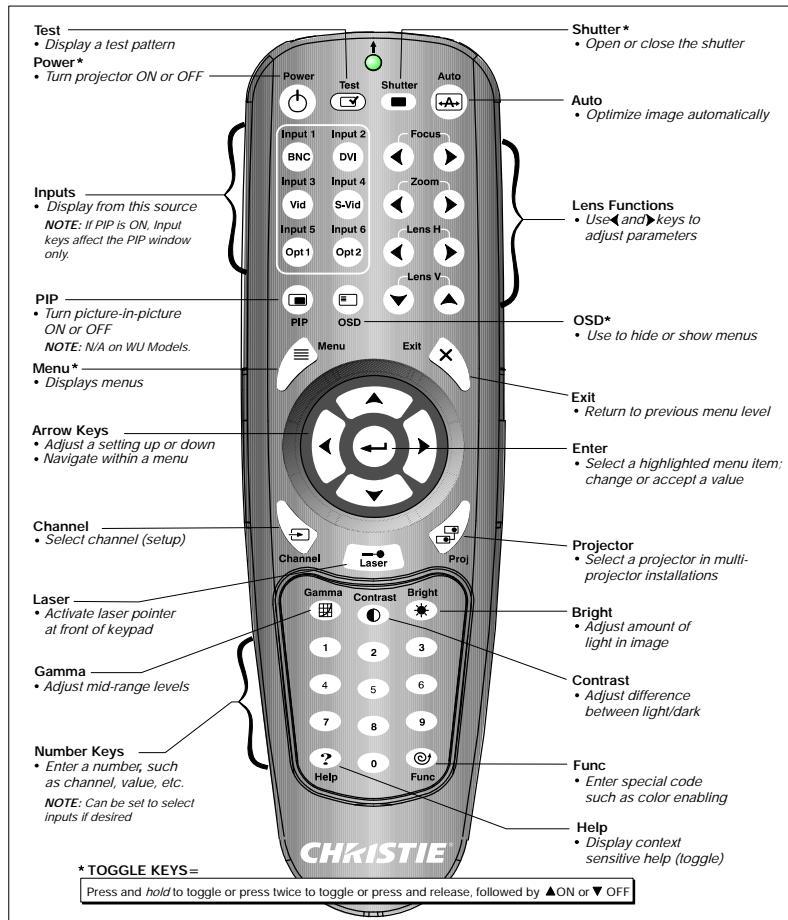
# 7 Using the Remote Control

This section provides information and procedures for using the remote control.

The Roadie HD+35K includes a remote that you can use to control the projector wirelessly from a maximum distance of 50 feet. You can also connect the remote to the projector with a wired connection.

- When pressing keys on the remote, point the remote toward the screen or toward the infrared sensors on the front or rear of the projector.
- Press one key at a time; there are no simultaneous key combinations available.
- To protect against accidental use, the **Power**, **Shutter**, and **OSD** keys are press-and-hold and do not function if you quickly press-and-release the keys.
- If you press a key while the projector is still responding to a previous action, the second key press may not take effect.

## 7.1 Remote Control Key Descriptions



**Figure 7-1**The Remote Control

**Power Key**

Press **POWER** + **UP** to turn the projector ON and ignite the lamp.

Press **POWER** + **DOWN** to turn the projector OFF and extinguish the lamp.

After you turn off the projector, it is recommended that you wait a minimum of three minutes before turning it on. Hot re-strikes of the lamp can reduce lamp life.

**Test Key**

Press **TEST** on to scroll through the test patterns.

**Auto Key**

Press **AUTO** to automatically optimize display parameters, such as the size and position of the image.

**NOTE:** *You cannot use **AUTO SETUP** on a locked channel.*

**Table 7.1 Auto Setup**

OPTIMIZES	SETS TO DEFAULT
Pixel Tracking	Contrast
Pixel Phase	Brightness
Size and Blanking	Auto Input Level (off)
Vertical Stretch	Detail (if video source)
Position	Filter
Input Levels	Luma Delay

**Help Key**

Press **HELP** to display help about the current menu. If a specific help topic is unavailable, a list of general Help topics appears. To exit help, press **HELP** or **EXIT**.

**Channel Key**

Press **CHANNEL** to select a specific channel or scroll through a list of channels. Enter the 2-digit channel number and the display automatically changes and updates according to the parameters defined for the selected channel.

**Input 1 BNC Key**

Press **INPUT 1 BNC** to display an image from the device that is connected to the **INPUT 1** port. If picture-in-picture (PIP) is enabled, press **INPUT 1 BNC** to assign it as the PIP source.

**Input 2 DVI Key**

Press **INPUT 2 DVI** to display an image from the device that is connected to the **INPUT 2** port. If picture-in-picture (PIP) is enabled, press **INPUT 2** to assign it as the PIP source.

**Input 3 Vid Key**

Press **INPUT 3 VID** to display an image from the device that is connected to the **INPUT 3** port. If picture-in-picture (PIP) is enabled, press **INPUT 3** to assign it as the PIP source.



### Input 4 S-Vid Key

Press **INPUT 4 S-VID** to display an image from the device that is connected to the **INPUT 4** port. If picture-in-picture (PIP) is enabled, press **INPUT 4** to assign it as the PIP source.

### Input 5 Opt 1 Key

Press **INPUT 5 OPT 1** to display an image from the **INPUT 5** interface module. This is typically a Dual SD/HD-SDI Module. If picture-in-picture (PIP) is enabled, press **INPUT 5** to assign it as the PIP source. If there are two inputs connected to this module, the second input is **INPUT 7**. To access **INPUT 7**, press **INPUT 5 OPT 1**.

### Input 6 Opt 2 Key

Press **INPUT 6 OPT 2** to display an image from the **INPUT 6** interface module. If picture-in-picture (PIP) is enabled, press **INPUT 6** to assign it as the PIP source. If the Dual SD/HD-SDI module is installed and there are two inputs connected, the second input is **INPUT 8**. To access **INPUT 8**, press **INPUT 6 OPT 2**.

### Contrast Key

Press **CONTRAST + UP** or **DOWN** to change the amount of white in your images.

### Bright Key

Press **BRIGHT + LEFT** or **RIGHT** to increase or decrease the amount of black in the image.

### Gamma Key

Press **GAMMA** to define the gray shades to display between minimum output (black) and maximum output (white) for a given signal. A setting of 2.2 is correct for most signals and conditions. If excess ambient light washes out the image and it becomes difficult or impossible to see details in dark areas, lower the gamma setting. If the image is washed out and unnatural, with excessive detail in black areas, increase the **Gamma** setting.

### Menu Key

Press **MENU** to enter or exit the projector menu.

### OSD Key

Press **OSD** twice quickly to display the on-screen menu. Press **OSD + DOWN** to close the on-screen menu.

### Shutter Key

Press and release **SHUTTER** and then press **UP** to close the mechanical shutter. Closing the shutter turns the display off and reduces lamp power to 60% of the maximum rating for 4.5 kW and 6.0 kW lamps or 75% for 2.0 kW and 3.0 kW lamps.

Press and release **SHUTTER + DOWN** to open the mechanical shutter. Opening the shutter restores lamp power to its previous setting, and restores the image.

### Laser Key

Press **LASER** to activate the laser pointer. The closer you are to the screen, the brighter the point.

### Function Key

Press **FUNC** when you are in a primary or secondary menu to select menu options. For example, pressing **FUNC** in the **Channel Setup** menu enables channel deletion or copying.

Press **FUNC** and then a 2-digit number to enable specific colors in the display. For example, press **FUNC + 6 + 4** to display only red and green data.

You can program the **FUNC** key to trigger real time events or to display custom menus. See *Christie Serial Communications* for more information.

### Projector Key

Press **PROJ** to access a specific projector within a group of projectors, or to confirm if the local projector is listening.

To control a specific projector, enter the 3-digit number assigned to the projector. To broadcast to multiple projectors, press **PROJ** twice.

Func	6	1	= Red
Func	6	2	= Green
Func	6	3	= Blue
Func	6	4	= Red & Green
Func	6	5	= Green & Blue
Func	6	6	= Red & Blue
Func	6	7	= All Colors

### Enter Key

Press the **ENTER** key to select a highlighted menu or option item, to toggle a check box, or to accept a parameter adjustment, and return to the previous menu or image.

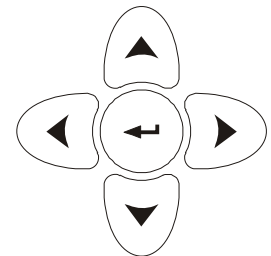
### Exit Key

Press **EXIT** to return to the previous menu.

### Arrow Keys

Use the **RIGHT** and **LEFT** keys to change a slide bar value or check box, or to select a different option within a list.

Use the **UP** and **DOWN** keys to move up or down within a menu, list, or text box.



### PIP Key

**NOTE:** *PIP performance may be limited by certain high frame rate sources.*

Press **PIP** to enable or disable picture-in-picture functionality. When you select **PIP**, you can only make adjustments to the secondary image.

To adjust the main image, press the **PIP** key before making the adjustment. For example, press **GAMMA + PIP** + the **RIGHT** and **LEFT** keys to change the gamma level of the main image.

To remove the secondary image from the display and return to a single image, press **PIP** when no menus or slide bars are displayed.

### Focus, Zoom, Lens H, and Lens V Keys

Press **FOCUS + UP** or **DOWN** to focus the image.

Press **ZOOM + UP** or **DOWN** to increase or decrease the image size.

Press **LENS H + LEFT** or **RIGHT** to position the image horizontally.

Press **LENS V + UP** or **DOWN** to position the image vertically.

Press **EXIT** to return to the presentation level.

## 7.2 Using the Remote Control Cable

Use the remote control cable when the infrared sensors on the projector are obstructed, or when you are using the remote control at a distance greater than 100 feet.

Connect the XLR to mini-stereo cable included with the projector to the remote. Connect the XLR to mini-stereo cable to the 3-pin XLR port on the side of the projector. Open the Communications menu to enable the wired remote control.

When you connect the remote to the projector with a wired connection, remote commands have priority over commands made with the projector keypad.

## 7.3 Replace the Batteries

The remote control uses two AA alkaline batteries. To replace the batteries:

1. Press the latch to open the battery cover on the back of the remote.
2. Remove the old batteries.
3. Insert the new batteries
4. Replace the battery cover.



## 8 Maintenance

This section provides information and procedures for performing projector maintenance. You should read through this section in its entirety before performing maintenance activities. When you perform projector maintenance, obey all warnings and precautions.

**DANGER**

**ELECTRICAL SHOCK HAZARD!** Always turn off, disconnect, and disengage all power sources to the projector before servicing. Failure to comply results in death or serious injury.

**CAUTION**

Only Christie accredited service technicians are permitted to open any enclosure on the projector and only if the AC power has been fully disconnected. Failure to comply could result in minor or moderate injury.

### 8.1 Filling the Liquid Cooler

The liquid cooler system sends and receives coolant from the digital micromirror device (DMD) heat sinks. Check the coolant level every 6 months, by opening the Igniter compartment door. The coolant level should always be half full. If the liquid cooling system fails, the status lights on the projector illuminate to indicate an over-temperature alarm.

Fill the coolant reservoir with the Christie approved coolant **JEFFCOOL E105**. When refilling, use caution not to spill or let any of the coolant drip on or near the electronics. After filling, check the coolant hoses for kinks which might restrict coolant flow. Also, check for air locks in the coolant hoses when you next turn the projector on.

### 8.2 Checking Electrical Connections

Check the electrical connections every 60 days or 500 hours.

1. Disconnect the projection head and ballast from AC power.
2. Check the contact surfaces of the positive (anode) and cathode (negative) connections for cleanliness. Clean electrical contact surfaces as necessary to prevent contact resistance from scorching connectors.
3. Verify that all electrical and lamp connections are tight.

### 8.3 Cleaning Optical Components

Unnecessary cleaning of the projector optics can increase the risk of degrading delicate coatings and surfaces. If you are not a qualified service technician, you can only inspect and clean the lens and lamp reflector. Do not perform maintenance on other optical components. Check these components periodically in a clean, dust-free environment using a high-intensity light source or flashlight. Clean them only when dust, dirt, oil or other marks are obvious. Never touch an optical surface with your bare hands. Always wear latex gloves.

These are the recommend tools for removing dust or grease:

- Soft camel-hair brush.
- Dust-free blower - filtered dry nitrogen blown through an anti-static nozzle.

- Dust-free lens tissue such as Melles Griot Kodak tissues (18LAB020), Opto-wipes (18LAB022), Kim Wipes or equivalent.
- Lens cleaning solution such as Melles Griot Optics Cleaning Fluid (18LAB011) or equivalent.
- Methanol for cleaning the reflector.
- Cotton swabs with wooden stems.
- A microfiber lens cleaning cloth, such as Melles Griot (18LAB024) or equivalent.

### 8.3.1 Cleaning the Lens

A small amount of dust or dirt on the lens has minimal effect on image quality-to avoid the risk of scratching the lens, clean the lens only if absolutely required

#### Removing Dust

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.
2. Fold a microfiber cloth and wipe the remaining dust particles off the lens with the smooth portion of the cloth that has no folds or creases. Do not apply pressure with your fingers. Instead, use the tension in the folded cloth to remove the dust.
3. If significant dust remains on the lens surface, dampen a clean microfiber cloth with lens cleaning solution and wipe gently until clean.

#### Removing Fingerprints, Smudges, or Oil

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.
2. Wrap a lens tissue around a swab and soak it in lens cleaning solution. The tissue should be damp but not dripping.
3. Gently wipe the surface using a figure eight motion. Repeat until blemish is removed.

### 8.3.2 Cleaning the Lamp Reflector

Inspect the mirror surface (reflector) for cleanliness when you remove the lamp for replacement. Wear protective clothing while inspecting or cleaning. Color variations on the reflector are normal.

#### Removing Dust

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.
2. If some dust remains, leave it. Some dust is inevitable. Avoid unnecessary cleaning.

#### Removing Fingerprints, Smudges, or Oil

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.
2. Fold a clean microfiber cloth and dampen with methanol and wipe evenly with the smooth portion of the cloth that has no folds or creases. Do not apply pressure with your fingers. Use the tension in the folded cloth to remove the dust.

## 8.4 Cleaning the Igniter

Check the high voltage terminal and insulator for accumulated dust or dirt every six months, or more frequently in dusty environments.

## 8.5 Inspecting and Cleaning the Vane Switches

The lamp fan vane switch is located in the lamp-cooling compartment. The extractor vane switch is located inside the top duct on the projector lid. Inspect and, if necessary, clean the vane switches to remove accumulated dust or dirt that could impede movement.

## 8.6 Replacing the Lamp

Use the **Status** or **Lamp** menus to determine the age of the lamp. It is recommended that you replace the air filter when you replace the lamp, or sooner in dusty or dirty environments.

**NOTE:** For this procedure, you need a compatible Christie Xenon CDXL or CXL lamp. NEVER install a lamp intended for a different projector.

**⚠ WARNING** Make sure to use the correct wattage lamp supplied by Christie.

**⚠ WARNING** Lamp replacement is to be done by a Christie accredited service technician only.

**⚠ WARNING** Explosion Hazard. Wear authorized protective clothing whenever the lamp door is open! Never apply a twisting or bending force to the quartz lamp body.

1. Press and hold the POWER button to turn the projector off.
2. Allow the lamp to cool for a minimum of 10 minutes.

**⚠ WARNING** Never remove the lamp when it is hot. The lamp is under high pressure when hot and may explode, damaging the projector or causing personal injury.

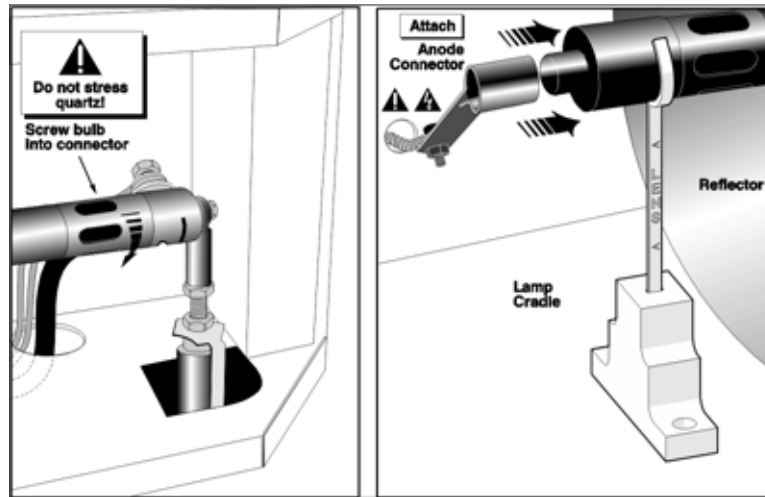
3. Turn the ballast breaker/switch off.
4. Disconnect the projection head and lamp ballast from AC power.
5. Wearing protective clothing and a face shield, unlock and open the lamp door. Release the tethered latch mechanism to remove the door entirely.
6. Unscrew the knob on the lamp cooling compartment door, and remove the door to reveal the cathode end of the lamp. See [Figure 8-2](#).
7. Remove the lamp:
  - a. Loosen the setscrews from the negative (cathode) and positive (anode) lamp connectors. These screws are shown in [Figure 8-2](#). Apply minimal torque and DO NOT STRESS the quartz tube.
  - b. Carefully slide the positive anode connector off the front of the lamp.
  - c. Holding the cathode end of the lamp, unscrew the lamp from the rear connector and carefully remove from the projector. Immediately place the lamp inside a protective package, seal it in a heavy carton, and put it on the floor where it cannot fall or be bumped.

**⚠ WARNING** Handle box with extreme caution-the lamp is hazardous even when packaged. Dispose of lamp box according to safety regulations for your area.

- d. With the lamp removed, visually inspect the reflector for dust. If it requires cleaning, see [Section 8.3.2 Cleaning the Lamp Reflector](#).
8. Remove the new lamp from its protective cover:
    - a. Remove the tape, knurled nut, and locking star washer (if present) securing the lamp.

- b. Holding the lamp at the ends and remove the lamp from the cover. Store the protective cover for re-use during your next lamp replacement.
9. Install the new lamp:
    - a. Wearing protective clothing and a face shield, insert the threaded cathode (-) end of the lamp into the negative lamp connector nut located in the rear of the lamp compartment. Using both hands, hand-tighten this end into the threaded nut.

**IMPORTANT!** Handle the lamp by the cathode and anode end shafts only, never the glass. Do not over-tighten. Do not stress the glass.

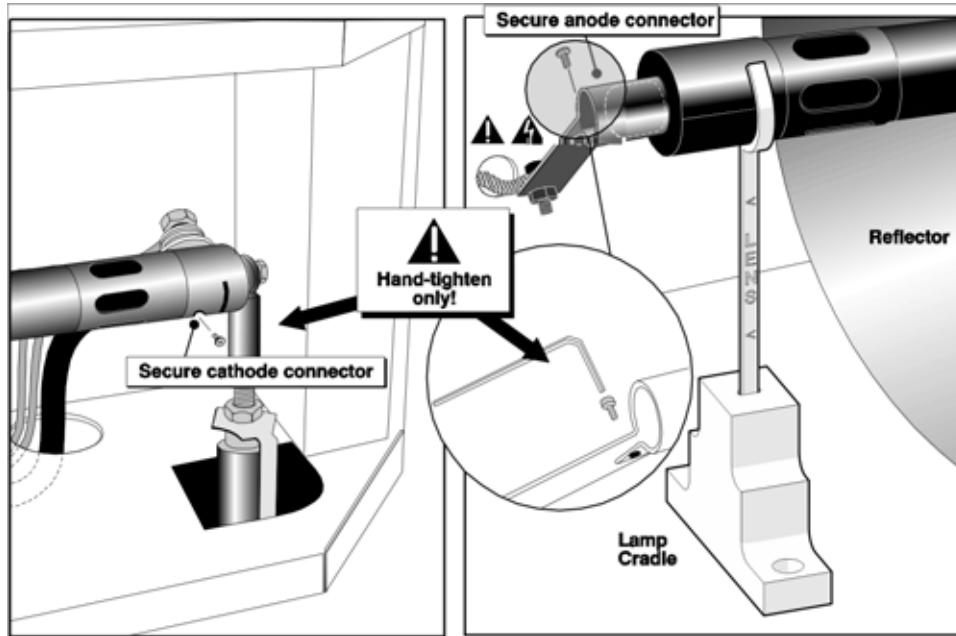


**Figure 8-1** Installing the Bulb

- b. Rest the anode (+) end of the lamp on the lamp cradle and slip the positive lamp connector over the bulb end. *Figure 8-1*



- c. Tighten the setscrews in the negative and positive lamp connectors. *Figure 8-2*



**Figure 8-2 Secure Bulb at Cathode (-) and Anode (+) Connectors**

**IMPORTANT!** Proper electrical contact prevents resistance in the lamp connectors. If you accidentally touch the quartz body of the lamp with your bare hands, clean the surface as described in [4.3, Maintenance and Cleaning](#).

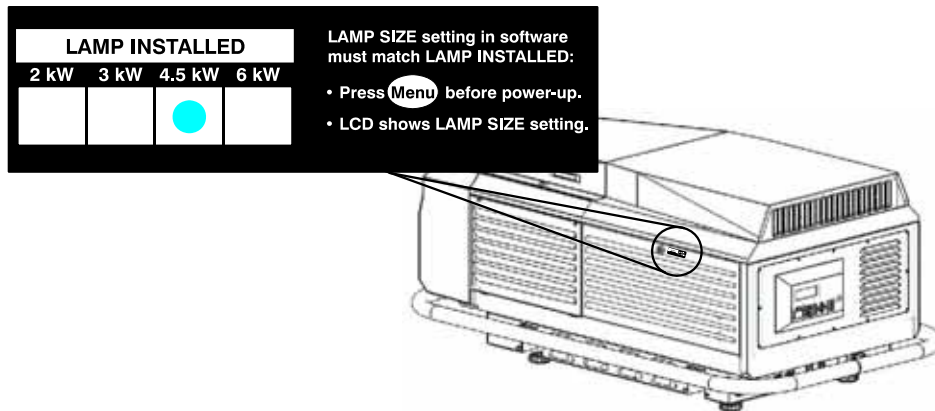
10. Make sure that the anode (+) lead between the lamp and the Igniter is well away from any projector metal, such as the reflector or firewall.

**⚠ WARNING** Leads too close to metal parts will cause arcing during starting pulse. This is a Safety Hazard, and the lamp may not ignite.

11. Re-install the cooling compartment door and close the lamp compartment door.

**NOTE:** The projector will not operate unless the louvered lamp compartment door is locked shut.

12. With a blue dot label or dry-erase pen, mark the lamp door's **LAMP INSTALLED** label to indicate the size of the newly installed lamp - 2.0, 3.0, 4.5, or 6.0 kW.



**Figure 8-3 Mark the Lamp Installed Label (EXAMPLE)**

13. Re-connect the projection head and the lamp ballast to AC power and then turn the breaker/power switch on.
  14. Set the lamp type:  
**NOTE:** *Not required if your new lamp is the same Lamp Size (in kilowatts) as the previous lamp.*
- ⚠ WARNING** Do not attempt to ignite the lamp until its size (kW) is correctly defined in projector memory.
- a. Press MENU.
  - b. Use the keypad or remote to enter the lamp password.
  - c. Use the up and down arrows to select a lamp size.
15. Press POWER on the keypad or remote to turn the projector on and ignite the lamp. Wait a minimum of 10 minutes for the projector and lamp to warm up.
  16. Open the **Lamp** menu, select **LampLOC™** and then **Do Auto**. See [Section 6.7.10 LampLOC](#).
  17. Record the serial number of the new lamp:
    - a. In the **Lamp** menu, select **Change Lamp**.
    - b. Enter the serial number in the **Lamp S/N** field.
    - c. Press ENTER to record the number and to reset the lamp timer.

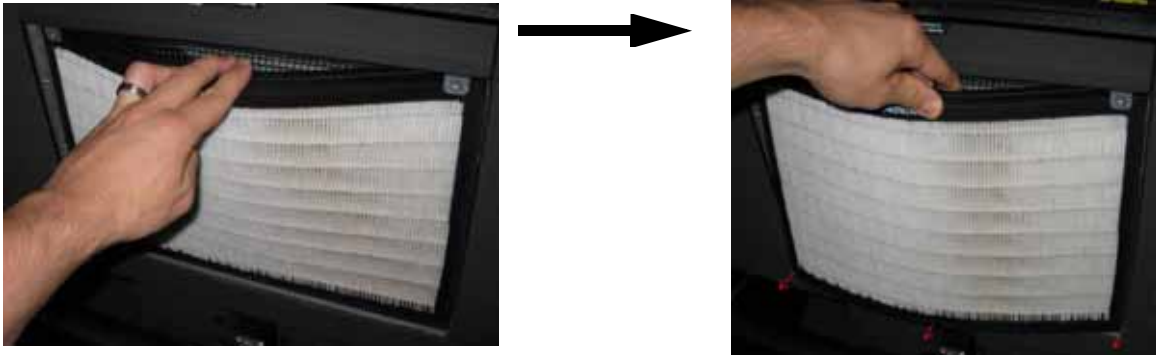
## 8.7 Replacing the Air Filter

You should check the condition of the light engine air filter monthly. Replace the light engine air filter when you replace the lamp module or sooner if you are operating the projector in a dusty or dirty environment. The filter is located on the lamp side of the projection head, near the front.

1. Press and hold the POWER button to turn the projector off.
2. Disconnect the projector from AC power.
3. Allow the lamp to cool a minimum of 10 minutes.
4. Turn the lamp ballast breaker/power switch off.
5. To open and remove the filter compartment door, loosen the 2 corner screws with a flat screwdriver, and then lift the door off.



- Use your fingers to pull out and remove the air filter.



**⚠ WARNING** Only use Christie filters. Never operate the projector without the filter installed.

- Place the top of the new air filter inside the air filter compartment and slide it all the way up behind the tabs, and then push the bottom of the air filter in.



- With the filter in place, insert the bottom tabs of the filter door into the corresponding slots, close the filter door, and secure the 2 corner screws with a flat screwdriver.

## 8.8 Replacing a Lens

To replace a lens:

- Unclip the lens safety tether from the projector handle or the FredFrame™.
- Rotate the lens clamp to the OPEN position.
- Pull out the lens and replace it. See [Section 2.5 Install the Lens](#).



## 9 Troubleshooting

This section provides information and procedures for resolving common projector issues. If you cannot resolve a projector issue, contact a Christie accredited service technician.

### 9.1 Projector Does Not Turn On

Check for the following:

- For China models, ensure the projector breaker, main ballast breaker and the lamp breaker are all in the ON position.
- Ensure the display backlight and the LEDs on the built-in keypad are functioning, and if the menu displays. If the built-in keypad is not functioning, it may need to be replaced.

### 9.2 Lamp Does Not Ignite

- Check for interlock failures. On the **Status** menu, select **Alarms and Interlocks**.
- If the **Status** menu indicates a ballast communication problem, restart the projector and ignite the lamp.
- If the temperature of a digital micromirror device (DMD) is too high, the lamp will not ignite. Cool the projector and try igniting the lamp again. Ensure there is proper ventilation and there is adequate airflow through the exhaust.
- If the lamp does not ignite after the second attempt, replace the lamp.
- Listen for a clicking noise that indicates the ballast is attempting to strike the lamp. If you do not hear a clicking noise, there might be a problem a problem with the ballast. Contact a Christie accredited service technician to resolve the issue.
- If you hear a brief clicking noise, but the lamp does not ignite, replace the lamp.

### 9.3 Lamp Suddenly Turns Off

- Older lamps may not reliably operate at significantly lower than rated power. Open the **Lamp** menu and increase the lamp power.
- The temperature of a digital micromirror device (DMD) is too high. Check for an alarm condition.
- Check for interlock failures. On the **Status** menu, select **Alarms and Interlocks**.
- Replace the lamp.

### 9.4 Flicker, Shadows, Or Dimness

- Ensure the shutter is open.
- LampLOC™ may need re-adjustment.
- LampLOC™ may be in the middle of its adjustment. Wait approximately 2-3 minutes.
- Open the **Lamp** menu and adjust the LampLOC™ motors manually. Select a full white test pattern and confirm all stepper motors are operational by watching on screen with while you adjust the motors.
- Increase lamp power. Lamps which are near end of service may not operate reliably at a lower power setting.
- Fold mirror misalignment. Contact your Christie accredited service technician to resolve the issue.

## 9.5 LampLOC™ Not Working

- If the **Do Auto** option is not working, open the **Manual Adjust** menu and adjust the lamp position manually. Observe screen brightness by adjusting the XYZ values or use a light meter to check for changes in brightness.
- Always adjust XY values before adjusting Z values. Repeat XY adjustments any time Z is adjusted. If brightness levels are not changing when adjusting the XYZ motors, one of the motors is damaged, the stepper driver board has malfunctioned, or there is a faulty connection.

## 9.6 LiteLOC™ Not Working

- Open the **Lamp** menu and verify LiteLOC™ is enabled.
- If the lamp power is at its maximum setting to maintain a LiteLOC™ setting, LiteLOC™ is automatically disabled. Reduce the LiteLOC™ setting, or install a new lamp.

## 9.7 Projector Keypad Not Illuminated when the Projector is On

- Unlock the lamp compartment door and confirm the harness is plugged into the back of the projector keypad.
- Touch any key on the projector keypad.

## 9.8 Blank Screen, No Image

- Confirm the projector, lamp ballast, and input device are connected to AC power.
- Confirm the lens cap has been removed from the lens.
- Press **SHUTTER OPEN** to open the shutter.
- Confirm a full black test pattern is displayed.
- Check the connections between the input device and the projector.

## 9.9 Severe Motion Artifacts

Verify if there is a synchronization problem with reversed 3-2 pull-down in the 60-24 Hz film-to-digital conversion and correct it at the source.

## 9.10 Image Appears Vertically Stretched or Squeezed into Center of Screen

To regain full image width and proper proportions you may need to install an anamorphic lens.

### **9.11 No Display when the Projector is On**

- Confirm the lens cap has been removed from the lens.
- Press **SHUTTER OPEN** to open the shutter.
- Press **LAMP ON** to ignite the lamp.
- Confirm the projector, lamp ballast, and input device are connected to AC power
- Check the connections between the input device and the projector.

### **9.12 The Display is Jittery or Unstable**

- Verify that the input device is connected properly. If the input device is not connected properly, the projector repeatedly attempts to display an image.
- The horizontal or vertical scan frequency of the input signal may be out of range for the projector.
- The sync signal may be inadequate. Correct the source problem.

### **9.13 The Display is Faint**

- The source may be double terminated. Ensure the source is terminated only once.
- If the input is not a video source, use a different sync tip clamp location.

### **9.14 The Upper Portion of the Display is Waving, Tearing, or Jittering**

This can occur with video or VCR sources. Check your source.

### **9.15 Portions of the Display are Missing or Warped to the Opposite edge**

Resize the image until the entire image is visible and centered.

Display Appears Compressed (Vertically Stretched)

- The frequency of the pixel sampling clock is incorrect for the current source.
- Sizing and positioning options may be adjusted poorly for the incoming source signal.
- Use an anamorphic lens for typical HDTV and anamorphic DVD sources that have been re-sized and vertically stretched, via 3rd-party software.

### **9.16 Data is Cropped from the Edges**

Reduce the image size to fill the display area, and then stretch the image vertically to fill the screen. Add an anamorphic lens to regain image width.

## 9.17 Intermittent Display Quality

- Verify the quality of the signal from the input source.
- Verify the H and V frequencies of the input source are correct.

## 9.18 Display Image Frozen

Turn off the projector and unplug the power cord from AC power. Plug the projector power cord into AC power and turn the projector on.

## 9.19 Inaccurate Display Colors

Adjust the color, tint, color space, and color temperature settings of your input source.

## 9.20 Display is Not Rectangular

- Verify the projector is level and the lens surface and screen are parallel to one another.
- Verify the keystone setting is correct.

## 9.21 Display is Noisy

- Adjust the input source pixel tracking, phase, and filter.
- Verify the video input is terminated ( $75 \Omega$ ). If the device is the last device in a linked series, verify the video input is terminated at the last input source.
- Verify the cables connecting the input device to the projector meet the minimum requirements.
- Add signal amplification or conditioning if the distance between the input device and the projector exceeds 25 feet.
- Reduce the detail setting if the source is a VCR or an off-air broadcast.



# Appendix A: Specifications

This section provides detailed Roadie HD+35K specifications. Due to continuing research, specifications are subject to change without notice.

## A.1 Display

### A.1.1 Panel Resolution and Refresh Rate

Pixel format (H x V) on 3 DMDs	2048 x 1080
Refresh rate, 2D displays	23.97 - 65 Hz
Refresh rate, frame-doubled 3D	23.97 - 96 Hz
Input-to-Image Delay	2 frames +30 lines (if locked to input) 3 frames (no timing restrictions)

### A.1.2 Achievable Brightness

Typical output using CDXL lamps:

- 32,500 ANSI lumens (35,000 Center lumens) – 6.0 kW Lamp
- 27,000 ANSI lumens (29,000 Center lumens) – 4.5 kW Lamp
- 18,000 ANSI lumens (19,500 Center lumens) – 3.0 kW Lamp
- 412,000 ANSI lumens (13,000 Center lumens) – 2.0 kW Lamp

### A.1.3 Achievable Contrast Ratio

With CDXL lamp and standard optical aperture installed:

- With standard high-brightness lens: 2000:1 full field
- With optional high-contrast lens: 2800:1 full field

### A.1.4 Colors and Gray Scale

Default color temperature	6500K +950K/-650K
Range of color temperature adjustment	3200K - 9300K
Displayable colors	1.1 billion
Gray scale resolution	10 bits each per RGB component

### A.1.5 Gamma

Adjustable from 1.8 to 2.8 (default =  $2.2 \pm 0.4$ )

## A.2 Lenses

**IMPORTANT!** Use the lens and screen size to calculate the precise throw distance using the tables provided in the Dealer Section of the Christie Web site, PN 020-100395-xx. Due to lens manufacturing tolerances for lens focal length, actual throw distance and vary  $\pm 5\%$  between lenses with the same nominal throw ratio.

## A.3 Inputs

Total number of standard inputs 6 (including Dual SD/HD-SDI).

**NOTE:** Not applicable with all models.

### A.3.1 Analog: RGB / YPbPr (5 BNCs at INPUT 1)

Scan format	Interlaced or Progressive
Signal types / color spaces	RGB YPbPr
Horizontal frequency range	15 – 120 kHz
Vertical frequency range *	23.97 – 150 Hz
Pixel clock rate	13 – 220 MHz min.
Active pixels per scan line (H)	640 – 2048
Active lines per field/ frame (V)	200 – 1536
A/D conversion resolution	10-bit
Input levels	
R,B,G,Y — with sync	1.0V <sub>p-p</sub> $\pm 2$ dB (0.79V <sub>p-p</sub> – 1.26V <sub>p-p</sub> )
R,G,B — without sync	0.7V <sub>p-p</sub> $\pm 2$ dB (0.56V <sub>p-p</sub> – 0.88V <sub>p-p</sub> )
Pb,Pr	0.7V <sub>p-p</sub> $\pm 2$ dB (0.56V <sub>p-p</sub> – 0.88V <sub>p-p</sub> )
DC offset	$\pm 5$ V
Nominal impedance	75W
Max. return loss (VSWR)	1.2:1 dB @ 200 MHz

\* Specifies frame rate for non-interlaced sources and field rate for interlaced sources. Input frequencies higher than the maximum panel refresh rate are displayed at a lower rate.

**A.3.2 Analog: Video (INPUTS 3 and 4)**

Signal formats	Composite (CVBS), S-Video (Y/C)
Connectors	
• Composite Video (INPUT 3)	BNC
• S-Video (INPUT 4)	4-pin miniature DIN
Video standards	NTSC, NTSC 4.43, PAL, PAL-M, PAL-N, PAL-60 and SECAM
A/D conversion resolution	8-bit
Input levels	
Composite	1.0 V <sub>p-p</sub> ± 3 dB (including sync tip)
S-Video, Luma (Y)	1.0 V <sub>p-p</sub> ± 3 dB (including sync tip)
S-Video, Chroma (C)	630 mV <sub>p-p</sub> nominal (burst)
DC offset	±2 V
Nominal impedance	75 W
Maximum return loss (VSWR)	1.2:1 dB @ 6 MHz

**A.3.3 Analog: Sync (Interlaced or Progressive Scan Format)**

Input levels (for composite or separate H and V)	0.5 V <sub>p-p</sub> – 4.0 V <sub>p-p</sub>
Impedance (for composite or separate H and V)	75 W
Sync type (for composite or separate H and V)	Separate H and V Bi-level or tri-level sync-on-green Bi-level or tri-level composite Serrations and/or Equalization pulses MacroVision for standard and progressive video
Polarity (for composite or separate H and V)	Positive or negative
Maximum return loss (VSWR)	1.2:1 dB @ 200 MHz

**A.3.4 DVI-I (INPUT 2)**

Interface standard	DDWG DVI 1.0
Signal types / color spaces	RGB (digital or analog) YPbPr (analog) YCbCr (digital) not supported in v1.1 s/w
Pixel clock rate	25 – 165 MHz
Analog sync input impedance	1 k
Maximum cable length	5 meters (16 ft.)
Supports EDID and HDCP	

For all other DVI specifications, see [A.3.1 Analog: RGB / YPbPr \(5 BNCs at INPUT 1\)](#).

### A.3.5 Dual SD/HD-SDI (INPUT 5 or 6, Standard with Projector)

Number of inputs	2, each with active loop-through
Connector type	BNCs, 75 W
Supported interface standards	SMPTE 259M (13.5 MHz clock modes only) SMPTE 292M and 372M (dual link)
Signal types / color spaces	Serial digital YCbCr (4:2:2 only)
Pixel clock rates supported	13.5 MHz, 74.25 MHz, 74.25/1.001 MHz

## A.4 Control

### A.4.1 Wired Remote

2 inputs on projection head	<ul style="list-style-type: none"> <li>• 3-pin XLR connector (rear)</li> <li>• 3.5mm phono jack (side)</li> </ul>
Input levels	<ul style="list-style-type: none"> <li>• High = 2.2 V – 5.6 V (or open)</li> <li>• Low = -0.6 V – 0.9 V @ 1 mA</li> </ul>
Voltage output	+5 VDC $\pm$ 5%
Current output	100 mA nominal, 250 mA max.
Cable length	25 ft.

### A.4.2 Remote Control

Number of IR sensors on projector	2 (front and rear)
Wavelength of peak sensitivity	1000 nm (approx.)
Modulation (carrier) frequency	38 kHz (nominal)
Encoding method	bi-phase
Range	100 ft. 50 ft. min.

Assumes no fluorescent lighting interference.

If range appears limited, shield the IR sensor, turn off lights, or change your fluorescent ballast.

### A.4.3 Ethernet

Number of ports	1
Standard	100Base-TX
Connector type	RJ-45
Max. baud rate	115200

**A.4.4 RS-232 Serial Input**

Number of connectors	2
Connector type	9-pin subminiature D (female=in, male=out)
Max. baud rate	115200

**A.4.5 RS-422 Serial Input**

Number of connectors	2
Connector type (side input panel)	1 x 9-pin subminiature D
Connector type (rear connector panel)	1 x 6-pin XLR
Max. baud rate	115200

**A.4.6 GPIO Input**

Number of I/O lines	7, each assignable as input or output
Connector type	9-pin subminiature D (male)
Type of connection	Dry contact
Output sink current (logic low)	100 mA @ 1V
Maximum power output	+12 VDC @ 200 mA

**NOTE:** Shared with 9-pin RS422 port.

**A.4.7 Control Port (From Ballast)**

Number of connectors	1
Interface	RS232
Connector type	9-pin subminiature D (male)

**A.4.8 Ballast Ports**

Number of connectors	1
Interface	+5 V TTL-compatible NOTE: Opto-isolated at ballast end.
Connector type	9-pin subminiature D (female)
Number and type of outputs	1 – lamp enable (low = enable lamp) 4 – safety interlocks (high = disable lamp) 1 – +5VDC for opto-isolated interface

## A.5 Power

### A.5.1 Projection head

#### Projection Compartment AC (near Panel B, at front)

Connector type and rating	(1) IEC 320-compatible, 10 A rating
Voltage range, nominal	200 – 240 VAC ±10%
Line frequency, nominal	50 – 60 Hz
AC input rating	10 A
Breaker/Power Switch	10 A
Max. inrush current	35 A
Max. current consumption	3 A
Max. power consumption	700 W

#### Lamp (DC)

Max. operating voltage	46 VDC
Max. start-up voltage	155 VDC
Max. current consumption	180 A
Max. power consumption	6600 W
Connector type	Female CAM Lock receptacle (+red) Male CAM Lock receptacle (–black)

### A.5.2 7 kW 3-Phase Ballast (38-814001-51)

Input Ratings	200-230 V 3~ +PE, 24 A, 50-60 Hz 380-415 V 3~ +PE, 16 A, 50-60 Hz
Inrush current (max.)	<50 A
<b>NOTE:</b> <i>excluding lamp</i>	
Power consumption (max.)	14.4 kVA (9.1 kW), all regions
Current rating (continuous) of 3-phase AC input at breaker/power switch	30 A, all regions
Breaker/power switch rating	50 A
China Breaker/power switch rating	40 A
<b>Ballast Output to Projection Head</b>	
Operating voltage range	18-46 VDC
Start-up voltage (open current)	125-155 VDC
Operating current range	50-180 A
Ripple	1% max @ 25°C
Control ports	See <a href="#">A.4.7 Control Port (From Ballast)</a> and <a href="#">A.4.8 Ballast Ports</a> .

## A.6 Lamps

Replace before times:

BALLAST	CXL/CDXL LAMPS (KW)	LAMP LIFE (HRS.)
<b>3-Phase 7 kW</b>	CXL/CDXL-20 (2.0)	3000
	CXL/CDXL-30 (3.0)	2000
	CXL/CDXL-45 (4.5)	600
	CXL/CDXL-60 (6.0)	600

**NOTES:** 1) Current range shown includes “over-drive”, which is 10% more than the original lamp rating.  
 2) Optimized brightness requires CDXL lamp.

TYPE	XENOLITE®
Stand-by lamp power level for 4.5/6.0	60% of lamp’s maximum current rating
Stand-by lamp power level 2.0/3.0	75% of lamp’s maximum current rating
Motorized adjustment of position	3-axis, 0.25-inch range for each

## A.7 Reflectors

10,000 hours

## A.8 Audible Noise

67.2 dBA maximum

## A.9 Safety

- CAN/CSA C22.2 No. 60950-1-07, 2<sup>nd</sup> Edition
- UL 60950-1, 2<sup>nd</sup> Edition
- IEC 60950-1, 2<sup>nd</sup> Edition (2005)

## A.10 EMC Emissions

- FCC CFR47, Part 15, Subpart B, Class A – Unintentional Radiators
- CISPR 22: EN55022: Class A – Radio disturbance characteristics for Information Technology Equipment (ITE)

## A.11 EMC Immunity

CISPR 24/ EN55024: All parts for immunity characteristics for Information Technology Equipment (ITE)

## A.12 Operating Environment

Temperature	10 to 35°C (50 to 95°F)
Humidity (non-condensing)	20 to 80%
Altitude	0 – 3000 meters
Tilt, any angle	15 degrees max.

### A.12.1 Non-Operating Environment

Temperature	-25 to 65°C (-13 to 149°F)
Humidity (non-condensing)	0 to 95%

### A.12.2 Weight and Size

**NOTES: 1)** Only applies to the product dimensions, but not to the product weight (since the installed weight of the product includes the heaviest lens, and all accessories). **2)** Excludes lens and cabling. **3)** All weights and dimensions subject-to-change.

#### Standard Dimensions (See [Appendix A: Specifications](#))

Product dimensions (W x L x H) without lens (including feet at minimum height position) and without handles	1257 mm x 684 mm x 577 mm 49.5-inch x 26.5-inch x 22.7-inch
Product dimensions (W x L x H) without lens (including feet at minimum height position) and handles	1362 mm x 800 mm x 577 mm 53.6-inch x 31.5-inch x 22.7-inch
Packaging dimensions (W x L x H), shipped without lens attached	1650 mm x 1040 mm x 890 mm 65-inch x 41-inch x 35-inch

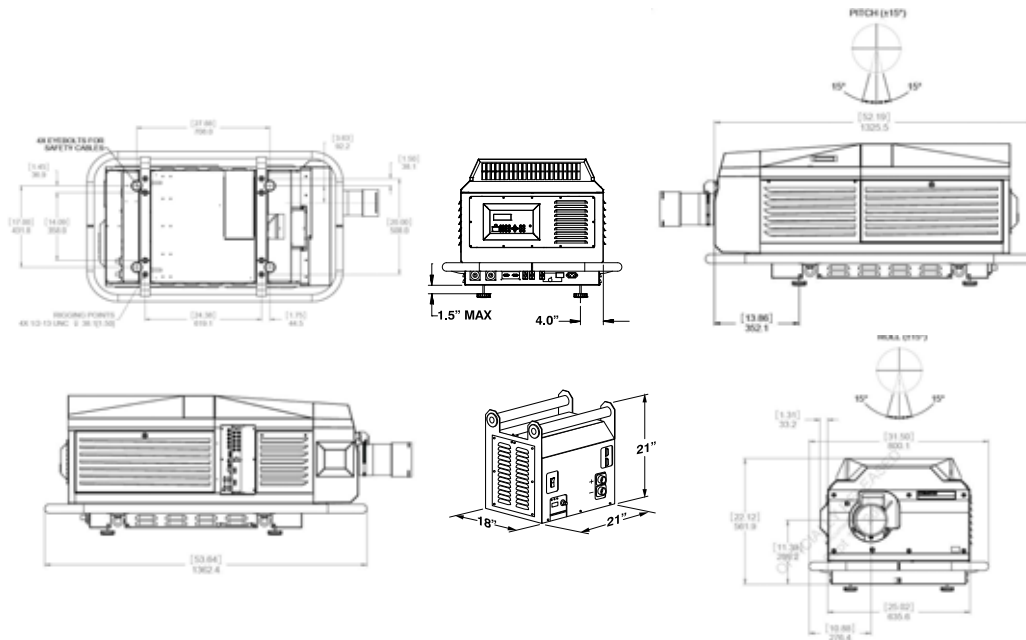
#### Shipping Weights

Projection Head	208.6 kg (460 lb)
Ballast	66 kg (145 lb)
FredFrame™	76 kg (166 lb)

#### Installed Weight

Projection Head	209.1 kg (460 lb)
Ballast	50 kg (110 lb)
FredFrame™	50 kg (110 lb)





**Figure A-1 Projector Dimensions**

## **A.13 Standard and Optional Components**

### **A.13.1 Standard (Sold with Product)**

- Projection head with remote (batteries included)
- 25 ft cable for conversion of remote to wired operation
- Power Cord, 10-foot (15 amp, 220V- North America)
- Face shield (required for lamp handling)
- Dual SD/HD-SDI input module (38-804656-XX)
- Roadie HD+35K User Manual
- Misc. hardware, including Allen Keys and security keys

## A.13.2 Optional (Sold Separately)

### Projection Lenses

The projection head is compatible with the following optional lenses:

0.8:1 fixed throw ratio lens	113-104106-XX
1:1 fixed throw ratio lens	38-809071-XX
1.25 – 1.45:1 Zoom	38-809073-XX
1.45 – 1.8:1 Zoom	38-809074-XX
1.8 – 2.4:1 Zoom	38-809075-XX
2.2 – 3.0:1 Zoom	38-809076-XX
3.0 – 4.3:1 Zoom	38-809077-XX
4.3 – 6.0 :1 Zoom	38-809072-XX
5.5 – 8.5 :1 Zoom	38-809078-XX
Motorized Auxiliary Lens Mount	38-813019-XX
1.26x Anamorphic Lens	38-809054-XX

### Lamp Ballasts

Remote Lamp ballast (7 kW)	38-814001-XX
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### Ballast (Remote) Cable Kits

2 meters (6½ ft.)	38-814003-XX
7.5 meters (25 ft.)	38-814004-XX
15 meters (50 ft.)	38-814005-XX
30 meters (100 ft.)	38-814006-XX

### Other

Remote Infrared Sensor - communication cables	Ethernet, RS-232, and RS-422
Remote Control	03-900566-XX
Christie TWIST Module for arbitrary image warping and edge blending	108-103001-XX
Fred Frame™ Rigging Frame	38-814007-XX
Rigging Clamps for flying projection head by handles	113-102101-XX
10-Bit KoRE Librarian Setup Software	Web site download (password required)
High-contrast internal aperture kit	38-813028-XX
Analog and Digital Input Modules	See <a href="#">Section 3.18 Adding Input Cards</a>
Xenon Lamp	2 kW, 3 kW, 4.5 kW, and 6 kW
Service Manual	020-100341-XX



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