



**Paladin Lens**



**Phoenix Lens**



## **LENS INSTALLATION GUIDE**

The Paladin and Phoenix lens systems represent the latest generation in patented anamorphic optical solutions to engage the anamorphic modes available in all popular home theater projectors for a dramatic increase in the clarity, detail and brightness of UltraWide movies. For general information about how these anamorphic lenses work, please refer to the Lens Options section of [www.panamorph.com](http://www.panamorph.com).

### **GENERAL GUIDELINES**

**Projector location.** Panamorph lenses are designed to be used upright (supported by the lens bracket) when a projector is vertically positioned at or below the center of the projection screen, OR, used inverted (hanging from the lens bracket) when a projector is vertically positioned at or above the center of the screen. The projector should be horizontally positioned at the center of the screen with little or no horizontal lens shift.

**Projector distance to screen and maximum screen size.** Please check with the Panamorph Screen Calculator at [www.panamorph.com](http://www.panamorph.com) to make sure your projection system falls within lens usage optimum parameters. UltraWide throw ratios (throw distance divided by UltraWide screen width) smaller than the recommended ratio of 1.6:1 will cause increasingly greater distortion and, with the Phoenix, may cause edge color fringing beyond the capability of convergence correction in most projectors. Throw

distances increasingly outside the recommended range will gradually make the image more difficult to focus. Generally, **a higher UltraWide throw ratio provides lower edge distortion and color misconvergence.**

**Screen aspect ratio.** The width-to-height ratio (ie aspect ratio) of the screen should be 2.4:1. A screen aspect ratio of 2.35:1 will still properly frame most movies but with a slightly greater amount of image projected onto the border. A deep black, absorbing screen border of at least 1.5" (40mm) should be used to compensate for edge distortions and variations in actual movie aspect ratios.

**Electronic Convergence Correction.** The Phoenix lens is designed to use Electronic Convergence Correction (ECC) currently provided in home theater projectors from Epson, JVC and Sony. Without ECC the image will show increasing color fringing toward the sides of the image. However, if the UltraWide throw ratio is above 2.0:1 then this fringing is very difficult to see in actual content.

**Anamorphic Lens Modes.** The increased performance offered by Panamorph lenses requires Anamorphic Lens Modes (ALM) from your projector or some other device. Panamorph has worked with every popular home theater projector manufacturer to include these modes. However, **please check with your projector user manual to confirm these modes and how to access them using your projector's remote control.** While the projector modes may have different names, Mode 1 or "UltraWide" provides a vertical stretch of an image by 33% while Mode 2 or "TV" provides a horizontal squeeze of an image by 25%. See the Panamorph Demo Theater simulator at [www.panamorph.com](http://www.panamorph.com) to get a visual feel for how these modes work.

After the Panamorph lens is installed you can use your projector remote to engage the projector's two anamorphic modes or to turn them off to provide the following options.

CONTENT	MODE	RESULT
UltraWide movies	UltraWide	Content completely fills the UltraWide screen. 100% projector performance used.
Made-for-HDTV content and movies with a 1.85:1 aspect ratio.  <b>See the Panamorph Demo Theater at <a href="http://www.panamorph.com">www.panamorph.com</a> for interactive demonstrations of these modes.</b>	UltraWide	Content completely fills the UltraWide Screen but 12.5% is cut off from both top and bottom of non-Ultrawide content. 100% projector performance used.
	TV	Content is projected onto the horizontal center of the screen with black "pillars" on the left and right. 1.85:1 movies may have black sliver at top and bottom. 75% projector performance used.
	OFF or Stretch	Content fills the UltraWide screen with nothing cut off but image appears horizontally stretched. 1.85:1 movies may have black sliver at top and bottom. 96%-100% of projector performance used.

## BEFORE LENS INSTALLATION

1. **Install the Attachment Kit.** This is the XM2, XMU or XMU-S Attachment Plate with hardware and instructions that are typically packaged with your Panamorph lens system.
2. **Make mechanical adjustments to your projection system** so that a 16:9 test image is horizontally centered on your UltraWide projection screen using little or no horizontal lens shift or keystone adjustment and so the top and bottom edges of the image are parallel with the top and bottom edges of the screen.

Before installing a **Paladin Lens**, adjust the projector zoom so you can see the **left and right edges** of the 16:9 test image on the screen slightly inside the screen border. Adjust the vertical image height to provide the same amount of image spill above and below the screen. Adjust any available convergence controls on the projector to make sure there is no color fringing visible when projecting fine white lines.

Before installing a **Phoenix Lens**, adjust the projector zoom (with added vertical lens shift as needed) so you can see the **top and bottom edges** of the 16:9 test image on the screen slightly inside the screen border.

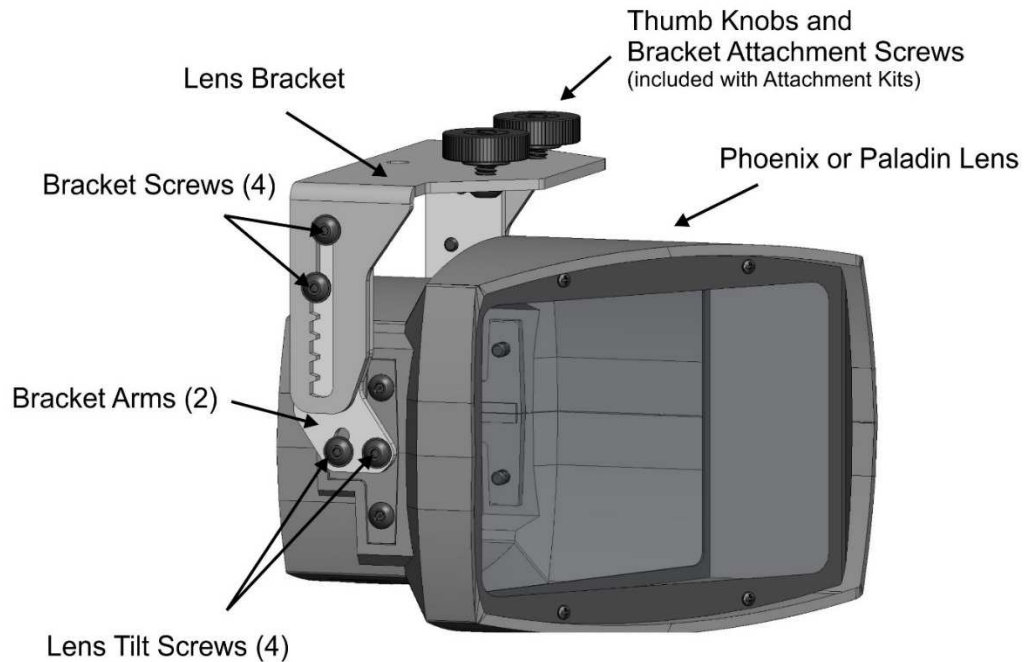
## INSTALLING THE PALADIN OR PHOENIX LENS

1. Locate and remove (if not already removed) the Lens Bracket from the Lens by removing the four Bracket Screws (see following illustration), leaving the Bracket Arms attached to the Lens. Please leave the protective film on the lens for now. Contact Panamorph for instructions for optionally mounting the lens upright onto to a high shelf.

***IF USING THE AUTOMATED TRANSPORT, SKIP STEPS 2 AND 4 BELOW AND REFER TO THE AUTOMATED TRANSPORT INSTALLATION GUIDE BEFORE RETURNING TO STEP 5.***

2. From the Attachment Kit, insert the two 3/4" Bracket Attachment Screws up through the Lens Bracket and tighten using the included Hex Key.

OPTIONAL FOR LARGER PROJECTORS: Instead of the 3/4" screws, use the larger Bracket Attachment Screws with the Bracket Attachment Spacers if you determine or desire that the Lens should vertically extend farther from the Attachment Plate to properly position it in the projector beam. You may wish to preview step 5 below to get a feel for this vertical positioning.



3. Attach the Lens to the Lens Bracket by inserting the four #8-32 Bracket Screws (two on each side) through the Lens Bracket height-adjustment ratchet slots and into the Bracket Arms.
4. Refer to instruction illustrations for your particular Attachment Kit. Attach the Lens Bracket (now with Lens attached) to the Attachment Plate by directing the Bracket Attachment Screws (now in the Lens Bracket) up through the slotted holes (XM2) or the horizontal slot (XMU/XMU-S) and secure using the two Thumb Knobs. NOTE: If the longer 1 5/8" Bracket Attachment Screws are used then the 1" Bracket Attachment Spacer should be between the Lens Bracket and the Attachment Plate. If using the XMU or XMU-S Plate, loosen the Thumb Knobs and slide the Lens Bracket horizontally in the slot to center the Lens in front of the projector lens before retightening the Thumb Knobs.
5. Remove the protective film from the Lens. Turn on the projector and project a full test image preferably with fine, white horizontal and vertical lines and observe the beam passing through the Lens. Height adjustments are made by slightly loosening the two Bracket Screws on each side and then tilting and vertically moving the Bracket Arms attached to the Lens to an appropriate notch in the ratchet slots where the Bracket Arms can settle to align with the sides of the Lens Bracket. Tilt adjustments are made by slightly loosening the two Lens Tilt screws on each side connecting the Bracket Arms to the Lens so that it pivots about the front screw. With these operations in mind:

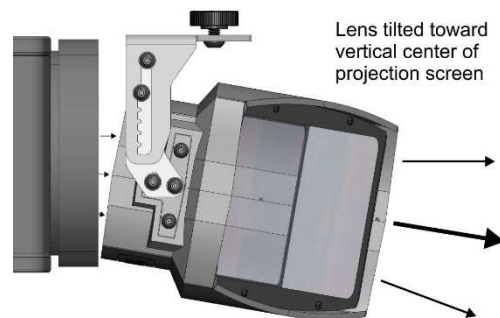
## PALADIN LENS ADJUSTMENTS

The following steps provide an optimum balance between Paladin Lens tilt and height combined with the projector vertical lens shift setting.

- a. Immediately after installing the lens a shift of the image up or down may be expected. Starting with zero tilt of the Paladin Lens, adjust the height so that the entire projector beam passes through.
- b. Play a movie with a known 2.4:1 aspect ratio rather than using the projector test pattern. Adjust the Paladin Lens tilt to adjust the vertical dimension of the image in combination with adjusting the projector vertical lens shift to vertically center the image on the screen. You may need to do these steps several times for the best adjustment. After these adjustments you may need to adjust the height of the Paladin Lens again to make sure the entire projector beam passes through.
- c. Slightly loosen the two Thumb Knobs and pivot the Lens Bracket about the vertical axis to make the right and left sides of the image appear symmetric. You may also need to add a washer or two between the Attachment Plate and the Lens Bracket to make sure the Lens Bracket is square with the screen.

## PHOENIX LENS ADJUSTMENTS

- a. Adjust both the height AND tilt so that the front of the Phoenix Lens is approximately facing the vertical center of the screen AND so the projector beam is approximately vertically centered at the Lens exit. Once this adjustment is made, tighten the Bracket Screws.



- b. Make a final adjustment to the Phoenix lens tilt so that there is a similar but opposite amount of curvature (this may be slight) at the top and bottom of the image then tighten the two Lens Tilt screws on both sides of the lens to lock in the tilt.
- c. Slightly loosen the two Thumb Knobs (or M6 screws if a transport is used) and pivot the Lens Bracket about the vertical axis to center the image on the screen and to make the image appear symmetric. You may also need to add a washer

or two between the Attachment Plate and the Lens Bracket to accomplish this symmetry if the Lens Bracket is not completely square with the screen.

6. Adjust the projector zoom to fill the width of the screen, slightly overlapping the left and right screen border so that no gaps exist. Adjust the projector vertical lens shift one last time to center the image vertically. You may need to make both adjustments together to remove any remaining gaps between the image and the screen. If later a movie is played and a slight gap is noticed between the movie and screen at the top and bottom then simply zoom up the image a bit more to fill the gap. This can occur especially if the screen has an aspect ratio of 2.35:1 instead of 2.4:1. If necessary, adjust the Lens height one more time to ensure that the entire projector beam passes through the Lens.
7. **If using the XM2 Attachment Plate**, loosen the Thumb Knobs one last time and move the Lens Bracket toward the projector to minimize the distance between the Lens and projector lens. This distance is not critical but minimization somewhat helps to minimize dust accumulation and stray light.

**If using the XMU or XMU-S Attachment Plate**, slightly loosen the RPA000 thumb nuts just enough so that the Attachment Plate can be slid back to minimize the distance between the Lens and projector lens. If using the Automated Transport then make sure the Lens can move horizontally without interference. Perform a final check to make sure the image adjustments have not changed then retighten the RPA000 thumb nuts and thumb nuts (or M6 screws if using the Automated Transport).

## **ELECTRONIC CONVERGE CORRECTION SET UP (PHOENIX)**

The Phoenix Lens can create color fringing which increases toward the right and left edges of the image when a projection system has a relatively small ratio of throw distance to screen width. If noticeable, this color fringing can be corrected by the Electronic Convergence Correction (ECC) feature currently available in Sony, Epson and JVC projectors, taking approximately 5 to 30 minutes to set up depending on the projector model and level of desired correction. Note that these adjustments are performed only once during lens setup and can be turned off and then back on to your settings through the projector menu.

ECC set up involves projecting a test grid of lines then individually adjusting the blue and red line image in all screen areas so they are each aligned with the green lines. Although ECC is required only in the horizontal direction for the Phoenix Lens, you may wish to remove any visible vertical color fringing due to misalignments in the projector itself at this time. Here are some brief notes to access the menu options for ECC:

**Epson: Menu -> Extended -> Panel Alignment.** See the user manual for more detailed discussion regarding “Adjusting the Color Convergence”. The first step of Epson’s ECC allows you to adjust the four image corners to impact the entire image. This very quickly implements ECC but you may still wish to continue with finer adjustments per the manual.

**JVC: Menu -> Installation -> Pixel Adjust.** Please refer to the “Zone Adjust Operation Procedure” in the user manual.

**Sony: Menu -> Installation -> Panel Alignment.** Please refer to the section on “Panel Alignment -> Zone” in the user manual.

## CLEANING

In most applications lenses do not benefit very much from cleaning – a bit of dust will not significantly impact image clarity. However, in today’s high performance home cinemas with very dark rooms a small build-up of dust or other foreign matter on your projector lens or your Panamorph lens can produce a noticeable reduction in contrast. The most effective cleaning approach is to simply blow off any dust. If there is any residue or build-up then it is recommended that you clean the optics with professional lens cleaning supplies such as from a camera store **while the lens is in front of the lit beam of the projector**. This will allow you to quickly see both the results of cleaning and also if you are causing any damage.

## LIMITED WARRANTY

Panamorph, Inc. warrants this product to be free of defects in original workmanship and material for a period of twenty-four months from the date of manufacture. During this period, a defective unit may be repaired or replaced, at the discretion of Panamorph, Inc., by returning it in its original packaging with a copy of your receipt. This warranty does not cover damage resultant from lack of prudent care, accident or misuse (including the use of motor systems with lenses or other products in ways not intended), or any cosmetic damage not reported within 15 days of purchase. Damages are limited to the cost of the product. A service charge may be applied to any returned product requiring cosmetic attention, or to the repair of any damage not covered under this warranty. For further information please contact [sales@panamorph.com](mailto:sales@panamorph.com).