FOV Cropping Guide

Pimax EVO FOV Cropping Guide

Achieving Native Image Quality Through FOV Cropping

Introduction

Pimax headsets render an extremely wide field of view to maximize immersion. However, depending on the application, a significant portion of those rendered pixels may never be visible. In sim racing, for example, much of the upper and lower image is naturally blocked by the driver's helmet or falls outside the area you typically focus on while driving.

Racing Category	Typical Vertical FOV	Eye Port Height	Primary Design Reason
Formula / Open-Cockpit	**~25°**	~60mm	Maximizes shell strength; protects against high-speed track debris.
GT / Touring / Sports Car	**30° – 35°**	~90mm	Wider window to read low dashboards and high rearview mirrors.
Karting	**35° – 40°**	~95mm	Lower speeds allow a larger opening for better close-range awareness.

Rather than lowering render resolution—which reduces image quality across the entire image—this guide explains how to reduce the rendered field of view while maintaining native pixel density within the visible area.

The end result is a smaller rendering workload with little to no visible loss in image quality, allowing higher graphics settings, improved frame rates, or additional headroom for demanding scenarios.

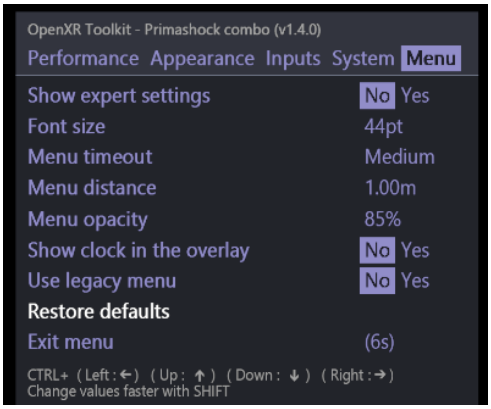
Although this guide was developed using a **Pimax Crystal Super Ultra-Wide**, the same workflow should apply to any headset supported by **Pimax Play/EVO**.

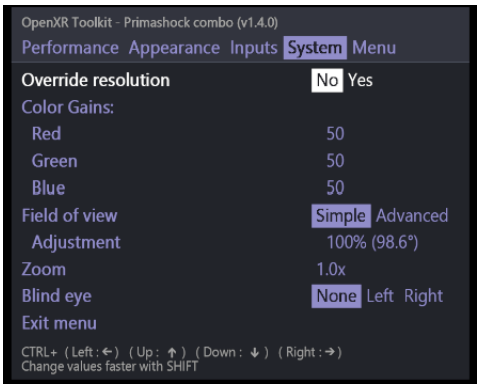
What You'll Need

Before starting, download and install the following:

- OpenXR Toolkit
  - GitHub - mbucchia/OpenXR-Toolkit: A collection of useful features to customize and improve existing OpenXR applications. · GitHub
- PrimaShock OpenXR Toolkit Mod
  - OpenXR ToolKit mod by primashock VR/ – primashock
- Pimax EVO
  - NLS Discord
- Sboys3
  - NLS Discord

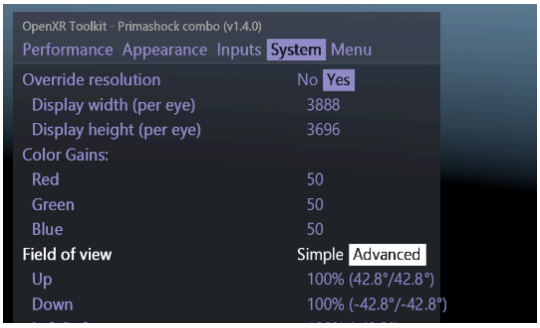
The overall workflow is straightforward:

1. Open **PrimaShock's Toolkit**. (Game Restart Needed)
   - Run the game and open the Toolkit Overlay (restore default values).
   - 

   - 

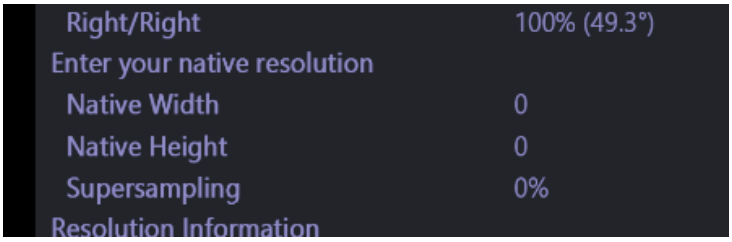
     Override Resolution - Yes

FOV - Advanced

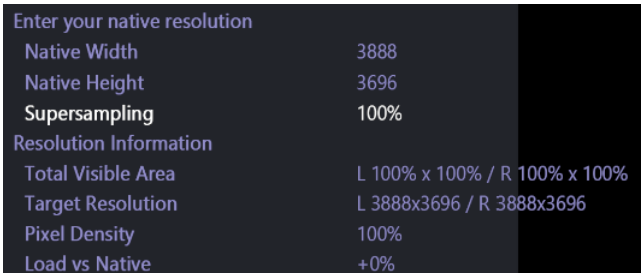


- Enter your Runtime Native Resolution using **100% Supersampling**.

  From:

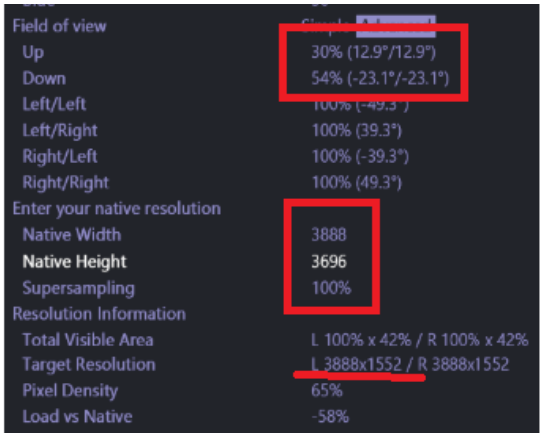


  To:



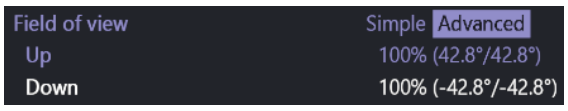
  - *At this point, the rendering canvas correctly matches your Runtime Native Resolution. This serves as the baseline before applying the crop.*

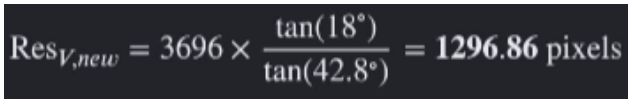
- Now lets put in the vFOV Angles

i. 

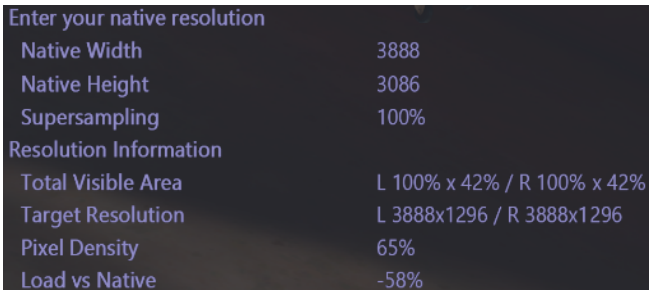
  - *Observe as you change the FOV angles how the Target Resolution changes. This is expected.Changing the crop alters the rendering canvas, causing the Target Resolution to differ from the native resolution.*

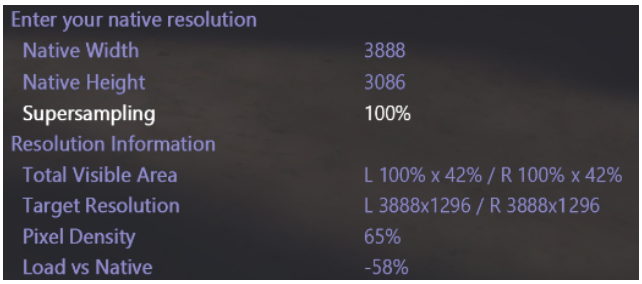
Note: Recommended Starting Point for Sim Racing:

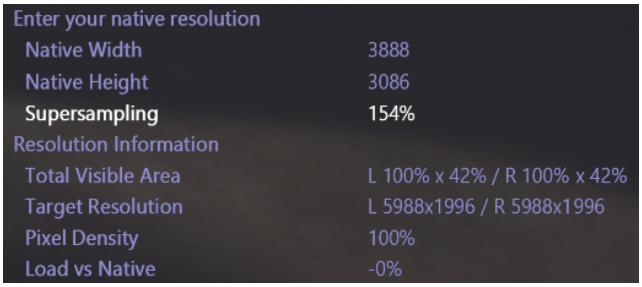
- Example:
  - 

  - Upper Crop: 12.9°/ Lower Crop: 23.1°
  - Total Vertical FOV: ≈36°
- A vertical field of view of approximately 36° closely replicates the restricted visibility of a racing helmet while significantly reducing the rendering workload.
  - $New\ Resolution\ =\ Native\ Height\ resolution\ x\ [tan(\theta/2)/tan\ (\beta/2)]$
    - Where:
      - θ/2 = Up angle value @100%) = **42.8**
      - β/2 = half of the desired vFOV = 36/2 = **18**
    - 

  - This will be unique to each Model of headset.

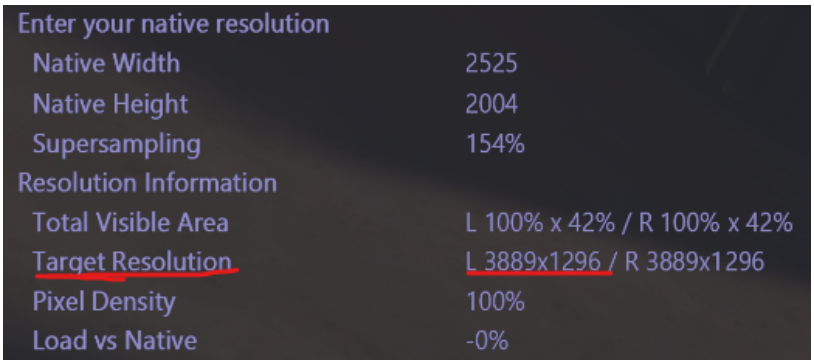
- Decrease Native height until Target resolution matches Preferred Choice for Height Resolution Target.(in my case 1296)
  i. 

- Next take a look at “Load Vs Native”,to target this, increase Super Sampling until Pixel density reaches 100% and Load vs Native goes to 0% difference.
  i. From:
  

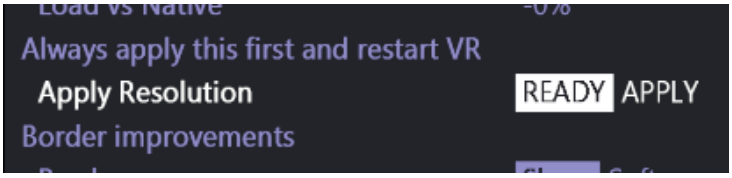
  ii. To:
  

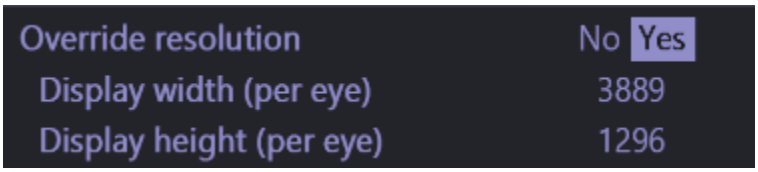
iii. Increasing supersampling changes the effective rendering canvas, causing the Target Resolution to change. This is expected and will be corrected in the next step.

- Now decrease Native Width and Height Values until Target once again matches the preferred Target resolution

i. 

- Apply Changes and your override resolution now should match your preferred Target Resolution

i. 

ii. 

- Restart the game. The configuration is now complete. Your rendering canvas, crop angles, and supersampling are now synchronized.
- Further super sampling can be achieved without redoing the canvas (vFOV(up.down)) adjusting what's left of the super sampling up to 200%. If your system can manage 200% after these settings, then vFOV target resolution and/or vFOV angle can be increased further.