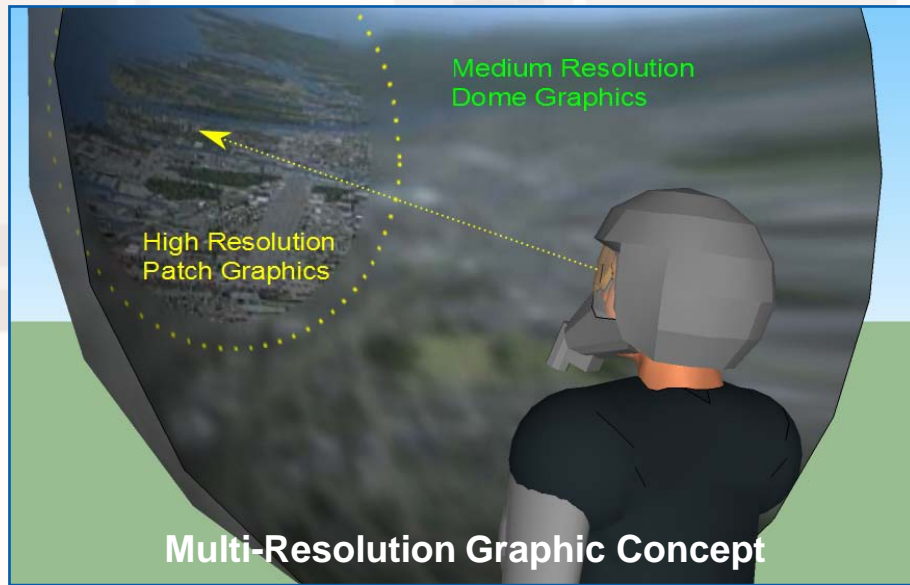




# High Resolution Head Mounted Display (HMD)



Multi-Resolution Graphic Concept

## Problem

It is not currently cost effective to display immersive environments in a manner that represents a real world scene viewed at very high resolution, so pilots train as if they have less than perfect eyesight.

## Solution

- Overlay a high-resolution small field-of-view patch over the top of a lower resolution dome display
- A low-resolution wide-field display: two projectors that together project to the entirety of the dome, with some overlap for blending
- A high-resolution patch display: two projectors that together form a square that is projected onto a pan-tilt mirror, which directs the image onto the dome in the direction of the user's head

## Expected Results

- A patch rig constructed using the macro-lens insertion into two standard COTS projectors with a beam splitter that effectively merges the two images, and then bounces that image off of a pan-tilt mirror that directs the image
- Dome projection that uses two more projectors reflected off two spherical first-surface mirrors to widen the projection area
- Embedded video manipulation software that performs the image warping to facilitate the patch image merge, dome image merge, and patch-dome insertion

## Expected Benefits

- A system that provides a virtual heads up display that creates high resolution imagery in the direction the user's head faces
- A system using four projectors instead of the dozens that would be required to otherwise cover the entire field of view
- Significant cost and space savings

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