

# **World's Largest Field of View Collimated Display**

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## **ABSTRACT**

As flight simulators increase in fidelity and performance, more training tasks can be transferred to the simulator, freeing up aircraft time for other tasks. For some training missions, there are tasks that can currently only be performed in the aircraft due to limitations in the simulator Field of View (FOV). In addition, a large horizontal FOV aides in the pilot's peripheral cues for aircraft attitude, speed and height above terrain, and the addition of lower chin and side displays are required for helicopter pilots to perform hover and landing tasks, especially in "brown out" conditions. Since Mylar displays are not typically able to extend beyond 65° vertically x 225° horizontal, the customer would have to add supplemental real image or collimated displays located outboard of the Mylar mirror plenum, resulting in a large discontinuity in the image. A better option is to use glass mirrors for the Out the Window collimated display, extending the primary display horizontal FOV by adding glass mirror segments as required. Supplemental chin and side displays can be tucked under the edge of the mirror to eliminate gaps between the displays. However, the use of glass mirrors on such a large FOV display has its own challenges, including manufacturing a single piece Back Projection Screen (BPS) to cover the full FOV, designing a projector turret that locates the array of projectors across the top of the BPS, and fitting the cockpit and Instructor Operating Station within the wedge-shaped gap left between the ends of the mirrors and/or BPS. This paper will focus on the unique challenges our team overcame to build the largest collimated system ever designed