ENHANCED CONTRAST COLLIMATED DISPLAYS

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ABSTRACT

Contrast is one of the most important attributes for a visual display to create a realistic visual scene and can affect other visual characteristics such as perceived resolution. In a collimated visual display, contrast is highly dependent on the field of view, both vertical and horizontal, the number of projectors, and the screen's gain and tint. To a lesser extent system contrast is affected by the projector technology (LCoS, DLP, etc), projector locations, the scene contrast, and the reflections occurring within the screen in a back projection screen system. Except for these interior reflections, contrast is relatively unaffected by whether the screen is front- or rear-projected, or whether the collimating mirror is glass or a Mylar film mirror. Many of these variables have been studied and their effect on contrast measured, but until recently a high contrast back projection screen has not been fielded on a customer system. This papers will summarize the factors affecting contrast and introduce the latest high contrast screen delivered on two recent United States Marine Corps UH-1Y Flight Training Device simulators, which resulted in a marked 30% increase in contrast over similar systems with standard back projection screens.

BIO

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Justin Knaplund is a Senior Staff Display Systems Engineer at FlightSafety Visual Systems in Austin, TX. Mr. Knaplund graduated from the U.S. Air Force Academy with a BS in Astronautical Engineering, served eight years in the US Air Force as a Pilot and Instructor Pilot in the F-4E Phantom before separating to pursue a Master's of Science in Aerospace Engineering from the University of Texas in Austin. After a period of employment with the Advanced Programs Office at the NASA Johnson Space Center in Houston, he was hired by Glass Mountain Optics of Austin, TX, and became the Director of Engineering, responsible for developing the designs for their WAC windows, cross-cockpit collimated Mylar and glass mirror displays, and their direct view (WASP) systems. Glass Mountain was acquired by FlightSafety International in 2009, and Mr. Knaplund now works as a Senior Staff Display Systems Engineer for FlightSafety Visual Systems in Austin, TX.