BAA 08-36
Urban Leader Tactical Response, Awareness & Visualization (ULTRA-Vis) Seedlings

Seedling 1:

Title: Visor Display System
Corporate Author: BAE SYSTEMS AVIONICS LTD ROCHESTER (UNITED KINGDOM) AIRPORT WORKS Report Date: April 01, 2006 Abstract (publicly releasable):

Traditionally, head mounted displays have used a conventional spherical lens system to generate a collimated display from an image source such as a cathode ray tube or liquid crystal display. These display assemblies are heavy and are usually fixed to a helmet to allow for the small system exit pupil (usually 10 to 15 mm diameter) that allows only a minimum relative motion between the eye and the helmet. This report describes the development of a revolutionary concept Visor Display System, which offers a lightweight, large exit pupil system. Two different practical approaches are described. The designs use total internal reflection, where light is constrained in a glass waveguide. Holographic structures have been developed and demonstrated which allow a small fraction of the light in the glass to be emitted directly out of the glass as the light propagates along the waveguide. This process is repeated in two dimensions to create a large pupil of light from a small input pupil. Two demonstrators have been built using different designs to give a 40 x 40 mm and a 96 x 96 mm exit pupil display. The smaller design has shown a route forward, when combined with improved efficiency holograms, to deliver the next generation of head mounted displays.

Seedling 2:

Title: Head Mounted Alerting for Urban Operations via Tactical Information Management System
Corporate Author: RAYTHEON CO MARLBOROUGH MA Report Date: March 01, 2006 Abstract (publicly releasable):

The United States military possesses unprecedented tactical alert generation capabilities but could quickly overwhelm a soldier conducting an urban operation with too much information. For this program, the authors investigated the use of a proof of concept Information Management Engine (IME) to allow a soldier to filter the information he receives, via a head mounted presentation system, through an intuitive training process. For the authors' purposes, the pieces of information that are sent to the soldier are referred to as 'alerts' and can be in the form of text, audio (speech), imagery, or streaming video. The objective is to provide a "peripheral awareness" capability that presents appropriate information via a head mounted see-around video display and an integrated earphone. Toward this end, the authors developed a prototype Tactical Alert Management System (TAMS) that uses the IME to determine if and how an alert should be presented to the user. The authors then developed a set of experiments to assess the military utility of the TAMS concept. Finally, the authors conducted an after action review and reported the results in this document.