ADPA/NSIA Abstract

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Concept: High Energy Toroidal Vortex for Overlapping Civilian Law Enforcement and Military Police Operations. The prototype toroidal vortex launcher was built on a Phase I SBIR sponsored by the USAF Phillips Lab. Dean Lawry is the Technical Monitor. The prototype is shown in Figure 1.

The High Energy Toroidal Vortex (HETV) is a non-lethal device whereby the targeted person is knocked down by an energetic toroid. Figure 2 is a frame of data from an August 1997 test series, showing a HETV in flight. Several missions are envisioned for this device including: hostage/barricade situations arising from terrorist and other criminal activities, rapid response to and resolution of violent outbreaks in jails and prisons, anti-terrorist response capabilities including the protection of critical and sensitive areas and facilities, response capability for riotous mobs and civil unrest as may be experienced at domestic or foreign location military bases and installations, and anti-gang and drug response capability.

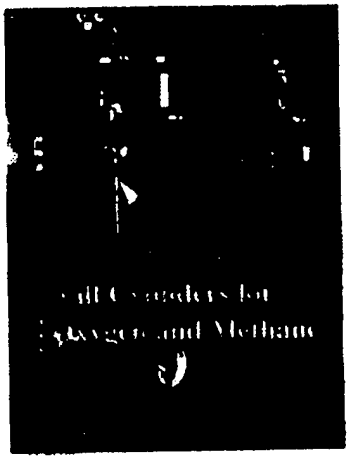

FIGURE 1. Integrated HETV setup for cold flow tests. Unistrut stand simplifies testing.

The HETV is capable of carrying a large amount of energy in the vortex structure. This energy is stored in the HETV by means of the forward kinetic energy, the core rotation kinetic energy and the rarefaction zone in the annular vortex core. Recent tests with the prototype indicate that the vortex is capable of 0.5 to 0.8 times the speed of sound with an energy of 500 joules or more.

The HETV currently operates on methane and oxygen. It is a simple tube with a combustion chamber on the back, two small fill tanks and a donut forming flat plate on the front. CFD analysis is proposed for the Phase II effort, to enhance the energy containment and repeatability of the device.

Conversations with the Los Angeles Sheriff Dept., Los Angeles Police Dept. and the National Law Enforcement Corrections Technology Center indicate a small hand held device would be of use in multiple tactical scenarios and that a mobile unit would be of greatest interest in prisons and jails.

Figure 2. Vortex generated during Camp Pendleton Testing. Blackbody calibrator and pressure transducers visible in the background.