DEFENSE TECHNOLOGY INTERNATIONAL

E-Bombs Could Go Mainstream

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By David Hambling

> "Damage assessment for all electromagnetic weapons, be they e-bombs or beam weapons, is problematic," Kopp says. "Unless the attack fries the power supply and you observe related electrical breakdown symptoms, you will never know whether you fried the target or the victim intentionally shut down. The expectation that such weapons should provide easy-to-observe bomb damage assessment mechanisms is not realistic."

The multifunction munition provides more signs of its effects than the traditional e-bomb, whose effects are invisible. It is possible to determine whether a target has been hit, and a target within the radius of blast and fragment damage will also have suffered EMP effects. But these are variable, depending on the angle between the target and the pulse, the nature of the electronic component and the amount of shielding. Effects range from temporary disruption and forced rebooting to permanent damage or electrical burnout of components similar to that of a lightning strike.

With their comparatively low power output, the Army's new small multifunction munitions are for point targets. Two candidate munitions for upgrade are the Tow missile and 2.75-in. rockets fired by helicopter. This is unlike previous e-bomb efforts, which have focused on large air-delivered bombs or unitary artillery munitions that cover a large area, what Kopp terms "weapons of electrical mass destruction."

A small e-bomb will be qualitatively different than larger versions. Radiated power falls off with the square of distance, so a target 3 meters (10 ft.) away receives 100 times the effect of one 30 meters away. An EMP-enhanced Tow missile would produce a pulse strong enough to destroy what it hits, but should not disrupt electronics over a wide area. The possibilities of electronic "friendly fire" rule out more powerful tactical e-bombs, but Kopp warns that even smaller versions may cause unpredictable collateral damage. If urban electrical power or telephone wiring picks up the pulse, damage could extend over a wide area.

The smallest weapon that the Army is looking to upgrade is the M77 bomblet fired by the Multiple Launch Rocket System (MLRS). A bomblet has a shaped-charge warhead and throws out antipersonnel fragments. Bomblets cover a wide area—one launcher can fire a 12-rocket salvo blanketing an area the size of six football fields—and are used against soft targets. An EMP-enhanced version would cover the same area, providing even destruction over the target zone.

If the M77 can be upgraded, shoulder-launched rockets and similar weapons could be modified to produce an EMP. Small infantry rockets have limited effectiveness against modern armor. An EMP-enhanced round might not penetrate but could provide a "soft kill" capability that immobilizes a vehicle. This damage is hard to repair and would probably require the replacement of electronic systems.

The U.S. Air Force has an interest in this area, but few details are available. Air-to-air missiles might gain considerably with EMP capabilities, if they could be modified without affecting performance. Antiradiation missiles that target air-defense radar would be

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another market.

The U.S. Naval Surface Warfare Center's Indian Head Div. wants to build a warhead that knocks out improvised explosive devices (IEDs) with a plasma fireball. The aim would be to produce a controlled explosion, destroying the IED without detonating it, and so minimizing collateral damage.

Tests in 2007 used explosively generated plasma against artillery and mortar rounds, which are often the basis for IEDs. Information about the project has been removed from the Indian Head web site and no details are being released. This suggests the work is at an advanced stage, possibly field-testing.

Multifunction warheads may finally bring e-bombs into the mainstream of armaments, by making a munition effective against all targets as well as electronic ones.

Photo: US Army

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