Data Testing Method for Output from an Electrical Primer

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- Electrical Engineering
- NSWC Crane

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The U.S. Navy seeks a partner for licensing and collaboration on a new method and apparatus for testing an electrically fired item, such as a cartridge, primer, or initiator, where parameters including pulse duration, voltage, and number of pulses can be varied and measured.

An all up round (AUR) includes an assembled round or bullet made of a housing (cartridge), a primer, a projectile, and a propellant. Current test systems for AURs include instrumentation that measures parameters associated with firing the AUR such as case mouth pressure, velocity of the projectile, and action time, which is the time from when energy is applied to the primer of the bullet to when the projectile leaves the gun barrel muzzle. Current test systems for AURs are also known to test the propellant in the AUR. Some rounds include electric primers which are activated by an externally provided electric charge, as opposed to a mechanical impact. The electric primer in turn ignites the primary propellant. Existing testing equipment for AURs is unable to test the electric primer functionality. Further, existing test equipment is unable to control an application of required voltages in varied durations to the electric primer of the AUR.

NSWC Crane has designed and uses the patented method and apparatus for functionally testing electrically initiated items, such as primers, for temperature and pressure data. The testing method is capable of determining a primer's pressure and temperature while applying voltage to a cartridge's primer and controlling factors including varying degrees of voltage, pulse duration, number of pulses, and in-line resistance. The temperature and pressure data provide an indication of the dynamics of the primer's reaction to a firing pulse.

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