



SOLDIER POWER REGENERATION KIT (SPARK) | TSPID

SPaRK is a lower leg-mounted device able to generate power with each step of gait. The SPaRK device is currently a combat boot add-on and one SPaRK device is worn on each boot. This technology uses generative braking in the ankle joint (when the shin rotates over the ankle joint) to generate significant power to recharge batteries and/or power Soldier electronics. Its user experiences minimal hindrance to range of motion and minimal physical exertion while worn. A technology proof of concept stage has been completed and the technology is now in an optimization stage focusing on battery recharge and making the device lighter, more compact, and more ruggedized for field use.

WHY IS IT NEEDED?

A large quantity of batteries is needed for extended missions. The weight and physical size of these batteries has a negative impact on Soldier performance and there is a lack of compact and lightweight power generation solutions.

SOLDIER PAYOFF:

SPaRK has potential to enhance Soldier field sustainment by providing the dismounted Soldier with a new power generation capability that can augment and extend traditional power sources (e.g. batteries). This would reduce need to carry additional batteries during extended missions.

Power generation accomplished at minimal Soldier metabolic, comfort, or mobility cost.

SPaRK can be used as an emergency backup power supply when battery power is depleted. Faster battery recharge is possible in the standing generator mode (rocking heel forward and backward), but this power generation mode will be more tiring to the Soldier.

PERFORMANCE FEATURES:

- Currently produces 3-4W per foot at 3mph. SPaRK on each boot would allow the Soldier to power an MBITR radio.
- Currently weighs 1.3kg with aim for <0.75kg
- Aiming to recharge 1NiMH AA in 90 minutes at 3mph walk in the optimization stage
- Quick attach/detach (~30s)

POINT OF CONTACT:

Technology, Systems and Program Integration Directorate
Phone: (508) 233-5657, DSN 256-5657
E-Mail: nati-rdns-tsb@us.army.mil



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