CECOM ENERGY HARVESTING

Objective:

- Harvest energy from **human sources** (e.g., movement, body heat, breath, blood pressure, chemical, metabolic, etc.) and/or **ambient sources** (e.g., gravitational, mechanical motion, solar, wind, fluid flow, etc.) to support **Land Warrior power needs**

Potential Benefits to the Army:

- Extended mission length.
- Extended battery replacement / recharge intervals
- Reduction in operating costs
- Reduced Weight

CECOM ENERGY HARVESTING
Program Execution Plan

DARPA Research

CECOM Research

Human energy Conversion (USARIEM)

Piezo Heel Strike contract (Continuum)

DUS&T Effort

Evaluation of Comm'l Systems

- FY02
  Lab / Eval & Demo

- FY04-07
  Land Warrior ATD

CECOM ENERGY HARVESTING
Continuum Control Contract

Contract Award:	**14 Jan 00**
Contract Value:	**$639k**
Title:	**Piezoelectric Energy Harvesting For Soldier Systems**
Period of Performance:	**30 months**
1st Year:	**Technology Development and Evaluation**
2nd/3rd Year:	**Hardware Integration and Prototype Demonstration**

CECOM ENERGY HARVESTING
Dual Use Science & Tech Effort

Contract Award:	**Oct 00**
Potential Contract Value:	**$360k +**
Title:	**Energy Harvesting**
Period of Performance:	**18 months**
Summary:	**Development of a novel Dual-Use Energy Harvesting System**
Cost Sharing:	**CECOM 25%** **DUS&T 25%** **Contractor 50%**

CECOM ENERGY HARVESTING

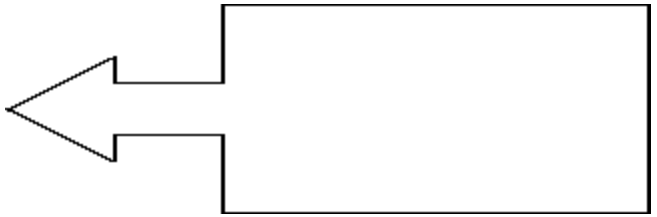
Capabilities	Objectives
Power Output	Up to 30 W
Weight	1 lb.
Volume	9 in^3
Survivability *(EMI, Thermal, Noise)*	0-5 meter non-detectability
Total Energy *(12.5 hr mission)*	60-120 W-hr (LW Mission: ~285 W-hr)

CECOM ENERGY HARVESTING
Potential Weight Savings

Example:

5W average supplied with Energy Harvesting
72 hour mission
360 W-hr total energy available
Energy Harvesting device weight: 1 lbs.

Rechargeable Training Batteries
Recharges = 360/150 = 2.4
Battery weight = 3.0 lbs.



Disposable AWE Batteries (Li/MnO2)
Batteries = 360/310 = 1.2
Battery weight = 1.2 batteries X 2.4 lbs. = 2.8 lbs.