



Portable Power Sources: One Size Fits None

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Outline

- Introduction
- The "Typical Mission"
- Active Power Management
- Fuel Cell Technologies
- Battery Technologies
- Mission Profiling
- Summary



Mesoscopic Devices, LLC
merged with Protonex in April 2007

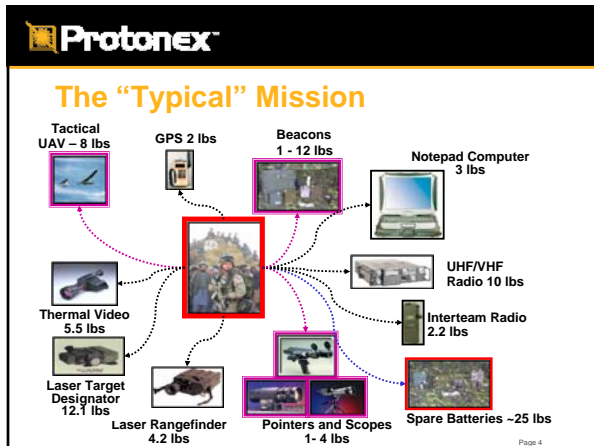
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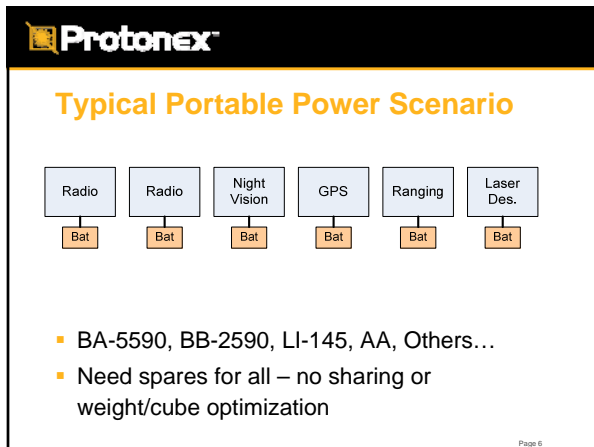
Who Is Protonex?

- Supplier of Military Portable Power Systems
 - Fuel Cell Systems: PEM & SOFC
 - Fuel Processing: Chem. Hydride, Methanol, Propane, JP-8
 - 50W, 75W, 150W, 250W...
- Military Fuel Cell Contracts
 - AFRL, NRL, ARO, ONR, etc...
 - Power Management: AFRL

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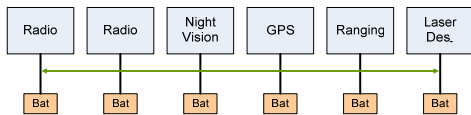




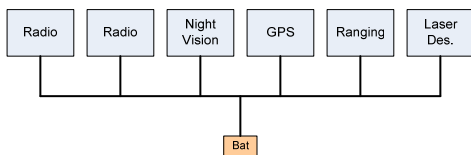
BA & TACP Learnings

- No two soldiers carry an identical complement of equipment
- A single warfighter varies his gear depending upon the mission
- Every soldier carries "too many batteries"
- Much carried energy remains unused – spares needed for all gear to ensure mission success

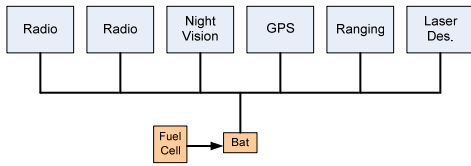
Active Power Management



Active Power Management



Active Power Management



Protonex Power Manager

- Enables Single Energy Source
- Routes Power To Devices
- Wide Range Scavenger
- Mission Profiler



Power Scavenger

- Input: 1.5V to 36V
- Direct Solar Blanket Support
- Maximize Rate / Maximize Efficiency
- Additive to Fuel Cell

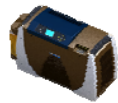


Mission Profiling



Fuel Cells: One Size Fits None

- Fully integrated power systems – fuel in, power out
- Supporting multiple fuel types
 - Hydrogen, Chemical Hydrides, Methanol, Propane, JP-8
- Hydrogen PEM fuel cell technology
- SOFC technology



Valta™ 250 Multi-Purpose APU



150W & 500W Power Generators



75W SOFC Power System



ProPack™ C50 Man-Portable Power

Batteries: One Size Fits None

- **High Energy vs. High Power**
- Medipak Warrior-Pak
- MicroSun
- Li-145
- PTX-A123
- AA





Summary

- Active Power Management Reduces Battery and Mission Weight Without Reducing Soldier Options
 - Shares power among multiple devices
 - Reduces wasted redundant "spares weight"
 - Incorporates wide range scavenging capability
 - Provides mission profiling and planning capability
- Compatible with multiple fuel cell and battery technologies
- Being Demonstrated in Protonex Booth

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