Solar Power Adapters and Deployable and Renewable Alternative Energy Module

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AGENDA

- **SPACES Project**
  - **Past Solar Power Adapter Efforts (SPACES)**
  - **Current SPACES Projects**
    - **Multipurpose Solar Device**
    - **24 Volt Tactical Radio Power Adapter (RPA)**
    - **Computer Power Adapter**
- **DREAM Project**

SPACES

- **Solar power adapters are part of the Solar Portable Alternative Communications Energy Sources (SPACES) project.**
- **SPACES is a family of solar powered devices intended to increase employment flexibility and reduce external power requirements.**
- **Some standard interfaces will be required**

PAST SPACES EFFORTS

- **Began in late 2005, concluded in mid-2006**
- **SPACES (v1.0) Included the following items:**
  - **Lead-acid battery chargers**
    - **Generator**
    - **Vehicle**
  - **Communications-electronics battery charger**
  - **Computer power adapter and battery charger**
  - **Radio power adapter and battery chargers**
    - **12 Volt Tactical Radios**
    - **24 Volt Tactical Radios**
  - **Variable power supply**

SPACES v1.0 OUTCOME

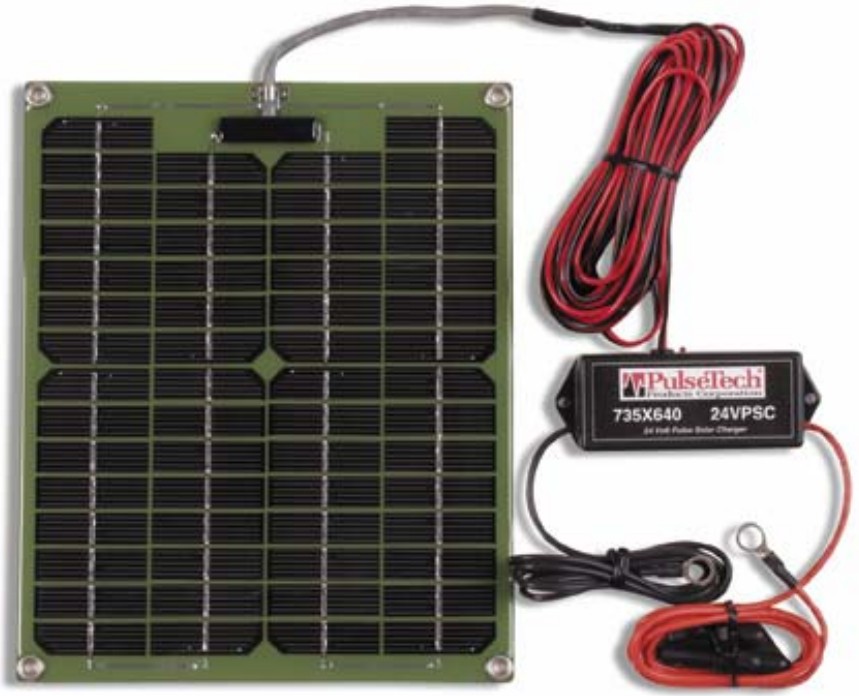
ITEM	OUTCOME
Lead Acid (Gen)	GSA (Pulse-Tech)
Lead Acid (Veh)	GSA (Pulse-Tech)
Battery Charger	RFP/no successful proposals
Computer Adapter	RFP/no successful proposals
12 Volt RPA	RFP/no successful proposals
24 Volt RPA	RFP/no successful proposals
Var Power Supp	Not pursued

LEAD-ACID BATTERY CHARGERS

- **Lead-acid battery chargers**
  - **SP-BC-LA-G (Generator)**
  - **SP-BC-LA-V (Vehicle)**
- **Intended to maintain charge in generator and vehicle batteries**
- **Separate competitive selections were made for the generator and vehicle chargers**
- **Pulse-Tech 24 Volt chargers were selected for both items**
  - **Generator charger does not have push-to-test battery meter**
  - **Vehicle charger has push-to-test battery meter**

LEAD-ACID BATTERY CHARGERS

- **Current status:**
  - **Vendor selected**
  - **Available**
  - **Modification Instruction (MI) for generator version is complete and published for TQG series**
  - **MI for vehicles is pending**



SPACES v1.0 REVIEW

- **Success for only 2 of 6 items in the SPACES family.**
- **What went wrong?**
  - **Did not communicate with industry during our specification development (no request for infomation, industry day, etc.)**
  - **Did not develop industry contacts to disseminate our request for proposals widely**
  - **Attempted an off-the-shelf contracting strategy when industry would have to develop the item**
  - **Requested performance levels were ambitious**

SPACES v1.0 REVIEW

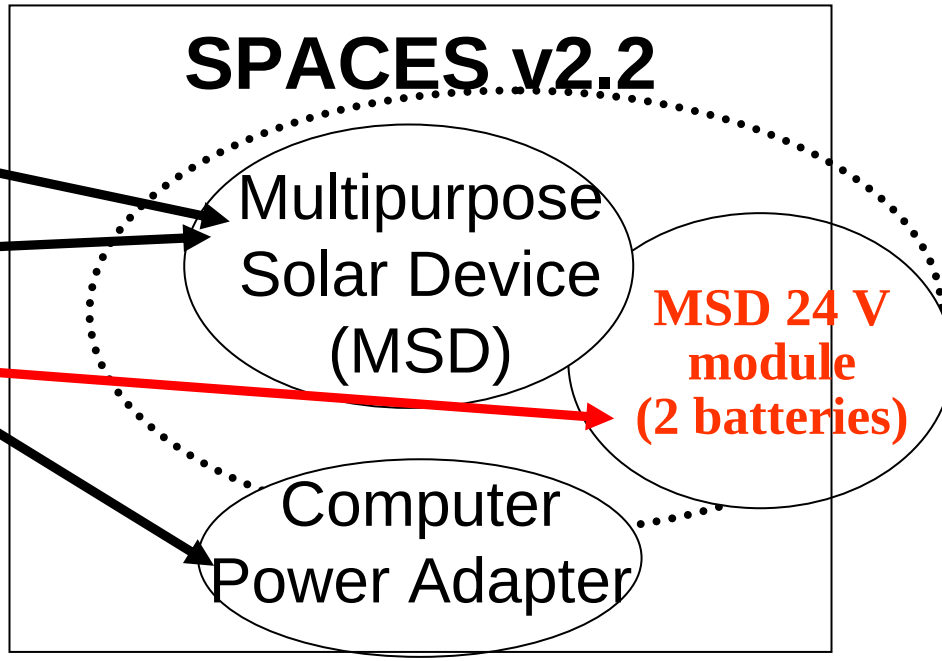
- **What else went wrong?**
  - **Small business set aside (based on market research) probably limited us to vendors who could least afford to absorb initial development/integration costs**
  - **We required bid samples – they were intended to reduce risk for the government, but providing them probably exacerbated all the other issues in play at the time.**

SPACES v2.2 STRATEGY

- **Most SPACES (v1.0) solicitations failed to attract successful proposals.**
- **The original strategy for SPACES was to pursue an integrated system for the second generation.**
- **Our approach is to seek an integrated solution now rather than continue to pursue the original SPACES items.**
- **Focus is on three items that provide full capability set of the original project:**
  - **Multipurpose Solar Device (MSD)**
  - **24 Volt Radio Power Adapter**
  - **Computer Power Adapter**

REVISED DEVELOPMENT PATH

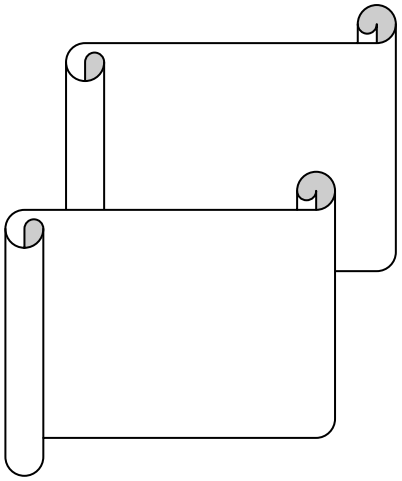
1. SP-BC-LA-G(enerator)
2. SP-BC-LA-V(ehicle)
3. SP-BC-BB
4. SP-CPA-BC
5. SP-RPA-BC-12V
6. SP-RPA-BC-24V
7. ~~SP-VPS~~



MSD SYSTEM CONCEPT

- **Multipurpose Solar device (MSD)**
- **Multiple components packaged together as a kit.**
- **Components may be used or left behind as the mission dictates (within weight limit of 12 lbs).**
- **“Heart” of the system is a battery box/battery charger.**
- **Battery box/battery charger accepts multiple types of power input.**
- **Battery box/battery charger has an output connector that allows adapters to power various 12 Volt tactical radios.**
- **Expanded capability for 24 Volt radios is a planned upgrade.**

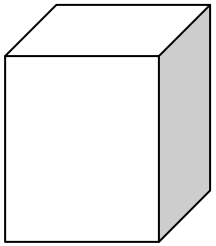
MULTIPURPOSE SOLAR DEVICE



Solar panel(s)

Probably need two 55 W or one 100 W (?) to meet power requirements

"Y" cable to connect if two panels are used



Contains one battery and charging electronics

Waterproof

12-32 VDC input with ECO-Mate connector (polarity protected)

Single radio compatible output (2x12V) connector TBD

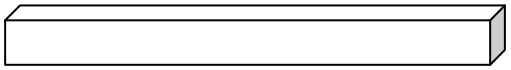
Acts as BB charger

Other Input Adapters

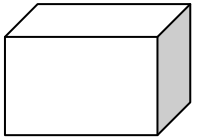
24 VDC mini-NATO

110 VAC wall plug TO 24 VDC

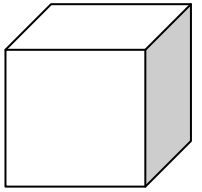
10 foot ECO-Mate to ECO-Mate extension cord (for vehicle distribution system)



AN/PRC-119 A/B/C/D Adapter, probably rubber gasket and cord used with existing battery box



AN/PRC-119 (F) Adapter, probably replacement battery door with cord



AN/PRC-148 MBITR battery adapter

MSD VS SP4 AND SP4+

	SP4	SP4+	MSD
Solar Input	**Yes**	**Yes**	**Yes**
Other DC Input	**No**	**Yes**	**Yes**
AC Input	**No**	**Yes**	**Yes**
Charge BB-2590/U	**Yes**	**Yes**	**Yes**
Charge BB-390B/U	**No**	**?**	**Yes**
Charge other batteries	**No**	**Yes**	**No**
Radio Power Adapter	**No**	**No**	**Yes**

MSD TIMELINE

• Discussions with vendors	Feb 07-Apr 07
• Request For Proposals	May 07-Jul 07
• Select/Award up to two vendors	Oct 2007
• Deliver 2 systems for Test	Dec 2007
• First article Testing and LUE	Dec 07-Mar 08
• Select final configuration/vendor	Mar 08
• Conduct Production Verification Test and FUE	May 08-Aug 08
• Production Articles available	late 08/early 09

SPACES v2.0

- **Multipurpose Solar device (MSD)**

  In Progress

- **24 Volt Radio Power Adapter**

  Planned Upgrade to MSD

- **Computer Power Adapter**

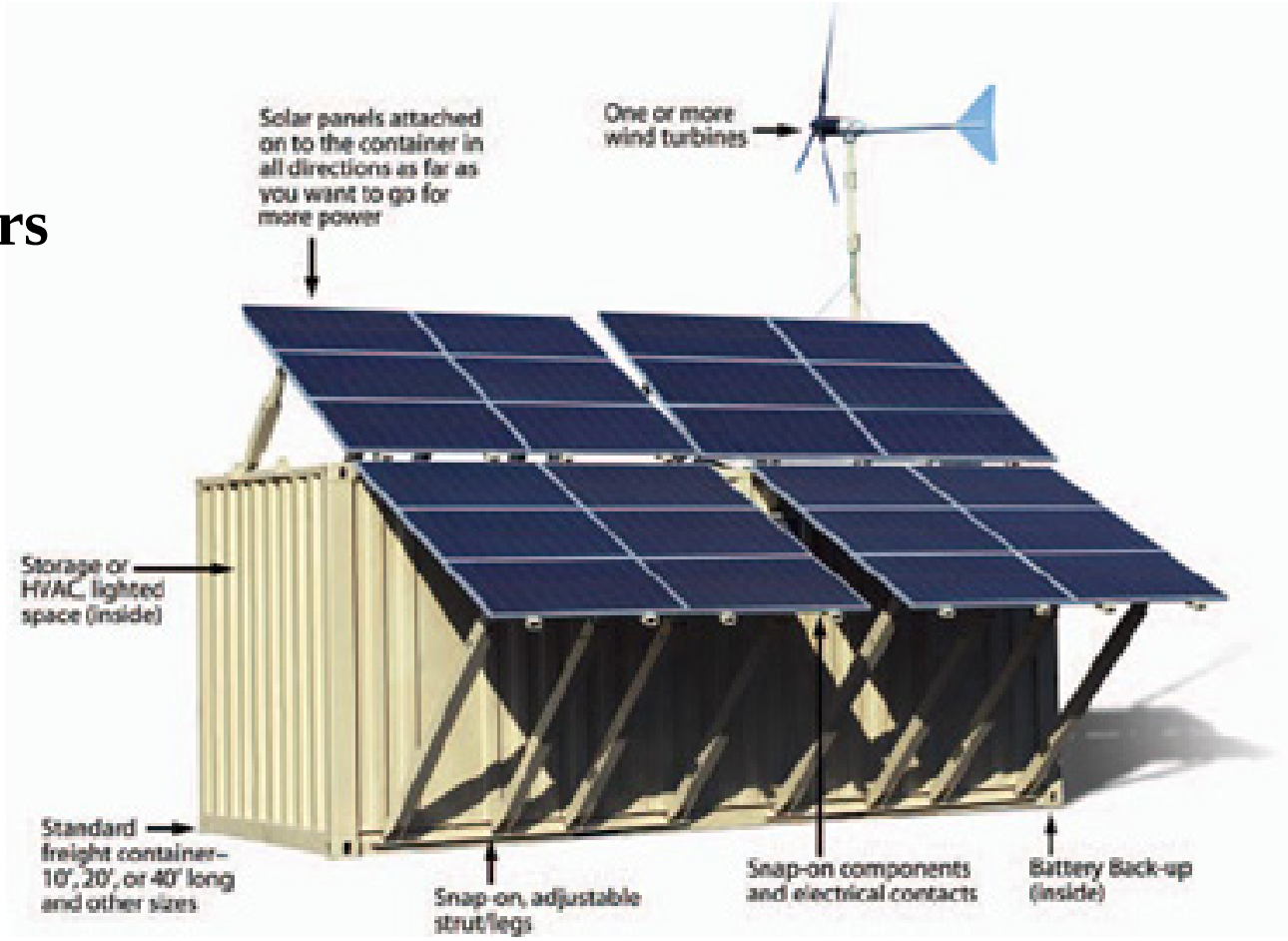
  Pending

SPACES MSD

- **What are we doing differently this time?**
  - **Released a request for information to industry and disseminated as widely as possible.**
  - **Modified performance specification based on responses.**
  - **Open to discussions on draft performance specification prior to release of request for proposals.**
  - **Changed contracting strategy to include a separate phase for first article production (in place of bid samples)**

DREAM PROJECT

- **Deployable & Renewable Energy Alternative Module (DREAM)**
- **Combination:**
  - **Diesel generators (backup)**
  - **Solar**
  - **Wind**
  - **Battery storage**



DREAM PROJECT

- **MNF-West (Iraq) submitted Joint Rapid Resource Request**
- **Objective is for 3 alternative/renewable energy capabilities to lessen fuel transport demand**
  - **<u>HMMWV Towable small system – 3-5 kilowatts output power</u>**
  - **Medium Truck Towable – 10-15 kilowatts output power**
  - **Heavy Truck Transportable – 30 kilowatts output power**
- **We have selected the small (3-5 kW) system as the first effort.**

DREAM PROJECT

- **USMC effort with ONR Rapid Technology Transition (RTT) funding (FY07-08)**
  - **Loaded Weight ≤ 4200 lbs**
  - **HMMWV towable**
  - **Up to 5 kW Output (3 kW continuous output)**
  - **Energy storage in batteries**
  - **May use:**
    - **solar**
    - **wind**
    - **Back-up generator**
  - **≥ 15 days without refuel**

Previous US Army demonstration

DREAM PROJECT

- **Contract is for R&D - 3 phases**
  - **Phase 1 – Trade-studies for system performance, sizing**
  - **Phase 2 (Option 1) - Build, test, and demonstrate prototype system**
  - **Phase 3 (Option 2) - Support to Government test events**
- **Schedule:**
  - **Award** **Apr 07 (three vendors)**
  - **Phase 1** **Apr 07-Jul 07 (three vendors)**
  - **Phase 2** **Jul 07-Feb 08 (up to two vendors)**
  - **Phase 3** **Mar 08-Jul 08 (one vendor)**
  - **Final hardware configuration available late 08/early 09**

DREAM PROJECT

Questions ?

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