

**TEST REPORT FOR THE  
SHOCK EVALUATION OF THE  
POWERSTAR PS-6000-ISO-A  
UNINTERRUPTIBLE POWER SUPPLY**

**November 20, 2000**

**Prepared by**

**Naval Air Warfare Center Aircraft Division  
St. Inigoes, MD 20684-0010**

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**TEST REPORT FOR THE SHOCK EVALUATION OF THE  
POWERSTAR PS-6000-ISO-A UNINTERRUPTIBLE POWER SUPPLY**

**1. INTRODUCTION.** NAWCAD personnel conducted MIL-S-901D lightweight, Grade "A," class I, high-impact shock testing of the Uninterruptible Power Supply (UPS). The testing complied with NAVSEAINST 9072.1, "Shock Hardening of Ships; Policy for," MIL-STD-2036, "Military Standard, General Requirements for Electronic Equipment Specifications," and "High Impact Shock Test Procedure for the Powerstar PS-6000-ISO-A Uninterruptible Power Supply." This testing was conducted at the Environmental Laboratory of NAWCAD St. Inigoes, MD on February 9, 2000. The shock test procedures are included as appendix A. The test data sheets are included as appendices B and C.

**2. DESCRIPTION.**

**2.1. Equipment Description.** The UPS provides constant battery backup power to a connected electrical device in case there is a loss of ship's power. The UPS provides enough power to safely shut down the electrical device without damage to the device.

**2.2. Shock Test Acceptance Criteria.** The acceptance criteria are provided in the following paragraphs.

**2.2.1. Minimum Acceptable Performance Parameters.** The UPS must remain secure to the test fixture so as not to pose any projectile hazard to personnel or surrounding Grade "A" equipment. All monitored parameters must remain within specified limits.

**2.2.2. Extent of Momentary Malfunction, if Permitted.** No momentary physical malfunction responsible for any projectile hazard is permitted. Momentary operational malfunctions or interruptions in continuity will be permitted provided they are self-correcting.

**2.2.3. Degree of Permanent Functional Impairment Allowed.** No degree of permanent functional impairment is allowed.

**3. TESTING AND EVALUATION.**

**3.1. Pre-shock Physical Inspection.** No breakage, yielding, misalignment, unbalance, cracks, or separation were detected during the pre-shock inspection of the UPS. All hardware was torqued to the specifications listed in table I. All critical tolerances were satisfactory. Additional details of the pre-shock physical inspection can be found in appendix B.

**TABLE I. FASTENER TORQUE SPECIFICATION CHART**

<u>Fastener</u>		<u>Torque</u>
<u>Size</u>	<u>CRES</u>	<u>Units</u>
#10	30	Inch-pounds

**3.2. Pre-shock Functional Testing.** The results of these tests were used as a baseline for evaluating the ability of the UPS to withstand shock and are included in appendix B. This test confirmed that the unit was fully functional and performed as specified.

### **3.3. Shock Test Installation and Conduct.**

**3.3.1. Installation.** The UPS was mounted in the simulated 19-inch electrical equipment cabinet using slide rails and the six face panel 10-32 mounting screws. The cabinet/equipment assembly was attached to the interface plate with four 5/8-11 grade 8 bolts. This assembly was mounted to fixture 11C of the lightweight shock table depicted in figure 12 of MIL-S-901D with forty ½-13 grade 8 bolts.

**3.3.2. Conduct.** MIL-S-901D, Grade "A" testing of the UPS was conducted by subjecting the unit to a series of nine blows from the lightweight shock test machine's 400-lb hammer. These blows were delivered from heights of 1, 3, and 5 feet in all three mutually perpendicular axes. The UPS was monitored during each blow for physical damage and projectiles. The UPS was also monitored for loss of output power.

**3.4. Shock Evaluation.** No permanent physical or electrical anomalies were noted during the testing of the UPS on November 20, 2000. The following paragraphs give an account of the shock evaluation results.

**3.4.1. X-Axis (Side-to-Side).** Blows 1, 2, and 3 were delivered parallel to the x-axis at hammer heights of 1, 3, and 5 feet, respectively. No permanent physical or electrical anomalies in the operation of the UPS were noted.

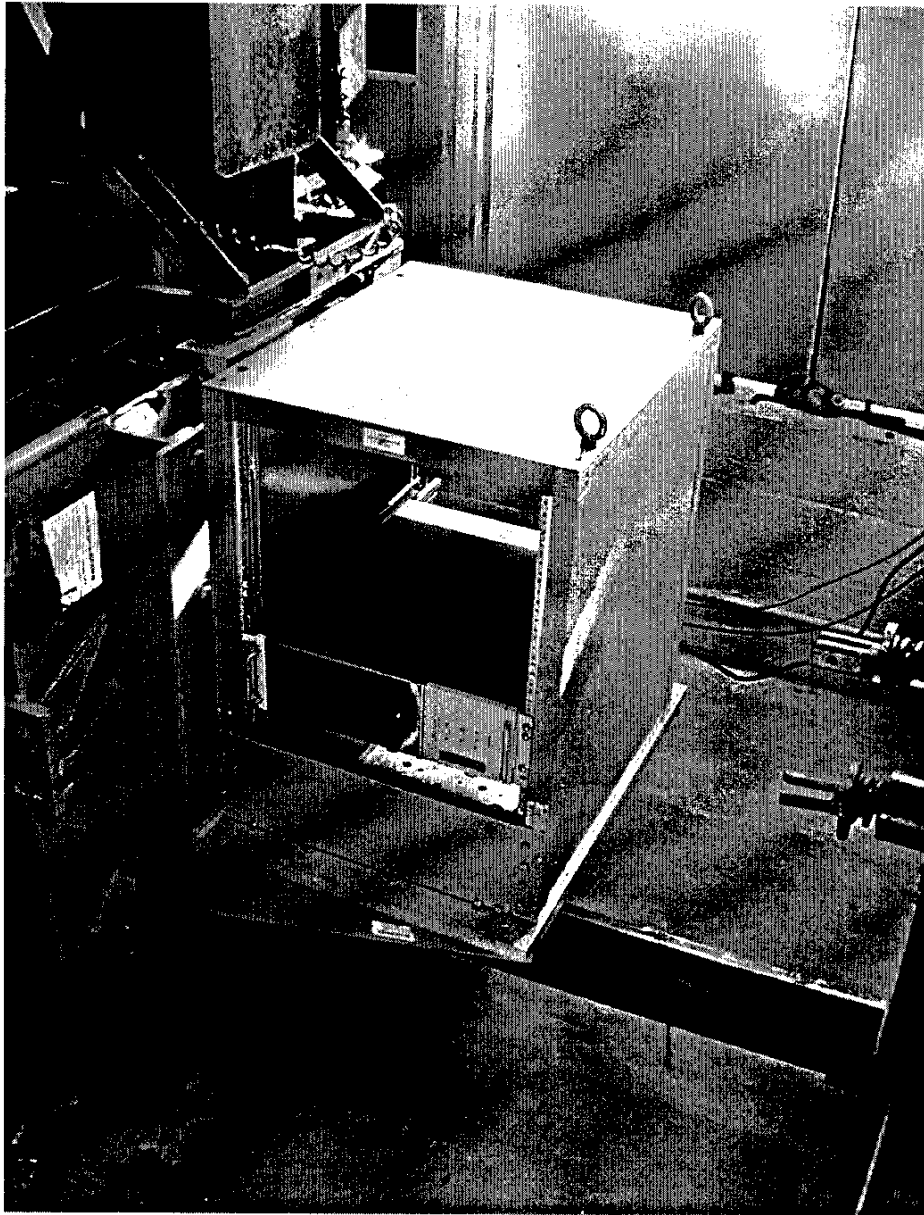
**3.4.2. Y-Axis (Vertical).** Blows 4, 5, and 6 were delivered parallel to the y-axis at hammer heights of 1, 3, and 5 feet, respectively. No permanent physical anomalies in the operation of the UPS were noted, however, the AC cutoff switch tripped during both the 3 and 5 foot blows. Both times the UPS converted to battery power without a break in output power. The switch was manually reset without a break in output power and testing continued.

**3.4.3. Z-Axis (Fore -Aft).** Blows 7, 8, and 9 were delivered parallel to the z-axis at hammer heights of 1, 3, and 5 feet, respectively. No permanent physical or electrical anomalies in the operation of the UPS were noted.

**3.5. Post-Shock Physical Inspection.** The post-shock inspection revealed no breakage, yielding, misalignment, unbalance, cracking, or separation. All critical tolerances, clearances and bolting torques were satisfactory. Additional details of the post-shock physical inspection can be found in appendix B.

**3.6. Post-Shock Functional Testing.** The post-shock functional test for the UPS was completed with satisfactory results. There were no differences between the pre-shock and post-shock functional test results. The results of these tests can be found in appendix B.

**4. RECOMMENDATIONS.** The UPS performed acceptably, even though the AC power switch tripped during y-axis testing. The UPS did not fail based on the test criteria of the test procedure. Once the switch tripped, the UPS continued to produce power to the test load from the battery and was then switched back to AC power without a break in power. Based on the results of this shock test, the Powerstar PS-6000-ISO-A Uninterruptible Power Supply should be considered to have passed MIL-S-901D, Grade "A" shock testing.



**Figure 1. UPS Mounted for Shock**

**APPENDIX A**  
**SHOCK TEST PROCEDURE FOR THE**  
**POWERSTAR PS-6000-ISO-A UNINTERRUPTIBLE POWER SUPPLY**

**HIGH-IMPACT SHOCK TEST PROCEDURE  
FOR THE POWERSTAR PS-6000-ISO-A UNINTERRUPTIBLE POWER SUPPLY**



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# HIGH-IMPACT SHOCK TEST PROCEDURE FOR THE POWERSTAR UNINTERRUPTIBLE POWER SUPPLY

**1. SCOPE.** This document provides explicit instructions for conducting a Grade “A,” lightweight, high-impact shock test according to MIL-S-901D, “Requirements for (High Impact) Shipboard Machinery, Equipment, and Systems Shock Tests.” The results of this test will serve as the basis of the Navy’s acceptance or rejection of the Powerstar uninterruptible power supply (UPS) as shock qualified. This equipment will be subjected to a preshock physical inspection and functional test. It will then be subjected to a lightweight shock test at a Navy-approved facility where it will be monitored during the test for operational degradation. Upon completion of the shock test, the unit will be subjected to a post-shock physical inspection and functional test. Post-shock test data will be compared to preshock data in order to assess the performance of the equipment under test. Naval Air Warfare Center Aircraft Division (NAWCAD) Patuxent River, St. Inigoes, MD, will provide a Government witness for this shock test.

## **2. EQUIPMENT IDENTIFICATION.**

### **2.1. Item.**

- a. Name: Uninterruptible Power Supply
- b. Type: Rack mount
- c. Nomenclature: N/A
- d. Rating: 1.5 KVA
- e. Service: Shipboard
- f. Military Specification and Technical Manual Number: N/A

### **2.2. Manufacturer.**

Powerstar, Inc.  
9073 Shady Grove Ct.  
Gaithersburg, MD 20877

### **2.3. Model Number**

Model: PS-6000-ISO-A  
Serial Number 11140012

### **2.4. Size or Capacity. 900 W**

### **2.5. Plan Number. N/A**

**2.6. Physical Dimensions.**

- a. Height: 5.25 inches
- b. Width: 19 inches
- c. Depth: 20 inches

**2.7. Weight.** 80 lbs.

**2.8. Height of Center-of-Gravity above Base of Equipment.** N/A

**2.9. Requirements of MIL-S-901D.**

- a. Test Category: Lightweight
- b. Grade: Grade "A"
- c. Equipment Class: Class I
- d. Shock Test Type: Type "A"
- e. Mounting Location: Hull-mounted

**2.10. Mounting Aboard Ship Represented during Shock.**

- a. Plane: Face
- b. Orientation: Unrestricted

**2.11. Fasteners Used for Attachment of the Powerstar UPS to a 19-inch Simulated Electrical Equipment Cabinet during the Shock Test.**

- a. Corrosion resistant steel (CRES)
- b. Size: 10-32 x 0.75-inches UNF-2A
- c. Material: Stainless steel
- d. Specification: MS51958-65

**2.12. Hold-Down Bolt Torque.** See Table I.

**TABLE I. BOLT TORQUE CHART**

<b><u>Fastener Size</u></b>	<b><u>Grade 5 (120 PSI)</u></b>	<b><u>Grade 2</u></b>	<b><u>Torque Units</u></b>
#10	27	30	Inch-Pounds

**2.13. Description of Resilient Mounts, if Used.** N/A

**2.14. Major Components and Attached Items in Test.**

- a. Powerstar Uninterruptable Power Supply
- b. Simulated 19-inch electrical equipment test cabinet (see figure 1)

**2.15. Test Laboratory and Address.**

Environmental Lab  
NAWCAD, Bldg. 8009  
St. Inigoes, MD 20684-0010

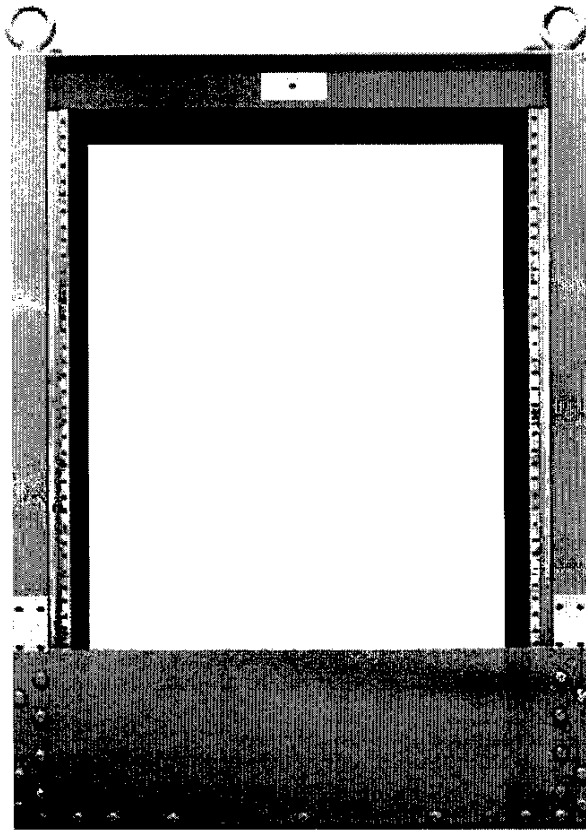
**2.16. Test Instrumentation and Monitoring Equipment.**

- a. A five bulb light fixture approximating the maximum power load of the UPS.
- b. Viper 820 digital recording computer.

**3. PRESHOCK EQUIPMENT INSPECTION.** The Powerstar UPS shall be physically inspected and the results recorded on the Preshock Equipment Inspection Data Sheet found in appendix A, table A.1. This inspection will be conducted prior to the preshock functional test.

**4. PRESHOCK FUNCTIONAL TEST.**

**4.1. Purpose.** The Powerstar UPS will undergo preshock functional testing to establish an operational baseline. The results of this test will be recorded on the Preshock Functional Test Data Sheet found in appendix A, table A.2. This baseline will be compared to the results of the post-shock functional test to determine if any operational degradation has occurred as a result of the shock test.



**FIGURE 1. SIMULATED 19-INCH ELECTRICAL EQUIPMENT CABINET**



**4.2. Initial Conditions and Setup.** The initial setup procedure ensures that the configuration of the Powerstar UPS matches the operational requirements for this shock test. Perform the following functions to configure the equipment.

<u>Step</u>	<u>Function</u>
1	Ensure the UPS is turned off.
2	Connect 115 VAC service to the UPS rear panel.
3	Connect the light strip power cord to the UPS rear panel.
4	Connect the computer power cord to the UPS rear panel.

**4.3. Procedure.**

<u>Step</u>	<u>Procedure</u>
1	Turn the UPS on. Verify that the UPS performed selftest, checking all LEDs and ensuring that the status AC LED flashes for a few seconds then remains lit. Record the results on the data sheet.
2	At the light fixture, place both switches to the ON position and verify that all lights illuminate. Record the results on the data sheet.
3	Turn the computer on and verify it is operating.
4	Unplug the UPS power cord. Verify the following: <ul style="list-style-type: none"><li>a. Status AC LED extinguishes</li><li>b. UPS audible alarm sounds</li><li>c. Status battery LED flashes for a few seconds then remains lit</li><li>d. All lights remain lit</li><li>e. Computer continues operating</li></ul> Record the results on the data sheet.
5	Plug the UPS power cord into a 115 VAC outlet. Verify the following: <ul style="list-style-type: none"><li>a. Status battery LED extinguishes</li><li>b. Status AC LED illuminates</li><li>c. All three lights remain lit</li><li>d. Computer continues to operate</li></ul> Record the results on the data sheet.
6	Set the on/off switch to OFF. Observe that the UPS de-energizes.

## 5. SHOCK TEST PROCEDURE.

**5.1. Purpose.** This shock test will determine if the Powerstar UPS can pass MIL-S-901D shock testing and qualify to this specification for safe incorporation into the fleet.

**5.2. Primary Witness.** NAWCAD representative Mr. Darrell Mason (Code 4.5.8.3.2) will witness the shock test, the pre- and post-shock test inspections, and the functional testing.

**5.3. Alternate Witness.** An alternate NAWCAD representative will be available to witness the testing and inspections if the primary witness is unavailable.

**5.4. Test Setup.** The Powerstar UPS will be mounted in the simulated 19-inch electrical equipment cabinet (see figure 1) using slide rails and the six face-panel 10-32 mounting screws. Shock pins are not provided and will not be used. The cabinet/equipment assembly will be attached to the interface plate with four 5/8-11 grade 8 bolts. This assembly will be mounted to fixture 11C of the lightweight shock table depicted in figure 12 of MIL-S-901D with forty 1/2-13 grade 8 bolts.

**5.5. Test Method.** The test setup described in paragraph 5.4 will be subjected to a series of blows from the lightweight shock test machine's 400-lb hammer. These blows will be delivered from heights of 1, 3, and 5 feet in each of the three mutually perpendicular axes: x-axis, y-axis, and z-axis. The sequence in which the blows are delivered and any test or equipment anomalies will be recorded on the Shock Test Data Sheet found in appendix A, table A.3.

**5.6. Operational Requirements during Shock Test.** The Powerstar UPS shall remain operational during all blows of the shock test. This will be determined by monitoring front panel indications, the light strip, and the monitoring computer.

**5.7. Simulation of Items during Shock Test.** No simulation of items will be necessary.

## 6. MONITORING.

### 6.1. Monitoring during All Blows.

<u>Step</u>	<u>Procedure</u>
1	Turn the UPS on. Observe that the UPS performs self test, checking the LEDs, and the status AC INPUT LED flashes for a few seconds then remains lit. Record the results on the data sheet.
2	At the light fixture, place both switches to the ON position and verify that all lights become lit. Record the results on the data sheet.
3	Turn the computer on and verify it is operating.
4	During and after the shock test, verify that all lights remain illuminated and that the computer continues to operate. Record the results on the data sheet.

## 6.2. Post Blow Functional Test.

### Step

### Procedure

- 1 Unplug the UPS power cord. Verify the following:
  - a. Status AC LED extinguishes
  - b. UPS audible alarm sounds
  - c. Status battery LED flashes for a few seconds then remains lit
  - d. All lights remain lit
  - e. Computer continues operating

Record the results on the data sheet.

- 2 Plug the UPS power cord into a 115 VAC outlet. Verify the following:
  - a. Status battery LED extinguishes
  - b. Status AC LED illuminates
  - c. All three lights remain lit
  - d. Computer continues to operate

Record the results on the data sheet. Repeat the procedures in paragraphs 6.1 and 6.2 for each successive blow.

**7. POST-SHOCK EQUIPMENT INSPECTION.** Upon completion of the shock test, the Powerstar UPS will be subjected to a post-shock physical inspection. The results and comparisons with the preshock inspection data will be recorded on the Post-Shock Equipment Inspection Data Sheet found in appendix A, table A.14.

## **8. POST-SHOCK FUNCTIONAL TEST.**

**8.1. Purpose.** The Powerstar UPS will undergo post-shock functional testing to determine if it experienced any degradation in operation as a result of the shock test. The results will be recorded in appendix A, table A.15.

### **8.2. Procedure.**

#### Step

#### Procedure

- 1 Turn the UPS on. Verify that the UPS performed self test, checking all LEDs and ensuring that the status AC LED flashes for a few seconds then remains lit. Record the results on the data sheet.
- 2 At the light fixture, place both switches to the ON position and verify that all lights illuminate. Record the results on the data sheet.
- 3 Turn the computer on and verify that it is operating.

**Step**

**Procedure**

- 4 Unplug the UPS power cord. Verify the following:
- f. Status AC LED extinguishes
  - g. UPS audible alarm sounds
  - h. Status battery LED flashes for a few seconds then remains lit
  - i. All lights remain lit
  - j. Computer continues operating
- Record the results on the data sheet.
- 5 Plug the UPS power cord into a 115 VAC outlet. Verify the following:
- e. Status battery LED extinguishes
  - f. Status AC LED illuminates
  - g. All three lights remain lit
  - h. Computer continues to operate
- Record the results on the data sheet.
- 6 Set the on/off switch to OFF. Observe that the UPS de-energizes.
- Record all test equipment information on table A16.

**9. SHOCK TEST ACCEPTANCE CRITERIA.**

**9.1. Minimum Acceptable Performance Parameters.** The Powerstar UPS must remain secure to the test fixture so as not to pose any projectile hazard to personnel or surrounding Grade “A” equipment. All monitored parameters must remain within specified limits.

**9.2. Extent of Momentary Malfunction, if Permitted.** No momentary physical malfunction responsible for any projectile hazard is permitted. Momentary operational malfunctions or interruptions in continuity will be permitted provided they are self-correcting.

**9.3. Degree of Permanent Functional Impairment Allowed.** No degree of permanent functional impairment is allowed.

**APPENDIX A**

**DATA SHEETS**

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**TABLE A.1. PRESHOCK EQUIPMENT INSPECTION DATA SHEET**

(1) Breakage:

(2) Yielding:

(3) Misalignment:

(4) Unbalance:

(5) Cracks:

(6) Separation:

(7) Critical Tolerance Clearance:

(8) Bolting Torque:

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**TEST CONDUCTOR**

---

**GOVERNMENT WITNESS**

---

**DATE**

**TABLE A.2. PRESHOCK FUNCTIONAL TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	Self Test AC LED indicator	Passed Steadily lit	_____ _____
2	Light fixture	ON	_____
3	Computer	Operating	_____
4	AC LED	Extinguished	_____
	Audible alarm	Sounds	_____
	Battery LED	Lit	_____
	Light fixture	ON	_____
	Computer	Operating	_____
5	Battery LED	Extinguished	_____
	AC LED	Lit	_____
	Light fixture	ON	_____
	Computer	Operating	_____

---

**TEST CONDUCTOR**

---

**GOVERNMENT WITNESS**

---

**DATE**

**TABLE A.3. SHOCK TEST DATA SHEET**

MIL-S-901D LIGHTWEIGHT SHOCK TEST

DATE: \_\_\_\_\_

TEST ITEM #1 \_\_\_\_\_ MODEL: \_\_\_\_\_ SERIAL #: \_\_\_\_\_

TEST ITEM #2 \_\_\_\_\_ MODEL: \_\_\_\_\_ SERIAL #: \_\_\_\_\_

TEST ENGINEER: \_\_\_\_\_ SHOCK MACHINE: \_\_\_\_\_

<u>AXIS</u>	<u>DROP HEIGHT</u>	<u>NO. OF DROPS</u>	<u>DROP SEQUENCE</u>
X Horizontal (fore/aft)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Y Vertical	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Z Horizontal (side/side)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**TABLE A.4. MONITORING DURING BLOWS TEST DATA SHEET**

**BLOW 1**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	_____ _____

**BLOW 2**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	_____ _____

**BLOW 3**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	_____ _____

**BLOW 4**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	_____ _____

---

**TEST CONDUCTOR**

---

**GOVERNMENT WITNESS**

---

**DATE**

**TABLE A.4. MONITORING DURING BLOWS TEST DATA SHEET (Cont'd)**

**BLOW 5**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	_____ _____

**BLOW 6**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	_____ _____

**BLOW 7**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	_____ _____

**BLOW 8**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	_____ _____

**BLOW 9**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	_____ _____

---

**TEST CONDUCTOR**

---

**GOVERNMENT WITNESS**

---

**DATE**

**TABLE A.5. MONITORING POST-BLOW 1 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	_____
	UPS audible alarm	Sounds	_____
	Battery LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____
2	Battery LED	Extinguished	_____
	AC LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

**TABLE A.6. MONITORING POST-BLOW 2 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	_____
	UPS audible alarm	Sounds	_____
	Battery LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____
2	Battery LED	Extinguished	_____
	AC LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

**TABLE A.7. MONITORING POST-BLOW 3 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	_____
	UPS audible alarm	Sounds	_____
	Battery LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

\_\_\_\_\_  
TEST CONDUCTOR

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GOVERNMENT WITNESS

\_\_\_\_\_  
DATE

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
2	Battery LED	Extinguished	_____
	AC LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

**TABLE A.8. MONITORING POST-BLOW 4 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	_____
	UPS audible alarm	Sounds	_____
	Battery LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____
2	Battery LED	Extinguished	_____
	AC LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

**TABLE A.9. MONITORING POST-BLOW 5 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	_____
	UPS audible alarm	Sounds	_____
	Battery LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____
2	Battery LED	Extinguished	_____
	AC LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

TEST CONDUCTOR

GOVERNMENT WITNESS

DATE

**TABLE A.10. MONITORING POST-BLOW 6 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	_____
	UPS audible alarm	Sounds	_____
	Battery LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____
2	Battery LED	Extinguished	_____
	AC LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

**TABLE A.11. MONITORING POST-BLOW 7 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	_____
	UPS audible alarm	Sounds	_____
	Battery LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____
2	Battery LED	Extinguished	_____
	AC LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

**TABLE A.12. MONITORING POST-BLOW 8 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	_____
	UPS audible alarm	Sounds	_____
	Battery LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

TEST CONDUCTOR

GOVERNMENT WITNESS

DATE

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
2	Battery LED	Extinguished	_____
	AC LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

**TABLE A.13. MONITORING POST-BLOW 9 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	_____
	UPS audible alarm	Sounds	_____
	Battery LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____
2	Battery LED	Extinguished	_____
	AC LED	Illuminated	_____
	Light fixture	Lit	_____
	Computer	Operating	_____

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**TEST CONDUCTOR**

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**GOVERNMENT WITNESS**

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**DATE**

**TABLE A.14. POST-SHOCK EQUIPMENT INSPECTION DATA SHEET**

(1) Breakage:

(2) Yielding:

(3) Misalignment:

(4) Unbalance:

(5) Cracks:

(6) Separation:

(7) Critical Tolerance Clearance:

(8) Bolting Torque:

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**TEST CONDUCTOR**

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**GOVERNMENT WITNESS**

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**DATE**

**TABLE A.15. POST-SHOCK FUNCTIONAL TEST DATA SHEET**

<b><u>Step</u></b>	<b><u>Function</u></b>	<b><u>Expected Results</u></b>	<b><u>Actual Results</u></b>
1	Self Test AC INPUT indicator	Passed Steadily lit	_____ _____
2	Light fixture	ON	_____
3	Computer	Operating	_____
4	AC LED Audible alarm Battery LED Light fixture Computer	Extinguished Sounds Lit ON Operating	_____ _____ _____ _____ _____
5	Battery LED AC LED Light fixture Computer	Extinguished Lit ON Operating	_____ _____ _____ _____

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**TEST CONDUCTOR**

\_\_\_\_\_  
**GOVERNMENT WITNESS**

\_\_\_\_\_  
**DATE**



**TABLE A.16. TEST EQUIPMENT SERIAL NUMBERS AND CALIBRATION DATES**

<u>Equipment</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Calibration Date</u>	<u>Date Used</u>	<u>Remarks</u>
_____	_____	_____	_____	_____	_____

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TEST CONDUCTOR

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GOVERNMENT WITNESS

\_\_\_\_\_  
DATE

**APPENDIX B**  
**TEST PROCEDURE DATA SHEETS**

**APPENDIX A**  
**DATA SHEETS**  
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**TABLE A.1. PRESHOCK EQUIPMENT INSPECTION DATA SHEET**

(1) Breakage: *none*

(2) Yielding: *none*

(3) Misalignment: *none*


(4) Unbalance: *none*

(5) Cracks: *none*

(6) Separation: *none*

(7) Critical Tolerance Clearance: *Satisfactory*

(8) Bolting Torque: *Satisfactory*

  
\_\_\_\_\_  
TEST CONDUCTOR

  
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GOVERNMENT WITNESS

*11-21-2000*  
\_\_\_\_\_  
DATE

**TABLE A.2. PRESHOCK FUNCTIONAL TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	Self Test AC LED indicator	Passed Steadily lit	
2	Light fixture	ON	
3	Computer	Operating	
4	AC LED Audible alarm Battery LED Light fixture Computer	Extinguished Sounds Lit ON Operating	
5	Battery LED AC LED Light fixture Computer	Extinguished Lit ON Operating	

TEST CONDUCTOR

GOVERNMENT WITNESS

11-20-2000  
DATE

**TABLE A.3. SHOCK TEST DATA SHEET**

MIL-S-901D LIGHTWEIGHT SHOCK TEST

DATE: \_\_\_\_\_

TEST ITEM #1 \_\_\_\_\_ MODEL: \_\_\_\_\_ SERIAL #: \_\_\_\_\_

TEST ITEM #2 \_\_\_\_\_ MODEL: \_\_\_\_\_ SERIAL #: \_\_\_\_\_

TEST ENGINEER: \_\_\_\_\_ SHOCK MACHINE: \_\_\_\_\_

<u>AXIS</u>	<u>DROP HEIGHT</u>	<u>NO. OF DROPS</u>	<u>DROP SEQUENCE</u>
X Horizontal (fore/aft)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Y Vertical	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Z Horizontal (side/side)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TABLE A.4. MONITORING DURING BLOWS TEST DATA SHEET**

**BLOW 1**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	

**BLOW 2**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	

**BLOW 3**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	

**BLOW 4**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	

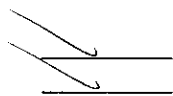
  
 \_\_\_\_\_  
**TEST CONDUCTOR**

  
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**GOVERNMENT WITNESS**

11-20-2000  
 \_\_\_\_\_  
**DATE**

**TABLE A.4. MONITORING DURING BLOWS TEST DATA SHEET (Cont'd)**

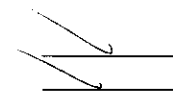
**BLOW 5**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	 -switched to battery power

**BLOW 6**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	 -switched to battery power

**BLOW 7**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	

**BLOW 8**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	

**BLOW 9**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
4	Light fixture Computer	Lit Operating	

  
TEST CONDUCTOR

  
GOVERNMENT WITNESS

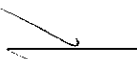
11-20-2000  
DATE



**TABLE A.5. MONITORING POST-BLOW 1 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	
	UPS audible alarm	Sounds	
	Battery LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	
2	Battery LED	Extinguished	
	AC LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	

**TABLE A.6. MONITORING POST-BLOW 2 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	
	UPS audible alarm	Sounds	
	Battery LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	
2	Battery LED	Extinguished	
	AC LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	

**TABLE A.7. MONITORING POST-BLOW 3 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	
	UPS audible alarm	Sounds	
	Battery LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	

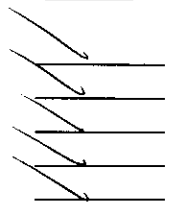
  
**TEST CONDUCTOR**

  
**GOVERNMENT WITNESS**

11/25/2000  
**DATE**


<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
2	Battery LED AC LED Light fixture Computer	Extinguished Illuminated Lit Operating	

**TABLE A.8. MONITORING POST-BLOW 4 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED UPS audible alarm Battery LED Light fixture Computer	Extinguished Sounds Illuminated Lit Operating	
2	Battery LED AC LED Light fixture Computer	Extinguished Illuminated Lit Operating	

**TABLE A.9. MONITORING POST-BLOW 5 TEST DATA SHEET**

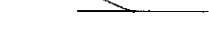
<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED UPS audible alarm Battery LED Light fixture Computer	Extinguished Sounds Illuminated Lit Operating	
2	Battery LED AC LED Light fixture Computer	Extinguished Illuminated Lit Operating	

  
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**TEST CONDUCTOR**

  
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**GOVERNMENT WITNESS**

11-20-2000  
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**DATE**

**TABLE A.10. MONITORING POST-BLOW 6 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	
	UPS audible alarm	Sounds	
	Battery LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	
2	Battery LED	Extinguished	
	AC LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	

**TABLE A.11. MONITORING POST-BLOW 7 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	
	UPS audible alarm	Sounds	
	Battery LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	
2	Battery LED	Extinguished	
	AC LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	

**TABLE A.12. MONITORING POST-BLOW 8 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED	Extinguished	
	UPS audible alarm	Sounds	
	Battery LED	Illuminated	
	Light fixture	Lit	
	Computer	Operating	

  
TEST CONDUCTOR

  
GOVERNMENT WITNESS

11-70-2000  
DATE

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
2	Battery LED AC LED Light fixture Computer	Extinguished Illuminated Lit Operating	

**TABLE A.13. MONITORING POST-BLOW 9 TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	AC LED UPS audible alarm Battery LED Light fixture Computer	Extinguished Sounds Illuminated Lit Operating	
2	Battery LED AC LED Light fixture Computer	Extinguished Illuminated Lit Operating	

  
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**TEST CONDUCTOR**

  
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**GOVERNMENT WITNESS**

11-10-2002  
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**DATE**

**TABLE A.14. POST-SHOCK EQUIPMENT INSPECTION DATA SHEET**

(1) Breakage: *none*

(2) Yielding: *none*

(3) Misalignment: *none*

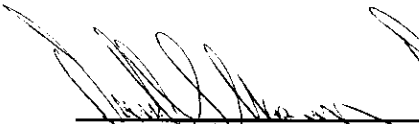
(4) Unbalance: *none*

(5) Cracks: *none*

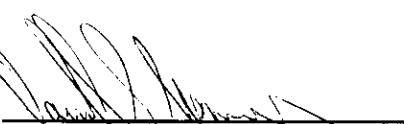
(6) Separation: *none*

(7) Critical Tolerance Clearance: *Satisfactory*

(8) Bolting Torque: *Satisfactory*



**TEST CONDUCTOR**

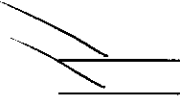
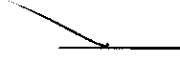
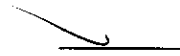
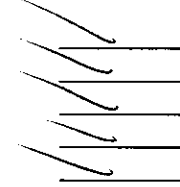
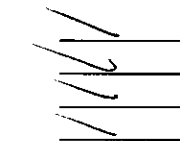


**GOVERNMENT WITNESS**

*11-20-2009*

**DATE**

**TABLE A.15. POST-SHOCK FUNCTIONAL TEST DATA SHEET**

<u>Step</u>	<u>Function</u>	<u>Expected Results</u>	<u>Actual Results</u>
1	Self Test AC INPUT indicator	Passed Steadily lit	
2	Light fixture	ON	
3	Computer	Operating	
4	AC LED Audible alarm Battery LED Light fixture Computer	Extinguished Sounds Lit ON Operating	
5	Battery LED AC LED Light fixture Computer	Extinguished Lit ON Operating	

  
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**TEST CONDUCTOR**

  
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**GOVERNMENT WITNESS**

11-70-7500  
**DATE**

**TABLE A.16. TEST EQUIPMENT SERIAL NUMBERS AND CALIBRATION DATES**

<u>Equipment</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Calibration Date</u>	<u>Date Used</u>	<u>Remarks</u>

  
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**TEST CONDUCTOR**

  
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**GOVERNMENT WITNESS**

11-20-2000  
\_\_\_\_\_  
**DATE**

**APPENDIX C**  
**ENVIRONMENTAL LAB SHOCK TABLE DATA SHEETS**



# MIL-S-901D SHOCK TEST

## DATA SHEET

NOMENCLATURE: Uninterruptible Power Supply  
MODEL NO. PS-6000-ISO-A  
DATE: 11/20/2000

MANUFACTURER: Powerstar Inc.  
SERIAL NO. 1114001  
TEST ENG. D. Mason

EQUIPMENT ORIENTATION	DROP HEIGHT	NUMBER OF DROPS	DROP SEQUENCE
X-AXIS HORIZONTAL SIDE TO SIDE	1'	1	1
	3'	1	2
	5'	1	3
Y-AXIS VERTICAL UP AND DOWN	1'	1	4
	3'	1	5
	5'	1	6
Z-AXIS HORIZONTAL FRONT TO BACK	1'	1	7
	3'	1	8
	5'	1	9

COMMENTS: