



BATTERY MAINTENANCE TRANSFORMATION



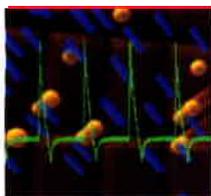
Vehicle Systems

Deployable Battery Shop

Seamless Communications

PulseTech
Products Corporation





3
Scientific Validation
 Pulse Technology has been scientifically proven to make lead-acid batteries stronger so they work harder and last longer than ever before.



4
OEM Applications
 Adding pulse technology to a vehicle in production ensures maximum battery life. Let PulseTech design a custom system for your military vehicles.



5
24-Volt Solargizer
 This pulse technology system ensures battery performance and reduces battery-related costs on everything from HMMWVs to main battle tanks.



6
Battery Shop Operations
 Battery maintenance equipment designed for battery shops, including our 20-amp Pulse Charger, digital battery analyzer and micro ohm load tester.



8
Battery Preservation System Kits
 The biggest challenge for installing Solargizer is armor. See how PulseTech and Logis-Tech teamed up to solve this problem.



9
Battery Accessories
 Recover multiple batteries with the Pulse Recovery System, and increase battery conductivity by 400% with the brass Connector terminal system.



10
Additional Products
 Improve 12- and 36-volt battery performance and reliability with our line of solar powered and ac-powered chargers and maintenance systems.



11
Advanced SINCGARS Alternative Power Supply
 Delivers battery savings never thought possible by eliminating SINCGARS battery use in certain field applications.



12
BATTCAVE
 Everything you need for a comprehensive battery charging and recovery program is included with this exclusive, deployable, heavy-gauge steel unit.

Ten Years of Military Evaluations

"This evaluation indicates that many batteries previously condemned could be reclaimed if the Solargizer were used extensively, assuming there is no internal damage to the battery, i.e., plates, etc."

*United States Air Force
 Management & Equipment Evaluation Program
 February 1991-December 1993*

"Based on the technical results of this study, the Solargizer is recommended as the optimum choice. It can significantly reduce O&S costs by extending the useful life of vehicle batteries. Testing demonstrated that the Solargizer enabled a battery to be recharged using conventional automotive chargers after deep discharge/sulfation."

*Army Research Laboratory
 Solargizer Evaluation Project Report
 January 25, 1995*

"In all four tests, Battery Set 2 (Solargizer) comes closest to the performance of the new batteries...the Solargizer clearly does a better job of conditioning batteries."

*Test Report for U.S. Army
 Tank-Automotive and Armaments Command
 September 25, 1997*

"Moreover, installation of Solargizers should be required in all future vehicle productions, as well as required for all depot/DOL upgrade programs."

*Final Report
 III Corps Comprehensive
 Lead-Acid Battery Management Plan
 October 15, 1998*

"Each vehicle that sits idle for more than 30 consecutive days will be equipped with Solargizers (one per two-battery set)."

*Headquarters Forces Command
 Battery Management Program
 Deputy Chief of Staff for Logistics
 June 1999*

"The Solargizer data proved that the 6TL battery increased its reserve time and that charge retention was significantly improved for the battery that was meant for disposal. The results for the Solargizer support the need for implementation into a battery maintenance plan."

*United States Marine Corps
 Amphibious Vehicle Test Branch
 March 20, 2000*

"The results of this test series show that the Solargizer set has a significant difference in the percent required full capacity from the control set. The solar panel and Solargizer module installation kit design should be standard for all launchers and users."

*MLRS Fire Control System and Munitions
 Technology, Assessment and Validation Final Report
 March 31, 2000*

Pulse Technology: The Science of Solargizer

Recent studies by researchers at two major universities have confirmed that pulse technology does provide the exceptional battery-enhancing benefits featured throughout this catalog. The studies were conducted in response to a request from the military, scientific and engineering communities for scientific validation of claims that our technology actually improves battery efficiency and lengthens battery life. PulseTech contracted with Oakland University in Rochester, Michigan and Ohio State University in Columbus, Ohio to conduct separate evaluations of the technology. These extensive evaluations began in the summer of 1998 and concluded in the Fall of 2000.

Results of the studies confirmed that several significant improvements in lead-acid battery performance are attributable to our pulse technology. These improvements are caused by the effect of the technology in reducing the buildup of large lead sulfate crystals on lead-acid battery plates. This buildup is the main cause of battery problems and failure in most vehicles and equipment.

During these studies, these crystalline buildups were regularly investigated by X-ray diffraction methods. The X-ray diffraction data confirmed the positive effects of pulsing on the battery plate morphology because it shows more even distribution of lead sulfate crystals over the surface area of the battery plates.

It also revealed a significant reduction in the size of the lead-sulfate crystals. These microscopic changes greatly improve a battery's ability to accept and store more energy. Because they store more energy, batteries are lasting longer between recharges, and they are capable of providing more available power than batteries not using our technology.

The effect of the pulsing on the formation of these crystalline structures also increases the battery's durability. pulse technology prevents sulfate-induced corrosion that is the primary cause of shedding of active material. By helping to prevent shedding, the

average life span of the battery can be increased dramatically. Tests show that it is possible to get three or more times as many cycles from pulsed batteries than non-pulsed batteries. As a result, even batteries on frequently-used vehicles and equipment will receive significant benefits.

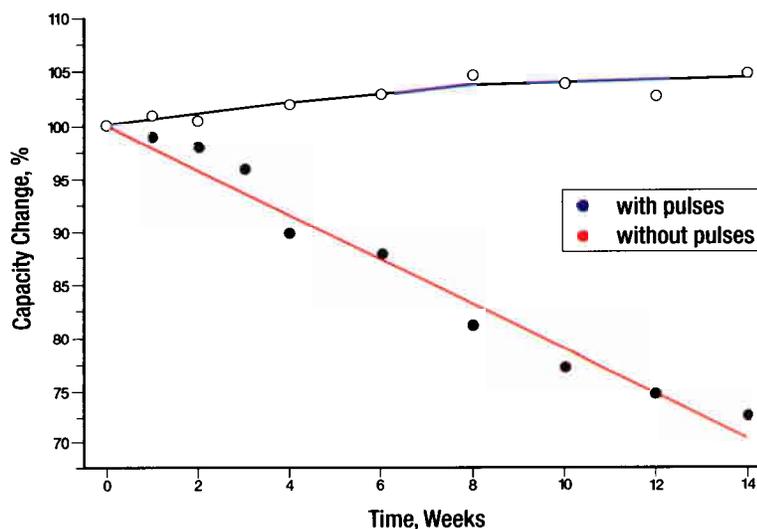
Testing On Stored Batteries: During the Oakland University study, testing was also done on stored batteries to determine how pulse technology would affect military vehicles that sit for long periods of time. The batteries were stored at a constant temperature of 25°C (77°F) for 14 weeks. Some were equipped with Solargizers and others were not.

The final report lists the following results: "There is a distinctive difference in the charge capacity between these two batteries. A battery stored under the influence of pulsation retained its original capacity while the capacity of the battery stored without pulsation lost a considerable amount of charge. The decrease of charge capacity of batteries stored without pulsation decreased linearly with time. After 14 weeks the decrease of charge capacity accounted for about 25% of the battery's original capacity. In this same period of time, the charge of the battery

Microphotographs of battery plates taken during recent independent studies by researchers at two major universities. (Top) A battery plate covered in heavy sulfation buildup which reduces the battery's ability to accept and release energy. (Bottom) Pulse technology removes this buildup which exposes the active material on the battery plates. As a result, batteries are stronger so they work harder and last much longer.

attached to the Solargizer slightly increased. This is probably due to a reconditioning (reforming) process of the battery plates by continuous pulsation. Electron scanning microscopy as well as x-ray spectroscopy clearly underline reasons for the preservation process. During the storage of a battery without pulsation, a formation of large crystallographic domains is observed on the surface of positive electrodes. This is in contrast to the morphology of the battery stored with pulses. A smooth, homogeneous surface with significantly smaller crystals was formed during the storage process due to the pulsation effect."

This chart shows the change of charge capacity on batteries stored with pulse technology and those without. Batteries were stored for 14 weeks at a constant temperature of 25°C (77°F).



Customized Military Battery Solutions

Pulse Technology Systems Designed To Your Specs

The fact that one product can ensure battery performance on everything from a HMMWV to a main battle tank has made the 24-Volt Solargizer (see Page 5) a solution to

military battery problems everywhere. Solargizer and pulse technology can dramatically reduce battery-related costs and downtime which is why militaries around the world have begun installing Solargizer — with great success.

As the use of Solargizer increases, so does its efficiency. Over the past six years Solargizer has experienced

many technical and design advancements. For example, the solar panels are more durable and light sensitive than ever, and the circuit boards are more efficient.

Now, PulseTech offers pulse technology systems that can be customized for your needs, including the 24-Volt Pulse Solar Charger and MilSpec 24-Volt Solargizer.



Top: 24-Volt Pulse Solar Charger. (Bottom) Additional charge output is available by adding a second 28-volt 200 mA solar panel and "Y" connector for vehicles with more than two batteries or excessive parasitic drain

24-Volt Pulse Solar Charger Next Generation System for OEM Applications

This pulse charging system is designed to meet the needs of multiple types of military vehicles using 24-volt battery systems. The unit has been ruggedized for maximum operation efficiency in all environments. The primary mission of the product is to maintain the battery's ability to accept and release energy through pulse technology.

A secondary benefit is the additional charge output generated by the 28-volt solar panel. It delivers approximately 200 mA of pulsing current to two 12-volt batteries in series (24 volts). This pulsing current is designed to offset the "key off" parasitic drain experienced in most combat and tactical vehicles. Also, while it will not be able to keep batteries charged during silent watch, the batteries will be operating near 100% capacity at the beginning of silent watch due to the conditioning pulse and charge current.

The 24-Volt Pulse Solar Charger

also offers the option of adding a receptacle wire harness and jack with a smart power supply for vehicles stored indoors. The pulse will maintain the battery plates on the stored vehicles and equipment in a "clean" condition while the solar panel adds the needed mA charge current. As a result, batteries will be ready to go no matter how long they sit unused.

Additional charge output is also available by adding a second 28-volt 200 mA solar panel and "Y" connector for vehicles and equipment with more than two batteries or batteries with excessive parasitic drain.

Other features include an LED light in the circuit box that lets the user know the unit is operating, 14-gauge insulated wire, heavy duty tinned copper lugs and an in-line watertight connector between the circuit box and solar panel. The wire length between the box and solar panel can also be manufactured to the necessary length according to different vehicle types.

Overall, the 24-Volt Pulse Solar Charger gives the user maximum flexibility with the use of either solar or ac power supplies.

MilSpec 24-Volt Solargizer Battery Maintenance For NBC Vehicles

This truly unique 24-volt Solargizer system is designed to reduce battery problems on all sealed-hull vehicles with highly sophisticated electronic systems. It's fitted with through-the-hull and battery box pin connectors, Teflon-coated wire, and shrink tubing that is resistant to NBC decontamination solvent.

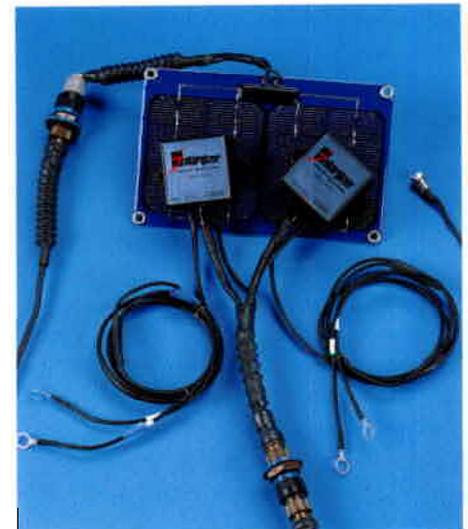
Every MilSpec unit comes with four components:

Solar Panel — In one, two or three solar cell configurations sealed in a single substrate.

Intermediate Wiring Harness — Connects the solar panel to the circuit boards with an additional connector for the ac transformer.

Circuit Box Harness — Consisting of one, two or three circuit boxes which is determined by the number of batteries being maintained. It comes standard with ac transformer capabilities (see Page 5).

AC Transformer — A specially-designed 1.2 amp, 7-volt unit for activating the pulsing circuits when the vehicle is stored indoors.





24-Volt Solargizer®

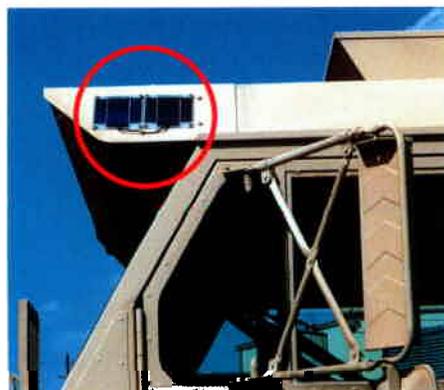
Keep Batteries Strong So They Work Harder & Last Longer

This patented electronic device is currently helping the U.S. Military transform battery maintenance dramatically. It uses pulse technology to make battery systems stronger so they are able to meet the incredible power demands of combat and tactical vehicles worldwide.

Over the past six years the U.S. Military has purchased over 150,000 24-Volt Standard and Receptacle Solargizers, and they are being installed on every type of vehicle and generator in inventory. In fact, U.S. Army Forces Command (FORSCOM) recently identified that *any* vehicle that sits idle for more than 30 days will use Solargizers (one per two-battery set), including armored vehicles (see Page 8).

It has been documented by several military reports that these systems will improve battery performance and reliability. The Final Report from the III Corps Battery Management Plan states: "Solargizer keeps the batteries in a 'like-new' condition allowing the on-board charging system to operate properly and the batteries to operate

(right) A solar panel on the hood of a HMMWV (Below) a Super HETT with 24-Volt Solargizers. The ideal solution to parasitic drain caused by onboard computers.



to maximum performance. Because batteries are constantly conditioned by the pulse, they can work properly for their design life. This extended life translates into fewer replacement purchases, and, therefore, lower costs."

Standard 24-Volt Solargizer: This solar-powered model works with any vehicle using a 24-volt battery system. Each unit incorporates the finest quality single grown photo

voltaic solar cell available. Because batteries are constantly conditioned by the pulse, they can work properly for their design life. This extended life translates into fewer replacement purchases, and, therefore, lower costs."

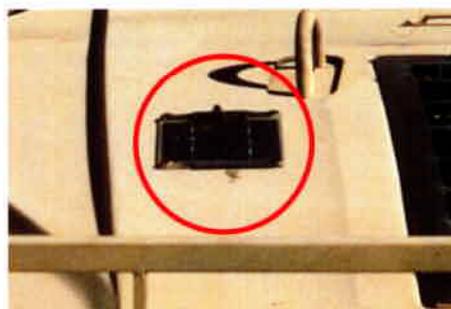
itary vehicles and equipment are stored indoors. That's why PulseTech created the patented Receptacle 24 model. It is a 24-Volt Solargizer that includes a specially designed 110- or 220-volt ac transformer (sold separately) so it can also be used indoors. It was developed originally by PulseTech for the National Guard to reduce battery maintenance on stored vehicles inside special Controlled Humidity Preservation (CHP) shel-

(Left) LAV III by GM Defence equipped with a dual 24-volt solar panel system designed for the vehicle. (Right) Two 24-Volt Solargizer solar panels mounted on the top of an Oshkosh '0-ton truck



voltaic solar cell available. The solar panel is sealed and the circuit board is fully encapsulated making Solargizer totally weatherproof.

The 24-Volt Solargizer includes a complete mounting kit with nylon tie wraps, double-sided tape, hook and loop tape, wire splice connectors, 1/4" nylon washers, 3/8" rubber grommets, 3/8" hex nuts, 3/8" star washers, 1/4" bolts



and 3/4" sheet metal screws.

With combat readiness a central concern for militaries worldwide, Solargizer has proven to be rugged and dependable while increasing battery performance.

Receptacle 24 Solargizer: Many mil-

ters.

Outside, the solar panel absorbs sunlight and turns it into electricity to power the system. When a vehicle is moved inside and the ac adapter is plugged into an electrical outlet, it supplies power in place of the sun.

This system will work with independent power sources such as the one used in the CHP shelters. These shelters use large power supply systems that can handle up to 50 Receptacle units at one time.

The Receptacle 24 Solargizer has been a huge success reducing battery-related costs and labor dramatically.

24-Volt & Receptacle 24 Solargizer Specifications

Weight	1 1/2 lbs.
Solar Panel Dimensions	5 1/2" x 4 1/2" x 3/8"
Circuit Box Dimensions	3 3/8" x 2 3/4" x 1 1/2"
Wire Length	Box to Panel - 25 ft. Box to Battery - 4 ft.
ac Transformer (U.S.)	110V ac, 60 Hz
ac Transformer (Europe)	220V ac, 50 Hz
Transformer Wire Length	25 ft.

Part No.	NSN	Description
735X150	6130-01-392-8347	24-Volt Solargizer with 3/8" Lugs
735X160	6130-01-396-2166	Receptacle 24 with 3/8" Lugs (transformer not included)
735X170	6130-01-396-3053	Specially-Designed AC Transformer, 110 V ac 60 Hz
735X190	6130-01-396-4076	Specially-Designed AC Transformer, 220 V ac 50 Hz



20-Amp Pulse Charger® / World Version

III Corps Battery Recovery Rate Approaches 90%

Recover lead-acid batteries that up until now were thought to be beyond saving with the Pulse Charger/World Version. If you work in a shop or facility that services vehicles and equipment, you need this charger. It's actually four chargers in one!

This revolutionary device is a state-

of-the-art charging system (up to 20 amps) that works with both 12-volt conventional flooded lead-acid batteries and sealed "maintenance-free" batteries, including Valve Regulated Lead-Acid (VRLA), Absorbed Glass Mat (AGM) and gel cell. Plus, it works off 110- or 220-volt ac power so it can be used anywhere in the world.

The Pulse Charger also uses our patented *pulse technology* to prevent the main cause of battery problems and failure: sulfation buildup. By "cleaning" the plates, the Pulse Charger makes the battery stronger so it can do the work it was designed to do. It also helps recover dead batteries by enabling them to accept a charge once again.

Voltage regulated and micro-processor controlled, the Pulse Charger is designed to provide all the charge a battery will accept regardless of the rated amp-hour capacity or rated cold cranking amps. It will charge each 12-volt battery to its optimum level by constantly monitoring

Pulse Charger®/World Version Specifications	
Output Current	12 volts dc/20 Amps dc
Input	100-125/200-250 Volts ac, 3 Amps ac Max, 50-60 Hertz, 1 Phase
Overcharge Protection	100%
Reverse Polarity Protection	Yes
Connections	Two Heavy-Duty Output Cables c/w Industrial Plier-Type Battery Clamps
Cable Length	6 ft.
Enclosure	Industrial Powder-Coated Cabinet
Dimensions	10 1/4" x 11 1/2" x 7"
Weight	26 Pounds

the battery and adjusting the charging current accordingly. The Pulse Charger then automatically shuts off when the battery reaches full charge.

The Pulse Charger has two settings. The *Pulse & Charge* setting will charge the battery while cleaning the plates, and the *Pulse Only* setting will clean the plates. One-year warranty.

Part No.	NSN	Description
746X725	6130-01-398-6951	Pulse Charger®/World Version, 20 Amp Output, 100-250v ac, 50-60 Hz

U.S. Army Battery Shop of the Future

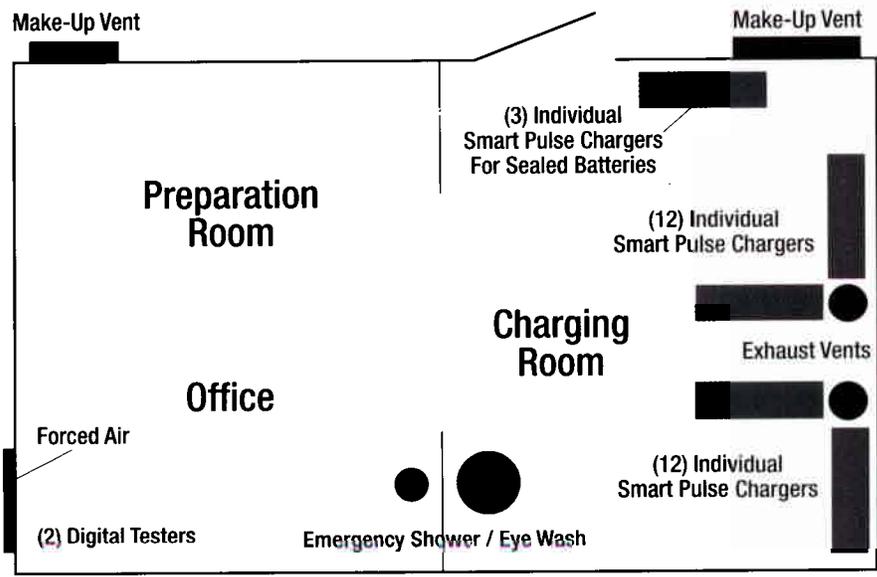
While the U.S. Army is in the process of transitioning to a lighter, more mobile force, they are also going through a dramatic change in their existing battery shops. The diagram at right is the recommended configuration of future U.S. Army battery shops.

As indicated, they will all use the Pulse Charger/World Version, and here's one of the reasons why: In a document titled *Final Report Model Battery Shop of the Future*, it states: "The Pulse Charger was used to charge the same type batteries. Recovery rates (with Pulse Chargers) approached 90%, and end condition was optimized in a time that varied between four and 12 hours per battery."

It also reveals that "'Smart chargers' that incorporate *pulse technology* can be used to further streamline the recovery process and reduce manpower requirements. Pulse Chargers offer the best solution to recovering flooded electrolyte batteries, the most common type in the inventory."

Finally, the report says that besides battery recovery, smart chargers also "provide significant advantages in procedures. Since the chargers are 'flip and forget' systems, guesswork is eliminated.

Segregation by battery type and voltage condition is no longer required. Use of the Pulse Charger eliminates the need for a separate *pulse technology* station, streamlining the process even further."



602nd Main Co. 13th COSCOM, III Corps, Fort Hood, Texas

According to this diagram, the U.S. Army Battery Shop of the Future will incorporate 15 Pulse Chargers for recovering and charging all types of lead-acid batteries.

1-800-580-7554





Digital Battery Analyzers Complete Battery Analysis In Just Seconds

Test the condition of your lead-acid batteries faster than ever with the 475 and 485 Digital Battery Analyzers. These durable, hand-held units provide a complete battery analysis in seconds. Ideal for both military maintenance shops and in the field, the 475 and 485 analyzers display voltage, battery condition and available power quickly so you know immediately if your battery needs service.

Traditional battery tests are too time consuming because batteries need to be fully charged before testing begins. Not with the 475 and 485, you just test and go. These units give an accurate reading on batteries even as low as 5.5 volts.

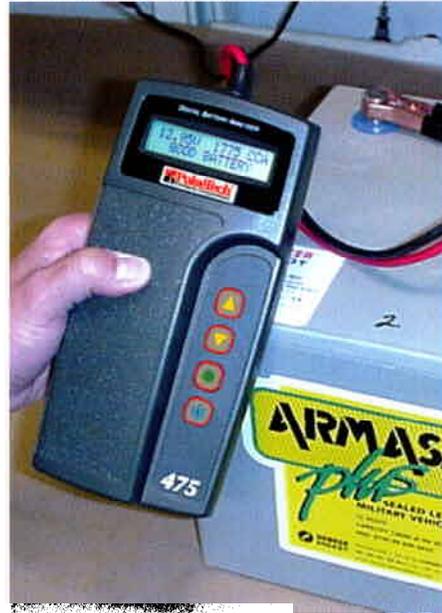
Both testers use a revolutionary method called "conductance testing". Conductance describes the ability of a battery to conduct the current needed for its various functions. It's been proven that a linear relationship exists between battery conductance and capacity — or total energy delivered in time-discharged tests.

Since conductance is proportional to battery capacity, it can effectively

identify cells or batteries which may require attention or replacement due to defects or deterioration. So not only do you save time with the testing, you also reduce the time wasted on trying to charge bad batteries. With the 475 and 485, you test the battery condition first, then recharge only the good ones.

Another advantage is that the voltage and current applied by this type of testing are very low, so it will not harm the battery.

The 475 and 485 both use a simple two-step testing method with easy-to-follow instructions. They even tell



Get complete battery analysis quickly and easily with the PulseTech Digital Battery Analyzers. (Left) A Hawker Armasafe Plus battery being checked with a 475 model. (Right) The 485 being used to diagnose 6TL batteries.

you if a battery merely needs to be conditioned with a PulseTech "pulse technology" product to remove sulfation buildup rather than be replaced.

The 485 also displays charging

Digital Analyzer Specifications	
Operating Range	475: 100-1275 CCA 485: 100-1700 CCA
Voltage Range	475: 5.5 to 14 Volts dc 485: 5.5 to 32 Volts dc
Power Source	Uses power of the battery under test with min. 5.5-volts OCV required
Display	Two Line, 16 Character LCD
Operating Temp.	32° to 120°F (0° to 50°C)
Dimensions	9" x 4" x 2 1/2"
Weight	15 oz. (400 grams)
Computer calibrated according to ISO requirements	

voltage output with a low, normal or high range indication. This means you can detect the possibility of a bad



voltage regulator, faulty wiring or even a bad alternator.

The 475 and 485 Analyzers are the fast, accurate solution to your battery testing needs. One-year warranty.

Part No.	NSN	Description
741X475	6130-01-462-6840	475 Digital Battery Analyzer
741X485	6130-01-477-7821	485 Digital Battery Analyzer



MBT-1 Load Tester Test Your Batteries Quickly

The MBT-1 Micro Ohm Load Tester helps you diagnose potential problems by reading batteries quickly and easily. You can take MBT-1 anywhere. It needs no internal power supply and it's so small it fits right in your pocket.

This unit gives you an accurate reading of single batteries, as well as

batteries wired in series without having to unstrap them. Just touch the leads to the battery posts and it will tell you the condition of your battery using readings that correspond with the FORSCOM Battery Management Plan.

The weatherproof MBT-1 is protected against over voltage and reverse polarity. One-year warranty.

An MBT-2 is currently in development for BA-5590s (CE batteries).

Part No.	NSN	Description
741X800	6130-01-463-8499	MBT-1 (Mini Battery Tester) Micro ohm load tester



Logis-Tech, Inc. Develops Install Kits For Armored Vehicles

As success stories sweep the Army regarding Solargizers, the question most asked isn't "does it work", but "how do I install it?" III Corps developed simple drawings for the installation on all their wheeled vehicles while the Marine Corps wrote Technical Instructions (TIs) for their wheeled fleet. The real challenge came when it was time to install Solargizers on armored vehicles.

Enter Logis-Tech and the development of the Battery Preservation System (BPS™) Kit. In September 1998, the Army National Guard competitively awarded a five-year \$300 million Indefinite Delivery-Indefinite Quantity contract to Logis-Tech for dehumidification services which can be utilized as a contract vehicle by any government agency requiring

this technology. The focus of the contract is on the long-term storage of combat and tactical vehicles in Controlled Humidity Preservation (CHP) Shelters.

The contract includes Battery Preservation System (BPS) to equip Guard vehicles. This consists of 24-Volt Receptacle Solargizers, brass Connectors and Battery Mat. Using large power supplies to activate the Receptacle Solargizers, the BPS is installed to maintain batteries in good working condition.

Logis-Tech was now faced with the same concerns other end users had: How to install on armor without compromising the hull of the vehicle.

Each vehicle was studied with the goal of finding a location on the hull to mount a solar panel bracket that would use existing bolts to secure the bracket. It was also critical that the

location allows wire routing to the battery box to be simple and the wires to be protected. The other concern was to make sure the solar panels were positioned so the sun could power the Solargizers when the vehicle rotated out of the shelter.

Each BPS Kit includes the correct quantity of Solargizers, brass connectors for the battery posts and pre-cut battery mat to fit the battery box. Also included is the mounting bracket for the solar panels, accessories needed for the installation and a detailed easy-to-follow instruction manual.

BPS Kits allow soldiers to properly install a vehicle system and gain the benefits of *pulse technology* and reduced labor time on batteries.

PulseTech and Logis-Tech are teaming up to help the Army reduce battery expenditures and improve vehicle readiness.

Three 94-watt Solargizer solar panels mounted on an M1 A1 Main Battle Tank (left) with a BPS M-1 Kit, and three panels on an M88 Tank Recovery Vehicle (right) with a BPS-M88A1 Kit



1-800-580-7554

PulseTech
Products Corporation

Battery Preservation System (BPS) Kits		LTI BPS Kit Inventory Numbers		
Kit Name	Usable On	Receptacle	Solargizer	Kit Less Solargizer
BPS M-1 *	M-1, M-11P, M-1 A1, M-1 A2	INV0611	INV0449	INV0449LS
BPS BFV-C *	M-2/3, M-2/3AO, M-2/3A1, M-2/3A2. Protects chassis batteries only.	INV0454	INV0801	INV0801LS
BPS BFV-C ODS	M-2/3A2 (ODS). Protects chassis batteries only.	INV0807	INV0794	INV0794LS
BPS BFV-C ODS+	M-2/3A2 (ODS). Upgrades BFV-C kit to ODS configuration	INV0808	INV0793	INV0793LS
BPS M-109A6	All versions of M-109 through A6. All versions of M-992 through A2.	INV0452	INV0628	INV0628LS
BPS M88A1	M-88A1	INV0809	INV0797	INV0797LS
BPS M-113A3	M-113A3, M-901A3 ITV, M-1059A3 Smoke Generator	INV0456	INV0630	INV0630LS
BPS M-981A3 (FSV)	All versions of M-981 through A3.	INV0631	INV0632	INV0632LS
BPS M-113A2	M-113A2, M-901 ITV, M-901 A2, M-1059 Smoke Generator, M-1059A2	INV0634	INV0651	INV0651LS
BPS M-1064A2	M-1064, M-1064A1, M-1064A2 (2 vehicle batteries)	INV0590	INV0633	INV0633LS
BPS M-577A2	M-577, M-577A1, M-577A2 (2 vehicle batteries)	INV0810	INV0804	INV0804LS
BPS MLRS	10 vehicle batteries	INV0811	INV0812	INV0812LS
BPS M-998 (HMMWV)	All variants (2 vehicle batteries), less the Avenger Firing Unit.	INV0636	INV0635	INV0635LS
BPS M-35A2	All M-35 series vehicles (2 vehicle batteries)	INV0813	INV0805	INV0805LS
BPS M-813	All M-809 series 5-Ton Tactical Trucks	INV0637	INV0799	INV0799LS
BPS M-923	All M-900 series 5-Ton Tactical Trucks	INV0814	INV0978	INV0978LS
BPS M-978 (HEMTT)	All HEMTT based Trucks, including the Fuel Tanker	INV0815	INV0806	INV0806LS
BPS M-1075 (PLS)	All M-1075 PLS series vehicles (with parallel/series wiring)	INV0816	INV0800	INV0800LS
BPS FLU-419 (SEE)	Small Engineer Excavator	INV0817	INV0796	INV0796LS
* These BPS kits have assigned National Stock Numbers. NSN assignments for other BPS kits are pending:				
BPS M-1		6117-01-476-7276	6117-01-471-1358	N/A
BPS BFV-C		6117-01-476-3928	6117-01-476-3913	N/A



(Top) PRS is a modular system made up of individual units — a Power Base & Add-On Modules. The Base and each module will pulse up to two 6- and 12-volt lead-acid batteries each. (Bottom) The units can be connected to meet your specific needs (up to ten units total).

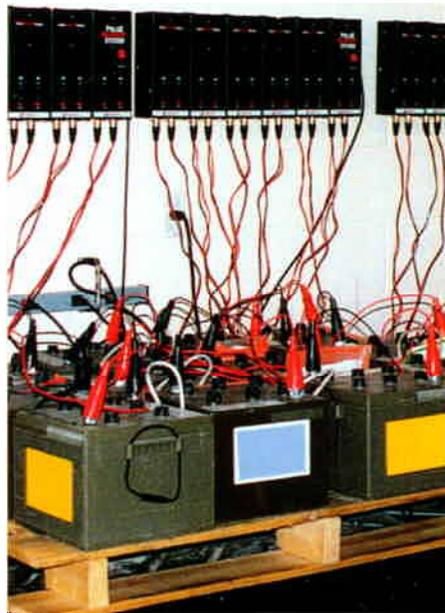
patented pulse technology to recover dead and useless 6-volt and 12-volt batteries that no longer accept a charge.

Designed to use alone or in parallel with large charging stations, the PRS is also ideal for refreshing new batteries that have been sitting in storage too long.

This modular system is available in individual units — a Power Base and Add-On Modules — that condition two batteries each. They are also designed to attach together to meet your specific battery maintenance needs (up to ten units total).

The Pulse Recovery System is easy to use and will not harm batteries. It

works with all types of lead-acid batteries including AGM, gel cell and sealed “maintenance-free” or conventional flooded lead-acid batteries.



(Right) Three PRS 12 systems desulfating pallets of military batteries at Fort Hood, Texas.

Pulse Recovery System[®] Recovers Multiple Batteries At The Same Time

This modular battery maintenance system is ideal for military battery shop operations responsible for servicing multiple combat and tactical vehicles and equipment. The Pulse Recovery System (PRS) uses our

Part No.	NSN	Description
740X650	6130-01-417-3509	PRS 12, 110 Volts (includes 1 Power Base & 5 Add Ons)
740X651	6130-01-458-0981	PRS 12, 220 Volts (includes 1 Power Base & 5 Add Ons)
740X360	6130-01-458-0984	PRS Power Base, 110 Volts
740X361	6130-01-458-0987	PRS Power Base, 220 Volts
740X420	6130-01-458-0989	PRS Add-On Module, 110 Volts
740X421	6130-01-458-0992	PRS Add-On Module, 220 Volts
740X002	6130-01-458-0994	Connection Cable from PRS to Battery

The Connector Stops Battery Corrosion and Increases Conductivity

The Connector stops battery corrosion by creating an airtight contact on the lead posts that prevents acid gas from escaping. At the same time, it provides a more efficient transfer of energy and lower power drain

because electrical conductivity of these solid brass units is almost 400% greater than lead clamps. This also allows multiple battery hookups without the normal power loss associated with clamps.

The Connector also helps the electrical system achieve peak performance with consistent power and steady voltage.



Part No.	NSN	Description
743X300	6160-01-396-0593	T400 Connector, low profile for limited battery top clearance
743X303	6160-01-396-0592	T100EX Connector, has extended 3/8" top stud
743X321	6160-01-396-0599	AK400, 3/8" X 3/8" accessory arm for T400 and T100EX

The Battery Mat[®] Engineered To Prevent Corroded Battery Trays

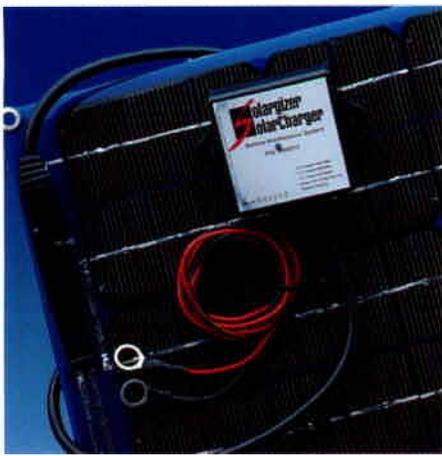
This patented product is the world's only acid-neutralizing mat designed for use beneath all types of lead-acid batteries. It actually traps and neutralizes battery acid that may leak or result from a “boil over”.

The Battery Mat is perfect for use in virtually all combat and tactical vehicles and equipment. Choose from two mat thicknesses to meet your specific vehicle repair needs: a standard-gauge and a heavy gauge. Both thicknesses come in rolls which can be cut to size.

The Battery Mat is safe to handle before and after installation.



Part No.	Description
734X210	Battery Mat, 1' x 50' Standard-Gauge Roll (1/8" Thick)
734X220	Battery Mat, 1' x 50' Heavy-Gauge Roll (3/8" Thick)



Solargizer® Solar Charger Charges & Improves Batteries

This patented solar pulse charger charges and strengthens your 12-volt battery at the same time. It maintains the battery at full capacity — without overcharging — and uses *pulse technology* to prevent the buildup of lead sulfates on the battery plates. This technology also provides a charge lev-

eling effect to equalize the charge across all cells.

The Solargizer Solar Charger is available in three models: 10 Watt (rated at 1 amp), 5 Watt (rated at ½ amp) and 2 Watt (rated at ¼ amp).

All three models are designed for charging frequently- or infrequently-used vehicles and equipment in areas without access to electrical power. Ten-year limited warranty.

Part No.	NSN	Description
735X610	6130-01-438-8660	10-Watt Solargizer Solar Charger, rated at 1 Amp
735X605	6130-01-446-7154	5-Watt Solargizer Solar Charger, rated at 1/2 Amp
735X602	6130-01-446-7162	2-Watt Solargizer Solar Charger, rated at 1/4 Amp

12-Volt Solargizer® Ensure 12-Volt Performance

The Industrial 12-Volt Solargizer offers the same exceptional benefits as the 24-volt model (see Page 5) but it's designed for vehicles and equipment using 12-volt battery systems. Besides strengthening battery plates,

it also prevents the normal loss of battery power on stored vehicles no matter how long they sit unused.

A Receptacle 12 Solargizer is also available for use in areas without sunlight. It includes a solar panel and a specially-designed 110-volt ac adapter that plugs into the circuit box. Ten-year limited warranty.



Part No.	NSN	Description
735X130	6130-01-388-0914	Industrial 12-Volt Solargizer with 3/8" Lugs
735X100	6130-01-388-0245	Industrial 12-Volt Solargizer with Spring-Tension Clamps
735X125	6130-01-388-0917	Industrial 12-Volt Solargizer with Lighter Plug-In
735X140	6130-01-396-2163	Receptacle 12 with 3/8" Lugs (transformer not included)
735X165	6130-01-480-7588	Specially-Designed ac adapter, 110 V ac 60 Hz

Marine Solargizer® For Boats & Other Watercraft

This unit is an Industrial 12-Volt Solargizer designed especially for the rugged demands of bass boats, powerboats, yachts, personal watercraft and other marine vehicles with systems up to 12 volts.

It includes a solar panel with a durable anodized aluminum backing, a circuit box with 3/8" lug attachments,

and heavy-duty 18-gauge double insulated wiring.

To make installation easier, the wire between the panel and circuit box has a quick disconnect, and the unit includes a special mounting kit.

A Receptacle version of the Marine Solargizer is also available. It includes a specially-designed 110-volt ac adapter for use on watercraft stored in areas without direct access to sunlight. Ten-year limited warranty.



Part No.	NSN	Description
735X400	6130-01-462-6817	12-Volt Marine Solargizer with 3/8" Lugs
735X410	6130-01-462-6836	Receptacle 12 with 3/8" Lugs & 110-volt ac Transformer

PowerPulse® Designed Especially For Frequently-Charged Batteries

Like Solargizer, the PowerPulse Battery Maintenance System also uses *pulse technology* to increase battery performance, but, instead of solar power, it can be powered in two different ways. When the battery is

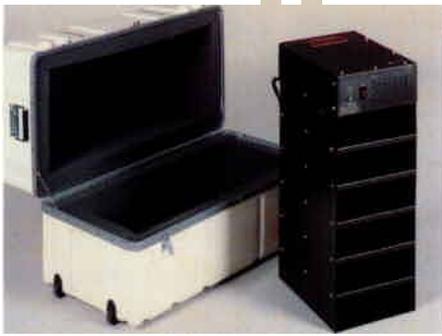
being charged — either by an onboard charger or a separate charging system — it will use the charging current as a power source. The rest of the time it uses a small portion of the battery's own energy.

Designed for vehicles and equipment used frequently or charged on a regular basis, e.g. forklifts and pallet-jacks. Five-year limited warranty.



Part No.	NSN	Description
735X012	6130-01-446-7166	PowerPulse 12-Volt with 3/8" Lugs
735X024	6130-01-417-7509	PowerPulse 24-Volt (Motive) with 3/8" Lugs
735X036	6130-01-417-7507	PowerPulse 36-Volt (Motive) with 3/8" Lugs
735X048	6130-01-417-7506	PowerPulse 48-Volt (Motive) with 3/8" Lugs

(Top left) ASAPS 6 cabinet with optional wheeled carrying case. (Bottom Left) ASAPS-SC with 119-F SINCGARS



ASAPS Specifications	
Dimensions	ASAPS 4: 11 3/4" W X 15 1/2" D X 22" H ASAPS 6: 11 3/4" W X 15 1/2" D X 30 3/4" H ASAPS-SC: 19 3/4" W X 16 1/2" D X 11" H
Weight	ASAPS 4: 60 lbs. ASAPS 6: 70 lbs. ASAPS-SC: 33 lbs.
Cabinet	Powder-Coated Stamped Rolled Steel
Cooling	Thermal Activated Fan
Overload Protection	External Fuse

into the radio battery box. It will power all versions of the SINCGARS including the 119-F version. It also powers the SINCGARS Remote Unit.

Recent field testing has shown that an ASAPS-6 can routinely power six radios for over 12 hours without recharging when used with a fully charged deep cycle battery (200 minute Reserve Capacity). ASAPS is even more effective when the 110-volt ac and 12-volt dc power sources are used together because it protects against loss of communication due to generator failure. Plus, ASAPS will charge the battery it is attached to and requires almost no maintenance.

Most of all, this efficient system will help reduce the cost of using your SINCGARS radios by reducing

these batteries, ASAPS can pay for itself the first time you use it. In fact, a deployed Marine Artillery Battalion saved over \$29,000.00 during an exercise at Fort Bragg, NC.

There are three ASAPS models available, two with shelves (one powers four radios and the other powers six), and the newer, portable ASAPS-SC that allows you to spread out six radios for as much as 25 ft. of separa-

ASAPS

Reduce The Cost of Operating SINCGARS Radios

ASAPS (Advanced SINCGARS Alternative Power Supply) is the innovative system being used by the U.S. Marines and others to power their SINCGARS radios and reduce their dependence on expensive batteries. Unlike BA-5590 batteries that must be purchased and disposed of, or the rechargeable BB-590s or BB-390s that are manpower intensive to use, ASAPS is a reliable power source that can be used indefinitely.

ASAPS is designed to provide constant 12-volt power to your radios using a 110-volt ac generator, line power and/or a 12-volt lead-acid battery (the battery can be installed in a vehicle or free standing). The unit goes virtually anywhere and handles input power fluctuations from 90 to 140-volt ac.

When connected to a battery and an ac power source, ASAPS protects against power failure. It has been updated to include more protection features for the radios.

Unlike other attempts to solve the power cost problem, ASAPS maintains the integrity of the radio and battery box. No parts are removed or altered and ASAPS plugs directly



Marine using an ASAPS 6 system in the field.

the expense of replacing the batteries. The average life of a lithium battery is less than 12 hours once installed. Batteries used on low-use nets will last longer, but high-use nets often go through three batteries a day. By eliminating the replacement cost of

tion. In addition custom configurations are now available on request (additional fees are charged for all custom work).

To maximize the flexibility of the ASAPS system, PulseTech offers a series of optional accessories.

Part No.	NSN	Description
740X804	6130-01-458-4040	ASAPS 4, Supplies power for up to four SINCGARS radios.
740X806	6130-01-458-4041	ASAPS 6, Supplies power for up to six SINCGARS radios.
740X809	6130-01-473-0349	ASAPS-SC, Supplies power for up to six SINCGARS radios.
740X960	6160-01-461-6165	Storage/Carrying Case w/wheels for ASAPS 4 or 6
740X811		4 ft. 6-GA Cord w/Quick Connector & Lugs (12v Ext. Cord)
740X812		4 ft. 6-GA Cord w/Quick Connector & Clamps (12v Ext. Cord)
740X813		20 ft. 6-GA Cord with 2 Quick Connectors (12v Extension Cord)
740X814		20 ft. radio power extension cords
740X815		Set of 6 Battery Box Gaskets
740X816		Set of 6 Battery Extension Links



Deployable and relocatable by conventional means the BATTCAVE is a fully-functional battery maintenance facility that can be moved virtually anywhere.

BATTCAVE
Fully Deployable, Self-Contained Battery Shop

The BATTCAVE™ (Battery Charging And Verification Equipment) is a battery maintenance facility designed to go virtually anywhere at anytime. This field-tested, self-contained unit provides full-range functionality for lead-acid battery charging, maintenance and even recovery.

Manufactured by Safety Storage, Inc. to meet or exceed all applicable standards, the BATTCAVE provides everything you need to run a comprehensive battery management program anywhere. It includes our state-of-the-art charging and verification equipment like the patented Pulse Charger /World Version (see Page 6), and the PulseTech 475 Digital Battery Analyzer (see Page 7). These are the same battery chargers and testers being used in the U.S. Army Forces Command (FORSCOM) Battery Shop of the Future at Fort Hood, Texas.

Made of welded, heavy-gauge steel, the BATTCAVE is weatherproof and extremely durable. It's also HAZMAT, NEC, OSHA and EPA

compliant. Best of all, it's fully deployable and relocatable by conventional means, so it allows you to have a fully operational unit delivered to any location. The flexible BATTCAVE can be employed in garrison, at your training centers and even in the field.

Plus, power for the BATTCAVE isn't a problem. It can use 220-volt shore power, but if that isn't available, it also includes a multi-fuel generator.

Besides giving you an effective means of recovering and charging batteries, the BATTCAVE also offers substantial savings. This prefabricated structure eliminates the cost of constructing permanent buildings, additions and conversions. And, by utilizing the charging and recovery equipment, battery expenditures such as replacement and downtime can be reduced dramatically.

- Dimensions: 10'W X 8'D X 8.5'H (can also be customized to your

- specifications)
- Produced under warranty by Safety Storage, Inc., the leading manufacturer of prefabricated steel lockers and buildings
- Self-contained, deployable and relocatable by conventional means, standard ISO bed deployable on a variety of existing platforms
- Meets military requirements for initial battery fill-and-charge operations
- Interior document control compartments
- Exclusive HLEL exhaust ventilation system with interlock
- Interior lighting
- Secondary containment with corrosive resistant features
- Chemical resistive coating
- Removable flooring sections
- Electrolyte storage station
- Black-out condition compliant
- Redundant safety feature/system

(Top) BATTCAVE uses patented PulseTech charging, recovery and testing equipment, including the 20-amp Pulse Charger/World Version. (Bottom) The BATTCAVE is designed to run off power in two ways: By standard 220V electrical hookup, or with the multi-fuel capable generator included with the unit (also available separately)



Part No.	NSN	Description
740X901	6130-01-477-3976	BATTCAVE, includes GenSet & Service Kit
740X902	6130-01-483-7558	BATTCAVE/ARV (Army Reserve Variant), no GenSet or Service Kit
740X904	6115-01-483-7896	BATTCAVE Service Kit (500 hour)
740X851	6130-01-483-7904	GenSet for BATTCAVE