

Add UPS (Uninterruptible Power Supply) to your bookmobile services

The venerable bookmobile gets a high-tech update for the 1990s—
a reliable, onboard computer power supply

by Russ Topping

HAS YOUR BOOKMOBILE entered the Computer Age?

Many bookmobiles, even those belonging to highly automated library systems, don't yet have onboard computers. Often this is because librarians fear scrambled data caused by fluctuating power from a generator or plugging and unplugging a shore power cord.

To my knowledge, no bookmobile manufacturer or vendor of library automation systems has yet addressed this problem. Bookmobile manufacturers are not computer experts—they're in the vehicle business. Automation firms naturally pay more attention to getting the main system up than to small off-line applications such as bookmobiles. They may provide you with a micro and software, but they don't tell you much about how to mount the equipment. As for a dependable power supply—that's your problem.

Fortunately, it's a problem you can solve relatively cheaply. This article provides instructions, a wiring diagram, and a list of materials to give your bookmobile an Uninterruptible Power Supply, commonly called a UPS (don't confuse it with those brown trucks!). It will give your micro the same kind of constant power source used in large computer centers and will also

Russ Topping has designed, manufactured, and maintained bookmobiles since 1977. Currently, Topping and spouse, librarian **Carol Hole**, are bookmobile/outreach consultants in Gainesville, Fla.

make your automation vendor, your library systems manager, and your bookmobile staff very happy.

As easy as AC-DC

Basically a UPS is a mechanism that stores electrical energy (via a battery) and then feeds it to the computer when the normal source is interrupted. Alternating current (AC) cannot be stored in a battery as direct current (DC) can. The UPS for your bookmobile computer must receive 120-

volt AC current from the bookmobile generator or shore power line, *convert* it to DC current to charge a 12-volt automotive battery, and then *invert* it back to the AC current needed by the computer. This process also protects the computer from voltage surges that can cause data problems.

All the parts for the UPS are available from the sources listed and are used for many similar purposes. Anyone who can follow the wiring diagram should be able to install the system with very few problems. In 1988, the installation cost was about \$600, including labor.

A safety consideration

Romex or solid conductor wire, used in building wiring, is not suitable for use in bookmobiles, which are subjected to greater vibration than buildings. Such materials can break and cause a shock hazard. I caution anyone installing a UPS on a bookmobile to use only multiple-stranded wire in conduit. Multiple-stranded wiring meets all Society of Automotive Engineers (SAE) standards for truck wiring, and will not cause maintenance problems later on.

UPS step-by-step

1. Order the parts listed below.
2. When parts are received, read all instructions and cautions.
3. Select the best locations according to the make of bookmobile. Mount the parts.
 - The inverter and convertor create heat and must be mounted in a well-ventilated compartment. Small fans of the type used to cool computers will provide adequate air flow. The compartment should provide protection from water and dirt, particularly in areas

Also for your bookmobiles:

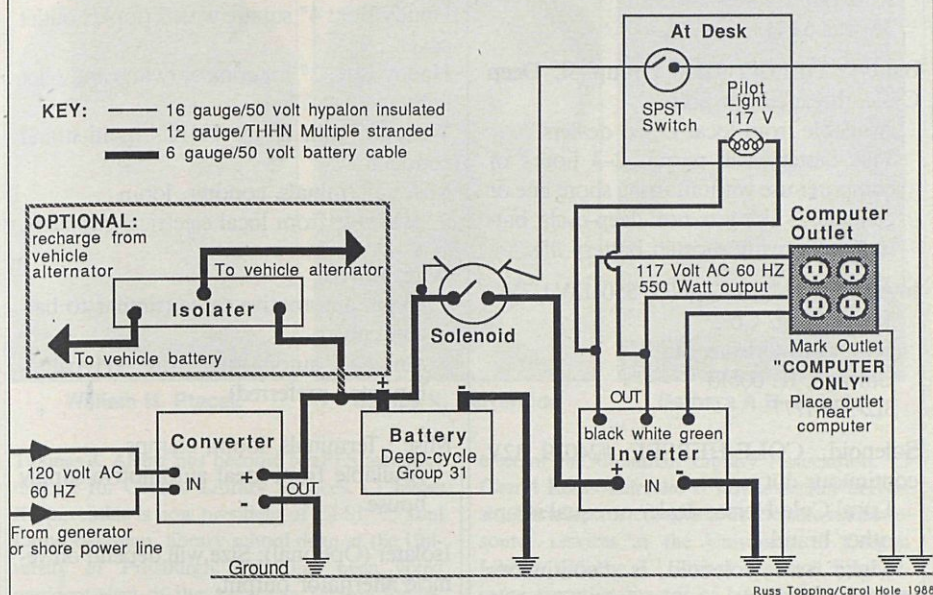
A \$2.98 carbon monoxide detector

A self-mounting patch for detecting carbon monoxide has been used extensively in American Red Cross and other bloodmobiles, and recently the manufacturer suggested that bookmobiles might benefit as well. Such service vehicles can be prone to CO levels that cause headaches, drowsiness, dizziness, and more serious effects.

The detector's orange patch turns gray or black as soon as dangerous concentrations of CO are present. Packaged for a shelf-life of three years, the detectors last a month after opening, and may be re-used during that time. They are not recommended for use with diesel engines.

Libraries may order detectors in quantities of 10 or more at \$2.98 per detector, including shipping. A check or purchase order should be enclosed. Order from Applied Science Corp., POB 16118, Tampa, FL 33687. (Tel. 813-988-3196).

Uninterruptible Power Supply for bookmobile computers



where chloride is used on icy roadways.

- The "maintenance-free" battery can be mounted almost anywhere. It needs only to be accessible for replacement, but should be in a separate compartment to prevent acid fumes from damaging other components.
- The control switch should be placed at the desk to facilitate turning the system on and off.
- Electrical outlets should be installed where computer, monitor, disk drives, and bar code reader power cords can be plugged in, but other equipment *can*

not: the capacity of the UPS is adequate for PCs, but is not adequate for any additional demand.

4. Using proper wire and wiring methods, connect all components as shown in the diagram. *Do not* energize the system until all components are properly wired. Check the voltage output at the computer outlet. If it agrees with the rated output of the inverter, plug everything in and boot up your computer.

Welcome to the new era of the automated bookmobile!

Sources for components on p. 692.

But does it really work?

by Carol Hole, Community Services Coordinator, Alachua County Library

A lucky coincidence—our new bookmobile was built at the time the Alachua County (Fla.) Library was being automated—allowed us to design our bookmobile for computer operations from the beginning. But the power supply designed by Russ Topping and described in this article will work just as well for you.

Our installation has rigid, secure mounts for all parts of the computer. All components, except the inexpensive monitor, are hidden in lockable cabinets to prevent theft—a common problem with bookmobile computers.

The only glitch in one-and-a-half years of operation was that the computer generated more heat than expected. The original fan proved too small to cool both computer and power supply. Although our Apple computer worked flawlessly, we installed a slightly larger fan, just to be safe.

The power supply will run the computer for several hours, and works equally well whether running on a generator or plugged into a shore power cord. As all bookmobilers know, generators are subject to weird power surges, but the only mishap that has cost us any data was caused when a staff member accidentally turned off the battery charger for two days.

The reliability of the UPS has pleased everyone—library staffers, our systems manager who doesn't have to worry about scrambled data, and the installer of our CLSI system, who pronounced it, "the best bookmobile computer installation" he'd ever seen.

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Uninterruptible power supply

Sources for Components

Converter: TRIAD-UTRAD #740-2
B-W Manufacturers, Inc.
P.O. Box 739
Kokomo, IN 46903-0739
317-452-5444

Battery: DELCO #1150 Group 31, Deep Cycle, threaded top posts.

Available from local Delco dealers. This battery will permit 2-3 hours of computer use without using shore line or generator. Using a non-deep-cycle battery will greatly shorten battery life.

Inverter: TRIPP-LITE PV 550 12V-117V
Tripp Mfg. Co.
500 North Orleans St.
Chicago, IL 60610
312-329-1777

Solenoid: COLE-HERSEE #24039 12V continuous duty

Local Cole-Hersee dealer or equal in another brand.

Make sure solenoid is "continuous duty."

Control Switch: Eagle #907V

Pilot Light: Eagle #908V

Wall Plate: Eagle #952V

Mounting Strap: Eagle #913

Duplex Outlet: Eagle #827V or equal in another brand if Eagle not available (two required).

Eagle Electric Mfg. Co., Inc.
45-31 Court Square
Long Island City, NY 11101
718-937-8000

Handy Box: 4" square with 2 duplex outlet cover

Handy Box: 2" for control switch and pilot light

Wire, 120 volt: 12 ga. THHN multi-strand conductor

Misc.: Terminals, conduit, loom
Available from local electrical suppliers.

Wire, 12 volt:

#6 ga. automotive cable (similar to battery cable)

#16 ga. automotive wire (Hypalon-insulated preferred)

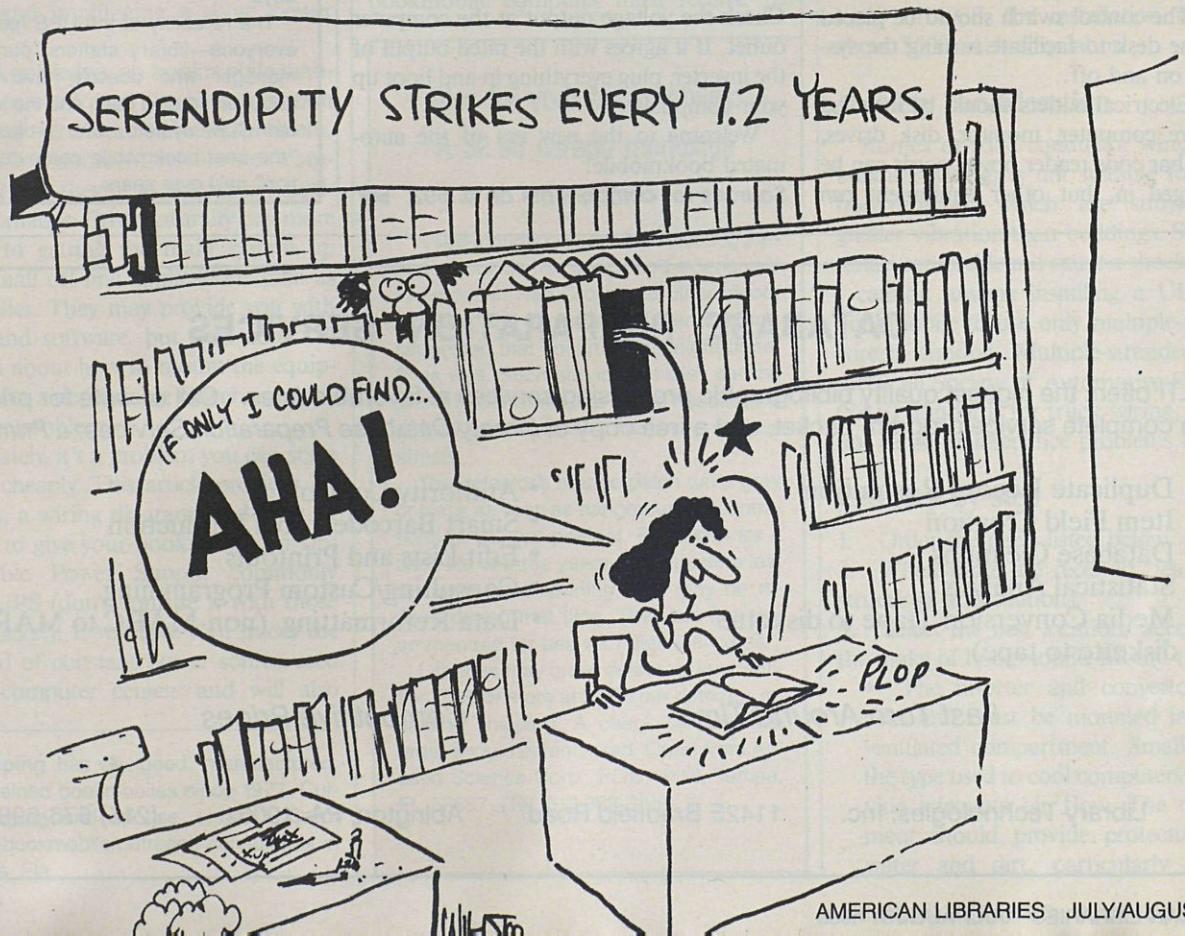
Misc.: Terminals, loom, clamps

Available from local automotive supply house.

Isolater (Optional): Size will depend on vehicle alternator output.

Sure Power Products, Inc.
7415 S.E. Johnson Creek Blvd.
Portland, OR 97206
503-777-4551

Note: With isolater, battery will recharge while driving. If isolater is not used, battery will not recharge without using generator or shore power cord. □



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