technology TODAY

Alan Pierce
Technology.Today@worldnet.att.net

Forever Light

BATTERY-operated devices seem to know when you can least afford them to fail. Even a rechargeable emergency flashlight, if not frequently fully discharged and recharged, might not work when you need it. Most rechargeable batteries can develop "memory" if they are continually recharged before they are fully discharged. A battery that has developed memory will hold its charge for only short periods, and even if you recharge rechargeable batteries properly they still only have a life cycle of a few hundred recharges.

No more batteries. Applied Innovative Technologies, Inc., of Fort Lupton, CO, has developed a new flashlight that will work forever without batteries. Completely different than any other flashlight you might have seen, it doesn't even have an incandescent lightbulb as its light source. A renewable energy source that is, excuse the pun, always at hand powers the NightStar flashlight. In fact, recharging NightStar is child's play. Just shake NightStar up and down for 30 seconds, and it's ready to give you a full-spectrum, blue-tinged white LED light for about five minutes.

NightStar is definitely full of interesting technology that you will want to share with your students (Fig. 1). The flashlight contains a magnetic repulsion system that repels the charging magnet back and forth through the charging coil. This repulsion system actually reflects, with minimum loss, the mechanical energy that you create each time you shake the device. As the charging magnet travels back and forth through the light's solenoid wire coil, it generates electricity. A high-energy capacitor then stores the generated electricity.

How it works. NightStar's on/off switch is made from a material that absorbs room- or sunlight. The material then glows in the dark, using the energy it absorbed when it was exposed to light. This switch and all other NightStar components have been designed to operate under very adverse conditions to water depths of 180 feet.

Once thrown, the Perma-glow switch completes the electric circuit sending electricity from the 5.5 capacitor to the white LED. LEDs have come a long way since they were used in displays on digital watches. Many laser printers and electrostatic copiers now use LEDs in place of lasers to create printed images. LEDs survive severe impacts, don't give off heat, use very little electricity, and usually last over 100,000 hours. White-light LEDs are so energy efficient that research and development labs are now exploring ways to use them to replace all present-day incandescent lighting systems.

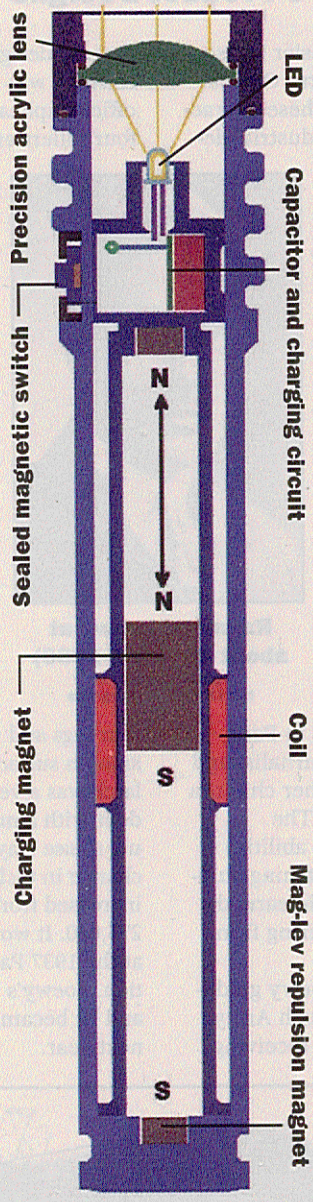

Fig. 1—NightStar components
Image courtesy of Applied Innovative Technologies, Inc.

Key features: High-brightness white-light LED · Magnetic charging system · Capacitor energy storage cell · Luminescent switch · Waterproof, lightweight, and high-impact resistant housing

Available soon. Even the case of this flashlight is special. It is made of the same polycarbonate used to make safety glasses and bulletproof glass. Since NightStar is made of such rugged materials, its manufacturer backs it up with a lifetime warranty, guaranteeing that it will work "in any environment on the planet."

Learn more about NightStar at **www.nightstar1.com**. Many technology learning activities may be developed around NightStar. I expect that you will soon be able to purchase it through many of the vendors that advertise in this magazine. td

Recalling the Facts

1. How does the NightStar flashlight create electricity?
2. Why does NightStar have a magnetic repulsion system?
3. Give four reasons why, in a NightStar flashlight, a white light LED is better than an incandescent light bulb.