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Recharging Electronic Devices with Ease

When you leave your home, even for a few hours, you probably carry at least one device that uses battery power to provide you with instant communication, entertainment, or fulfill some other 21st century need. I expect that every reader has experienced the frustration of running out of battery power at the worst possible moment.

The fear of a dead battery at an inconvenient time intensifies when you prepare to leave your home for an extended vacation. The packing process usually includes taking a recharger for each device that different family members wish to take on the trip. Even though the products you wish to take might require the same recharging voltage, it is unlikely that they will be able to share the same recharger because the power socket on each brand's unit usually requires a different-shaped plug.

You can't even rely on the same manufacturer to produce newer models that will share wires with their older siblings. For example, the Nintendo DS, DS Lite, and DSi each have power sockets that differ in shape.

Since we now live in the 21st century, you would expect that someone should have designed a technology that allows wireless charging of our electronic devices. A number of companies are now developing products based on a recent MIT breakthrough in resonant magnetic coupling.

The WiTricity (resonant magnetic coupling) future needs to include new infrastructure that will allow all battery-operated devices, from hearing aids to electric cars, to be recharged wirelessly by drawing power through the air from a nearby resonant magnetic coupling unit. Even though it will take years for this goal to be met, the Consumer Electronics Association (CEA) already has seen a need to launch a Wireless Charging Task Force to look into the creation

of a set of standards for this emerging technology.

At the 2009 Consumer Electronics Show (CES), I saw a very powerful demonstration of what WiTricity might look like in the very near future. The video (*CES Powermat Wirelessly*) was shot on the show floor and it demonstrates the WiTricity dream of an unplugged world. You can view it at www.powermat.com/technology.html.

Powermat is the first company to introduce WiTricity products that can actually transfer electrical energy from a mat to your electronic device without wires (Photo 1). You can see what I am going to describe in action at www.powermat.com. Unless the company experiences an unforeseen delay, its products will already be in stores by the time you read this column.

To charge a device on a Powermat, you need to connect your device to a receiver that can sit directly on the mat. This receiver will then automatically establish the needed resonant magnetic coupling for the transfer of energy. Powermat has developed protective cases with built-in receivers for some devices and replacement battery doors for others. The company plans to create many more in the near future and also intends to work with OEM manufacturers (original equipment manufacturers) to have receivers built into future products. In the interim, most electronic devices can be charged using Powermat's Powercube receiver, which attaches to your device through a short wire and an interchangeable tip that matches the receptacle on your device.

The Powermat reads the voltage requirements from your product and on the fly it adjusts the Powermat

output voltage to match. You can charge three devices, each with a different voltage requirement, at the same time. The section under each device will independently stop supplying electricity when its device is fully charged. WiTricity is new and a great deal of infrastructure still needs to be developed for it to meet its full potential. However, if products do ship on time, you can now start charging some of your electronic devices using a Powermat. I expect that by the time you read this column extra tip purchases and a tip finder will be available at the company's website.

If you analyze what you hate about meeting the power needs of your many different electronic devices, you will probably come to the conclusion that they run out of power just when you need them, and that they can't all plug into the same recharger.



Powermat

Photo 1—The first WiTricity wireless charging device

Energizer has a new, less high-tech, solution that also lets you recharge your electronic devices without a different wire for each product. Its Energi to Go product line has a lithium polymer rechargeable battery packaged with a recharging wire and an assortment of tips that are also designed to fit electronic devices. The Energizer system gives you a battery that can supply emergency power on the go and/or recharge different devices without OEM recharging wires.

Energizer has already developed

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a very extensive tip inventory that matches most electronic devices. It has also molded some of its lithium polymer batteries to fit a number of devices as a power boosting case (Photo 2). Energizer has batteries in this product line that physically vary in size, energy capacity, voltage outputs, and the number of devices that can be recharged at the same time (Photo 3).

Energizer's goal was to create a "battery fuel tank" that people can use to recharge devices while on the go. When the energy stored in the battery is exhausted, the user needs to recharge it by plugging it into a USB port or an electrical outlet. Each battery reads the voltage needs of a particular product and stops the recharging process when the device's battery is fully charged. Many of the batteries in the Energi to Go line can only charge one device at a time. Some can charge more than one device simultaneously and others



Photo 2—Energizer power boosting case

have different voltage outputs to cover a range from Bluetooth up to a power-hungry laptop. Energizer has designed the system to be idiot proof so that you can't connect an electronic device to a battery output terminal that will supply too high a voltage. If you do manage to get around this first line of protection, a chip in the batteries will cut off the flow of current



Energizer

Photo 3—This Energizer charger charges several devices at once

to prevent damage to the device.

You can check out the Energizer tip finder at www.xpalpower.com/us. The Energizer slogan is "free tips for life"—you just pay shipping and handling, which comes out to less than \$5 per tip if it doesn't limit quantities. I was disappointed to learn that the press

promotional unit that Energizer gave us at the press event included a 12 V car charger not included in the actual Energi to Go product line.

Recalling the Facts

1. If you needed to choose between the WiTricity and Energi to Go recharging systems, which would you choose? Why?
2. In the WiTricity product described in this column, how close does the receiver have to be to the Powermat for resonant magnetic coupling to take place? ☒

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