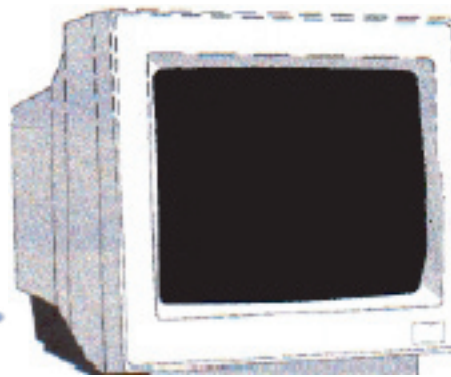


CVAUG Monitor



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A Word From the President

by Gregg McFarland

Okay, admittedly this month's presentation is not exactly Apple related, but before anyone starts yelling at me for my choice, let me tell you my angle. Apple has always been on the cutting edge of interface technology. The first Apple computer used a keyboard for

input and a monitor for output. Up until then the most common computers used on off switches for input and lights for output. Then came the Macintosh, its remarkable point and click interface was dazzling. The Nintendo Wii also has a revolutionary interface. It uses position sensing emote controls to interact with the interface and the games that has not been seen in a game system. So both Apple and Nintendo take advantage of exciting new technology to make their products a joy to use. That is why I thought a demonstration of the Nintendo Wii would make a good presentation for an Apple user group. Well... that, and the fact that it might be really cool to play some games on a huge projected video display.

160 Gb/s

by Wayne Younkins

IBM researchers demonstrated the world's fastest optical transceiver capable of speeds at least eight times faster than fiber optic components today. The research was partially funded by DARPA (Defense Advanced Research Project

Agency). According to IBM, "The transceiver is fast enough to reduce the download time for a typical high definition feature-length film to a single second compared to 30 minutes or more." Your tax dollars at work. For more information follow this link.

This Month:
**Nintendo Wii
Demonstration**

150 Mb/s Cable Modem

by Wayne Younkins

Faced with the competition of 50 Mb/s FiOS (Verizon Fiber Optic Service) modems, Comcast Cable demonstrated a 150 Mb/s cable modem which would be about 25 times the speed of current cable modems at National Cable and Telecommunications Association (NCTA). The system (DOCSIS 3.0) is not that different from today's cable modems and it could be implemented in a couple of years and for far less than fiber optic lines. It uses "channel bonding" where four cable TV channels are used together. (Which four TV channels would you like to give up? Send your ideas to your cable company.) For more information follow this link.

iPods can make Pacemakers miss a beat

by Wayne Younkins

A study of 100 heart patients of about 77 years of age with implanted pacemakers, showed that iPods can cause the devices to malfunction.

The study was conducted at the Thoracic and Cardiovascular Institute at Michigan State by Dr. Krit Jongnarangsin and Jay Thaker, a 17-year-old high school student who first raised the question that initiated the study. The study showed that an iPod held within 2 inches of the chest for 5 to 10 seconds, caused malfunctions in half the patients pacemakers. In some cases it caused interference at 18 inches.

The study did not test any other music devices.

For more information follow this link.

The Li-ion and the Sugar Battery

by Wayne Younkins

Remember not too long ago when laptop batteries were catching fire? Just about all laptop manufacturers had problems. It turned out to be metal burrs in some of lithium-ion batteries (Li-ion) made by Sony eventually shorted inside the battery causing fires. The fires were intense. On this link a fellow Mac user in Australia has pictures of the aftermath: <http://mactalk.com.au/forums/showthread.php?t=28926>.

Even now that these problem batteries have been recalled, there is a chance that a Li-ion fire could still occur, and the problem is not limited to just laptops. Cell phones also have had fires. According to a government report* from the Consumer Product Safety Commission, Lithium-ion batteries contain a lot of power in a very small package making them particularly prone to combustion and are sensitive to physical stress more so than alkaline types. So even if you have one of the good Li-ion batteries that were made properly, treat them with care. Li-ion chemistry is not safe as such, and a Li-ion cell requires several mandatory safety devices to be built in before it can be considered safe for use. These devices will permanently and irreversibly disable the cell but they also take up space, and add additional reliability problems.

These devices are:

A Shut-down separator which disconnects the battery due to over-temperature. A Tear-away tab which disables the battery subjected to overcharging that can cause internal pressure. A Vent to release gases caused by high current. A Thermal Interrupt to reduce battery temperature caused by either over-current, due to an external short, or overcharging due to a

malfunctioning charger or using the wrong charger). Also, the life expectancy of a Li-ion is determined by it's age and NOT by the number of charge/discharge cycles. Therefore, a Li-ion battery will loose capacity until it is useless by just sitting there. Typically, a fully charged Li-ion battery sitting on a shelf at room temperature will lose 20% of its capacity per year. This is irreversible. Sitting in a hotter environment such as a hot laptop is worse and its life is shortened even more if it is left sitting around less than full charged. The the best advice is to keep a Li-ion battery cool and full charged if you can. A Li-ion battery gives little sign of losing its capacity, they have been known to just stop suddenly one day.

Having been "burned" by Li-ion batteries, are there alternatives?

Looking only at practical choices for laptops we find that going back to Nickel-Cadmium batteries (NiCd) does not appear to be an option due to a worse capacity-to-weight ratio (three times worse than NiMH), charge/discharge cycles of only about 200 before performance starts to drop off, and the environmental problems when disposing of them. NiCd does have the advantage of a lower internal resistance and works well for motor applications where high current is required. Li-ion has a higher voltage than other batteries (about 3.6 V)

and the battery chemistry only loses 5% of this charge per month if left sitting around (the monitoring circuitry inside will use a little more). Nickel Metal Hydride (NiMH) loses 30% per month, and Nickel-Cadmium loses 10%. (Recently, there has been an improvement in NiMH shelf life and so they are packaged fully charged and ready to use just like an alkaline except that the voltage is lower at 1.2V.)

It looks like Li-ion is the way to go at present.

So far all practical batteries involve metal in inorganic combinations. Most involve the corrosion of a reactive metal except for Li-ion where an ion "moves". Lithium is the most reactive of the alkaline metals except for Sodium. It has a high electrochemical potential and one of the best energy-to-weight ratios which makes it good as a battery. The only hope for improved performance is using Chromium. But the effect quickly gives out with Chromium as the corrosion blocks any further reaction. But there may be another alternative on the horizon.

The Sugar Battery. Yes, you can make a battery out of sugar. And why not, our own bodies use sugar for energy. It just needs to be electric energy. Although the idea has been around a long time, the batteries did not last very long. Until now.

According to Shelley Minter, Ph.D., an electrochemist at Saint Louis University, "(The

device) demonstrates that by bridging biology and chemistry, we can build a better battery that's also cleaner for the environment." She claims that theirs is the longest lasting and most powerful yet and says that a postage stamp sized battery ran a handheld calculator. Like other fuel cells, the sugar battery contains enzymes that convert fuel - in this case, sugar - into electricity, leaving behind water as a main byproduct. But unlike other fuel cells, all of the materials used to build the sugar battery are biodegradable.

So far, Minter has run the batteries on glucose, flat sodas, sweetened drink mixes and tree sap, with promising results. She also tested carbonated beverages, but carbonation appears to weaken the fuel cell. The best fuel source tested so far is ordinary table sugar (sucrose) dissolved in water, she said.

By golly she may have this thing licked.

For more information follow this link.

Bluetooth, Wibree, and HID

by Wayne Younkins

Bluetooth provides short distance, low bit rate, wireless connectivity. Usually from say a keyboard or mouse to a computer, or from a cell phone to a handsfree device for driving. But there is a limitation. These devices need power and sizable batteries or batteries that are usually charged daily. What if the device was small like a wrist watch. Small devices use button batteries and don't have a lot of power. They could not use power hungry Bluetooth.

Nokia has introduced Wibree technology, a low power form of Bluetooth and you may see some of these devices come to market in the latter half of this year.

Wibree technology complements close range communication with Bluetooth like performance within 0-10 meter range and data rate of 1 Mbps. Wibree is optimized for applications requiring extremely low power consumption, small size and low cost. Wibree is implemented either as stand-alone chip or as Bluetooth-Wibree dual-mode chip. The small devices like watches and sports sensors will be based on stand-alone chip whereas Bluetooth devices will take benefit of the dual-mode solution, extending Bluetooth device connectivity to new range of smallest devices. Wibree devices may include

small toys that could be programmed at a distance, sports items for tracking your cycling performance. Remote controls and game accessories would not need wires. Your watch could synchronize with your computer for exact time and appointment schedules. HID*

devices such as running shoes that tell your computer how much you exercised today (or not!), so you can easily keep track of your progress without dull manual data entry, and healthcare monitoring equipment, and sensors in the form of Wibree stand-alone

devices can send vital health-related information (blood pressure, glucose level) to a monitoring device.
*HID-Human Interface Device.
Great, another anagram to remember.
