



Recovering Our Technical Literacy

by Vern Graner

I was lucky enough to be invited to join the *SERVO/N&V* crew in their booth at RoboGames 2007 in San Francisco, CA this year. Seeing so many kids at RoboGames involved with building, maintaining, or assisting with the creation of various technological disciplines was fascinating mostly because it was *unusual.* Interactions with kids in my home town has led me to believe that the average child in America is being trained (intentionally or inadvertently) to consume as opposed to create. If you look around, you too may see the evidence of this trend all around us.

No User Serviceable Parts Inside

The prevalence of pre-assembled, EULA protected, difficult-to-open devices has to be one of the most disheartening things about the exciting new technologies on the market. The "disposable" mentality marketed by big companies appears to have been firmly adopted by today's kids. Many of them have never seen someone actually *fix* a damaged piece of equipment! They didn't grow up in an era where you could bring a TV back to life through the simple replacement of a tube. I saw a kid on a camping trip throw away a flashlight when the bulb burned out. This Modus Operandi has been firmly entrenched: If it breaks, throw it away and buy another one. Though this approach may be good for business, it is very bad for the hobbyist.

Endangered Species

One thing that is sure to kill off a species is the erosion of its natural habitat. A hobbyist needs a place to "hobby." I first encountered the effect of this loss of workspace "habitat" a few years ago while working with my son's Cub Scout pack around the time of their Pinewood Derby. We had a number of kids that simply had no place to work on a car.

It follows that if there is no workbench available, then there is no chance of obtaining basic tool skills. Folks who live in apartments don't usually have garages and some folks that do have garages have them packed to the ceiling with "consumer debris" so there's no place to work even if they wanted to.

School's Out ... Forever?

While looking at schools in our area for my son, I was surprised and saddened to note the disappearance of technical arts from school curriculum. There were no offerings of wood or metal/machine shop. There were no electronics clubs or ham radio clubs. Even music was cut back to a bare minimum.

The apparent failure of schools and/or parents to provide a framework where a basic proficiency with common tools (i.e., soldering iron, hack saw, etc.) could be acquired has greatly contributed to "technical

illiteracy" from what I've seen. To help the kids in my son's pack who had no place to build, I sponsored a "Build Day" in my garage where we had all the tools needed to make a car. Not only did some of the kids not have access or experience with even the most basic hand tools (saw, drill, screwdrivers), I was astonished to realize I had to teach some kids how to use sandpaper!

You've Got Questions? We've Got ... Uh ... Cell Phones

Do you remember radio/TV repair shops? You know, the TV repairman who showed up at your door with a big box of tubes and a degaussing coil that made the picture dance with colors? How about the RadioShack of the 1970s and '80s that was bursting with all manner of electronic parts? Well, it appears all of these are things of the past.

RadioShack, which was once a place to buy all sorts of electronic parts and kits, is now mostly wall-to-wall cell phone accessories, home entertainment equipment, and other junk you could get at any big-box store. The well-stocked parts isles have shrunk to a small set of drawers hidden in the back of the store. (I can't even buy a copy of *Nuts & Volts* magazine there!) When I've pointed out this decline, employees usually say "we don't get much call for those things anymore."

Technophobia: The Next Generation

In the 1980s, I remember hearing the term “technophobia” being used to describe the fear some people had of the new computer technologies that were just starting to invade homes and workplaces. People who didn’t understand technology were reluctant to accept these “new-fangled devices” into their lives. In most cases, the fear was fueled by a lack of knowledge. I feel we are stepping into a new, more dangerous era of technophobia, fueled by that very same lack of knowledge and familiarity.

In January of this year, Boston police misidentified some advertising signs as bombs. In defending their actions, I was horrified when I saw this quote:

“The device had a very sinister appearance. It had a battery behind it, and wires.”

— Massachusetts Attorney General
Martha Coakley

When did “batteries and wires” become “sinister?” How could it be that the bread and butter of the electronics hobbyist could be portrayed in this light? Has our hobby fallen so far below the radar that even “trained professionals” might confuse the components of a typical hobby kit (LEDs, batteries, wires, and a printed circuit board) as a terrorist device? I can’t help but wonder that if the authorities in Boston had built a few Heath kits, would they have jumped to these conclusions so quickly?

Only Limited by Your Imagination

Imagination requires nourishment to live and grow. If everything is pre-planned, then there’s no room for imaginations to get any exercise. A good example is regular “consumer” LEGO kits (not the Mindstorms series). Many of the kits offered for sale in the big-box stores have become more like jigsaw puzzles with parts that are one-purpose and only

designed to go together one way (i.e., a pirate ship).

Can We Fix It? Yes We Can!

It’s pretty clear to me that this is a trend that can be reversed and I think it falls to us (the creators and fixers of things) to change it. Here’s a few ideas on how to start:

To the Internet!

Point people in the direction of online resources. Though we’ve seen a precipitous decline in printed support for our hobby, the Internet is loaded with interesting and inspiring websites. Have a look at:

Nuts & Volts online
www.nutsvolts.com

SERVO online
www.servomagazine.com

FIRST LEGO League
www.firstlegoleague.org

BEST
www.bestinc.org

Hackaday
www.hackaday.com

Instructables
www.instructables.com

Evilmadscientist
www.evilmadscientist.com

Hackedgadgets
<http://hackedgadgets.com>

Craigs list
www.craigslist.org/

Freecycle
www.freecycle.org

If you don’t want to test your skills on known working equipment, find some free “experimentables” (old printers, computers, boomboxes, etc.) on Craigs list or Freecycle and tear them apart just to see how they work.

Tools — The Gift That Really Keeps on Giving

We all have friends, relatives,

co-workers, and the like that have birthdays, graduations, or other celebrations where a gift would be appropriate. Instead of grabbing another battery gobbling, blister-packed throw-away consumer device, why not give the gift of TOOLS? A small socket set, a volt meter, a soldering iron; many of these are available for very low cost from the pages of this very magazine. Tools give them the ability to get inside things, see how they tick. If budget allows, maybe even include a small electronics kit to be assembled.

Sabotage!

Make a challenge gift. Have a look around your shop and find a small working radio or tape player (there’s probably a few of those if you’re anything like me!). Open it up and make a small change that is easy to diagnose and repair (i.e., disconnect one speaker wire, intentionally “pop” a fuse, etc.). Then, give the device and a small tool kit to someone. Tell them the device can be repaired with a bit of investigation. Offer to help.

Recycle Your Knowledge!

I’ve often left old issues of *Nuts & Volts* and *SERVO Magazine* at schools, libraries, dentists offices, lobbies of hotels, etc. Being as how I have all the issues in digital format now (You *do* have all the issues on CD-ROM now too, right?), I can leave the paper versions around like seeds. Play “Johnny AppleVolts” in your area. You never know who will pick up an old copy and become inspired.

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If you have any ideas, success stories, or other comments, please feel free to share them with me and send them to my email address at vern@txis.com. **SV**