

# Embedded Systems: Kits for Kids

Jon Titus, Senior Technical Editor

[Kits for Kids](#)

**by Jon Titus, Senior Technical Editor**



I'll begin this column with a recommendation: Start kits with a set of basic hand tools. When my son went to college, he had tools to hang pictures, connect TV sets and CD players, and tighten desks and shelves. As a result, he met most of the people on his co-ed floor. When our daughter went to college she got a tool kit, too. I suggest Phillips and flat-blade screwdrivers, pliers, diagonal cutters, wire strippers and a couple of adjustable wrenches. Later you could add a set of nut drivers, sockets wrenches and an inexpensive soldering iron.

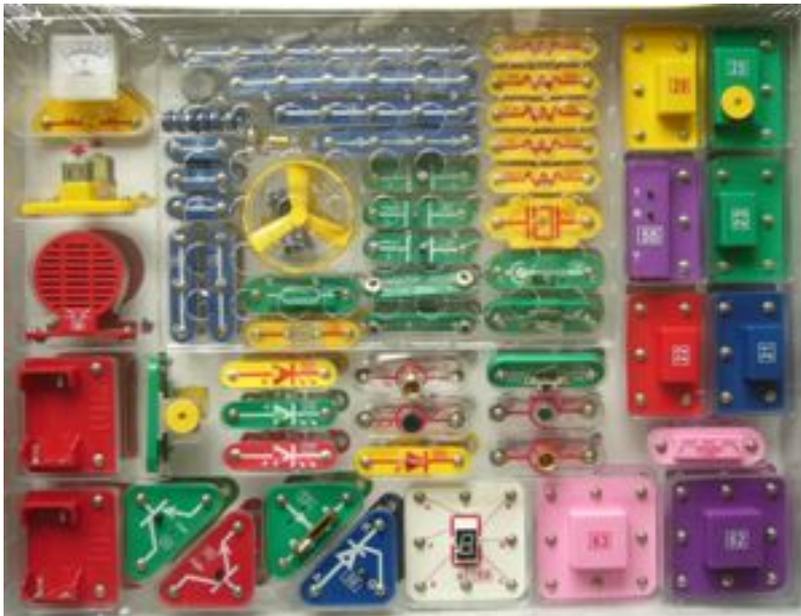
Now on to new kits: Bill Jenkins has updated his Tech8 Web site ([www.tech8.ca](http://www.tech8.ca)) that shows the small electronic kits and circuit boards his company offers. He recently added a Winker "Robot" PCB. Bill's site also links to eLabtronics information about Microchip PIC projects for young people who have support from adults with some technical experience. After youngsters complete a project they can click a button and export a schematic to EZRoute2000, a PCB layout program. If they want prototype boards, many short-run PCB houses can produce them from the EZRoute2000 files.

While looking for new kits, I found the Zeus Mercantile Web site ([www.zeusmercantile.com](http://www.zeusmercantile.com) [1]) that shows three BrainBox electronic learning stations. (Click BrainBox under CATEGORIES.) Chris Taylor, the owner works as a mechanical engineer and imports the kits that let youngsters easily and quickly construct circuits. Chris noted, "San Juan College in New Mexico has used the smaller kits in a summer program for kids and I have used them to demonstrate basic electronic principles to my nieces. The one flaw the kits have is the manu

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al. Color-coded instructions makes it easy to build circuits, but the manuals lack an explanation of what goes on in a circuit or how to apply the circuit in practical devices. I don't think you could hand a kit to a youngster and expect them to pick up fundamentals of electronics on their own."

Chris also noted the XGameStation Web site ([www.xgamestation.com](http://www.xgamestation.com) [2]) as a source of electronic-game boards and consoles for advanced experimenters, so I contacted Andre Lemothe, the company's CEO. He explained that the company's MACH64 product is a hands-on "learn by doing" kit for teenagers who can follow instructions about how to connect wires for each of the labs and compile and download programs. The kit starts with a blinking LED and ends with the skeleton of a Pong-like game on the board's CPLD. Lamothe said, "Some of the theory might go over the kids' heads. But when I was five or six and got my first electronics kit from Radio Shack and built an oscillator circuit, I didn't understand the criteria for oscillation, feedback and so on. I just built the circuit and had a lot of fun." Teenagers and adults needs to understand that the MACH64 kit will teach them about configurable or programmable logic. If they like that objective, then this is a great kit, which comes with a 250-page manual.

[www.xgamestation.com/products/mach64kit/downloads/MACH64\\_Manual\\_Sample\\_v1\\_0.pdf](http://www.xgamestation.com/products/mach64kit/downloads/MACH64_Manual_Sample_v1_0.pdf) [3]

MadLabs in Scotland offers a variety of simpler kits, graded for beginner, intermediate and advanced experimenters. James Hutchby of MadLabs sent along an email to explain that Apogee Kits ([www.apogeekits.com](http://www.apogeekits.com) [4]) in Texas sells many of the MadLabs kits in the US. Apogee also sells soldering tools and a few non-electronic products. It's worth your time to visit the company's Web site.

Richard Arndt, a long-time engineer, told me he still enjoys the aroma of melting solder and the warmth of a glowing vacuum tube. And he suggested readers take a look at "Silicon Chip," an Australian magazine ([www.siliconchip.com.au](http://www.siliconchip.com.au) [5]) that described many interesting electronic projects. A subscription costs about \$US 63 per year. Arndt said, "Silicon Chip has partnered with AutoSpeed Magazine to

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develop a number of kits for auto enthusiasts. My son and I are using the DIY ECU MegaSquirt II ([www.megamanual.com](http://www.megamanual.com) [6]) from on a Volvo and a turbo'ed 5.0 Mustang, so we have learned quite a bit about engine management." Arndt also said, "I can't think of a better way to trigger the creative minds of our children than with educational kits."

Youngsters and parents may have heard of the First LEGO League (FLL), an international hands-on and interactive robotics program for kids from nine to 14. James Floyd Kelly and Jonathan Daudelin note that FLL is a kind of geek Olympics that combines a sporting event and science fair. But, FLL is not meant as a simple competition, and fielding a team requires some serious management and plenty of work, so they wrote a new book, "FIRST LEGO League: The Unofficial Guide," published by No Starch Press, (ISBN 9781593271855). The book offers participants some guidance as they create and manage a team. Sounds like a project that requires some adult participation.

Lego--the company--has a new WeDo package available for kids in elementary schools. I've written about this kit elsewhere and won't duplicate information here. Visit: [www.dev-monkey.com/blogs/jon\\_titus.php?mid=324](http://www.dev-monkey.com/blogs/jon_titus.php?mid=324) [7]

*If we missed companies, materials, courses and other information you think would help kids develop an interest in engineering, send information to: [jontitus@comcast.net](mailto:jontitus@comcast.net) [8].*

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### Links:

[1] <http://www.zeusmercantile.com/>

[2] <http://www.xgamestation.com/>

[3] [http://www.xgamestation.com/products/mach64kit/downloads/MACH64\\_Manual\\_Sample\\_v1\\_0.pdf](http://www.xgamestation.com/products/mach64kit/downloads/MACH64_Manual_Sample_v1_0.pdf)

[4] <http://www.apogeekits.com/>

[5] <http://www.siliconchip.com.au/>

[6] <http://www.megamanual.com/>

[7] [http://www.dev-monkey.com/blogs/jon\\_titus.php?mid=324](http://www.dev-monkey.com/blogs/jon_titus.php?mid=324)

[8] <mailto:jontitus@comcast.net>