

Kits for Kids

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As a youngster I enjoyed wiring up circuits with knife switches, lamps, buzzers and large dry cells. While in high school I made frequent trips to surplus-electronics stores in New York City and ordered components from mail-order supply houses. My projects included a 4-bit binary adder -- built from switches and relays -- and a tic-tac-toe machine. I also built my share of kits from Knight, Eico and Heath. My friend Bill Kuhn designed and built relay-logic learning machines. We had no tutorial material and learned by making up our own experiments and making lots of mistakes.

Some engineers have told me electronics is a dead hobby and these days kids have little interest in how things work. So, I wondered what types of materials exist for kids in whom we might kindle an interest in electronics. I found many sources and feel strongly that some kids will enjoy experimenting with circuits and software on their own or with some adult supervision and guidance. Today's young experimenters can build kits, use a microcontroller development kit, experiment with a 100-in-one lab and breadboard their own circuits.

I started my search at Parallax, the company that pioneered the Basic Stamp computer modules. The company offers many kits and projects that include a three-wheel BoeBot kit, a tank-tread kit and a crawler kit. In particular, the BoeBot seemed like a good project for a teenager to tackle. Parallax sent me a kit and my 14-year-old neighbor, Chris, volunteered to help. To gauge the difficulty in putting together the BoeBot, I had Chris jump right into Chapter 3 in the accompanying 345-page manual and follow the assembly instructions. Chris took about an hour to get the parts together using simple hand tools and without much assistance. He liked the clear instructions and illustrations.

After constructing the BoeBot, we loaded the Basic Stamp Editor and typed in programs that tested the servo motors and a buzzer. That's as far as we got in one session. Parallax notes running all the experiments in the manual can take about 50 hours. In practice, beginners should start at Chapter 1 and go through preliminary experiments and lessons before they start to assemble the robot. (Optional displays, sensors and wireless modules expand the kit's capabilities.) The package seems well suited for a teenager who can learn a lot with a bit of adult help. This kit also lets youngsters try their own programs as they master Basic commands. Parallax supplies excellent tutorial information.



Chris enjoyed building the BoeBot, and I gave him a Scribbler Robot (www.scribblorobot.com [1]) in return for his efforts. The Scribbler provides a nice introduction to robots, but without the need to assemble anything. Kids can program robot actions in several ways from a PC.

If you want to start on a smaller scale, you will find a wide variety of hobbyist and experimenter kits at Ramsey Electronics (www.ramseykits.com [2]). Digital clocks, ultrasonic range finders and amplifiers present challenges for youngsters who end up with something they can show their friends. Ramsey also offers advanced kits such as a shortwave radio, an aircraft-band receiver, and a model-rocket transmitter. The company posts many manuals so kids and parents can determine the skills needed to assemble a kit.

Jameco Electronics (www.jameco.com [3]), a supplier of electronic components, offers several kits that will appeal to experienced kit builders or experimenters with some electronics knowledge. The company also sells a variety of breadboards so young experimenters can wire up and test their own circuits after they know some of the basics of electricity. Parents with engineering experience can suggest simple experiments with TTL ICs and basic analog components. If you start a youngster down the DIY road, I suggest you begin with battery power, say a 6V lantern battery with a series diode for 5V TTL circuits and 9V "transistor-radio" batteries for analog circuits.

Young people interested in programming small computers and seeing them do real things, can start with a variety of products, from the Basic Stamp modules mentioned above to evaluation boards available from microcontroller-chip vendors. The PICkit starter boards from Microchip Technology (www.microchip.com [4]), for example, come with tutorials.

To go farther, look at Nuts and Volts (www.nutsvolts.com [5]), a monthly magazine that publishes many experimenter and hobbyist projects. The monthly magazine Servo (www.servomagazine.com [6]) and the quarterly Robot magazine

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Published on Electronic Component News (<http://www.ecnmag.com>)

(www.botmagazine.com [7]) concentrate on robot and mechatronics projects. Advertisers provide a variety of products for hobbyists of all types.

Amateur radio can introduce youngsters to communications and the hobby involves all aspects electronics. Local ham-radio clubs offer courses and administer multiple-choice exams, which no longer require a Morse-code test.

If you have ideas for ways to interest kids in electronics, engineering or science, please send them along. If you uncover other resources or sources of materials and supplies, drop me a note at jontitus@comcast.net [8].

For further reading

"The ARRL Handbook for Radio Communications, 2007," American Radio Relay League. ISBN 0-87259-976-0. www.arrl.org [9]. Lots of practical electronics information.

McComb, Gordon and Earl Boysen, "Electronics for Dummies," Wiley Publishing, Inc. www.dummies.com [10]. A good introduction for hobbyists and experimenters.

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Links:

- [1] <http://www.scribblerrobot.com/>
- [2] <http://www.ramseykits.com/>
- [3] <http://www.jameco.com/>
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