Hacker spaces offer havens for quirky ingenuity

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In a cluttered fifth-floor studio in North Philadelphia, two huge pieces of plywood hang from the ceiling, pulsing in time with the music from a pair of high-end stereo speakers.

Thoompa-thoomp-thoomp ...

But upon closer inspection, the big pieces of plywood actually are the speakers. They have wires attached to the back, and, somehow, they sound really good.

Typical for Hive76. It is a hacker space, a kind of inventors' clubhouse where castoff 21st-century junk and random parts are fused together in a collaborative cauldron of ideas. Members share tools, electronics equipment, and expertise at the studio, dropping by at any hour of the day to turn what-ifs into why-nots.

So when Louis Gerbarg kept losing his keys? No problem. He and a friend sought advice from members of Hive76 and whipped up an electronic key-finder operated through an iPhone app.

And Robert Vlacich? He hated the jolt of his alarm clock on dark winter mornings, so he wired up two circuit boards in order to wake up gently. His device mimics sunrise by gradually turning on a series of 150-watt lightbulbs.

If you thought the term hacker referred only to someone comfortable

navigating through the back doors of a computer, it's time for a vocab reboot. Broadly, it means anyone who takes a do-it-yourself approach to technology - hardware, software, audio, video.

There are several hacker spaces in the city, and many dozens of such places have popped up across the country in recent years. This month, students at the University of Pennsylvania will host a competition called PennApps, billed as the largest student-run hack-athon in the country.

All this activity has been spurred, in part, by the advent of low-cost tools such as programmable circuit boards and 3-D printers - devices that can spit out any three-dimensional object by "printing" layer after layer of plastic. Another key driver is the [free exchange](#) of ideas and plans on the Internet. Hackers may have a commercial product in mind, though often projects are strictly for personal use, or for the fun of teaching a lot of people how to do something cool. Like the plywood speakers, which radiate sound thanks to the tactile transducers attached to their backs.

Hive76 member Brendan Schrader, 31, the brains behind those speakers, follows a simple code:

"If it's fun and stupid, I build it," he said.

To get in the building that houses Hive76, regular people have to type in a door-entry code. But members can buzz themselves in with a computerized key-fob system that was built, naturally, by Hive76er P.J. Santoro.

Inside the rented studio, the decor might best be described as haphazard post-industrial chic. Vintage video-game consoles line one wall. A row of shelves contains soldering irons, an oscilloscope, boxes of capacitors, and other electronic components.

A scrap of handmade chain-mail is pinned to a bulletin board. Perhaps a remnant from a medieval war re-enactment? No one can remember who put it there. Alongside it is a plastic bag full of wine-bottle corks labeled "emergency corks," with no apparent purpose.

"You can never have too much cork," joked group member Jordan Miller, a biomedical engineer at the University of Pennsylvania.

A key reason for having a communal space is to accommodate equipment that would not fit in a typical apartment. Such as a band saw, which a Hive76 member found on a sidewalk, a drill press, and several 3-D printers.

"I can make a huge mess and I don't have to worry about getting stains on the carpet," said Schrader, a theatrical sound designer.

NextFab Studio, a much larger hacker workshop in Philadelphia, has even more stuff: laser cutters, computer-controlled routers and a digital embroidery machine, among other gadgets. It is more than a hacker space, with a for-profit model in which staff members produce manufacturing prototypes on a contract basis.

But a space is more than its equipment. Even more helpful is the shared expertise, said Chris Thompson, a self-described digital artist who belongs to Hive76. In that group, Schrader is the go-to guy for audio stuff, whereas Miller and Thompson are big on 3-D printers. Others are strong at programming.

There is a range of types in Hive76, from shy nonconformist to hipster cool. But none would flinch at the label "geek," a term reclaimed long ago from the ranks of insults.

Membership fees are $50 or $100 a month, depending on the amount of

storage space you want. A "dismember" - someone with limited access - pays just $15.

As in many hacker spaces, most of the 20-odd members are men.

That's an issue that has drawn the attention of Georgia Guthrie, executive director of another Philadelphia group, the Hacktory. In April, she helped organize a workshop called "Hacking the Gender Gap" at a Women in Tech Summit. Sometimes women may feel intimidated at a hacker space if the other members are too engrossed in their projects, said Guthrie, who last month won "Hacker of the Year" at the annual Philly Geek Awards.

"We greet everyone, try to ask what they're interested in, and make it clear that any question is welcome," Guthrie said of the Hacktory.

Questions are clearly welcome at Hive76, where on one recent evening, Vlacich helped a fellow member tweak a home hydraulics kit he had made from garden hose and PVC pipe.

Gerbarg, the guy who developed the electronic key-finder with business partner Geoff Litwack, also made use of the communal expertise. The two are software guys but did not know much about plastics. Yet sure enough, there was a Hive76 member who gave them helpful tips on manufacturing.

The key finder is called Hone, which they are in the midst of commercializing with support from the funding site Kickstarter.

Vlacich, meanwhile, is keeping his light-based alarm clock for himself. If he tried to sell it, he said, "it would just get cloned out of Asia."

In addition to making new products, Hive76ers also fix old stuff that

would otherwise get thrown out. Schrader, the audiophile, often goes on rants about the wastefulness of modern society.

He recently took apart a broken plasma TV that had been donated by an art gallery and checked the voltages. He soon had it working as good as new by simply replacing a capacitor - at a cost of 10 cents.

Hardly the work of a hack.

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