

# The Golden Age of Hacking

By Joan Killough-Miller  
Illustrations by Carla Ventresca



PATRICK O'CONNOR

In the 1970s, a small band of WPI students got turned on by something new and revolutionary and went underground. There, these zealots spent huge amounts of time, out of the public eye, pursuing their radical interests. But these were not your typical revolutionaries. The "underground" they practically lived in was the windowless bottom floor of Gordon Library, home then to WACCC, the Worcester Area College Computational Center. And the novelty to which they were irresistibly drawn was the world of mainframe computers—including the Digital Equipment Corp. PDP-10, on which many of these early hackers cut their computing teeth.

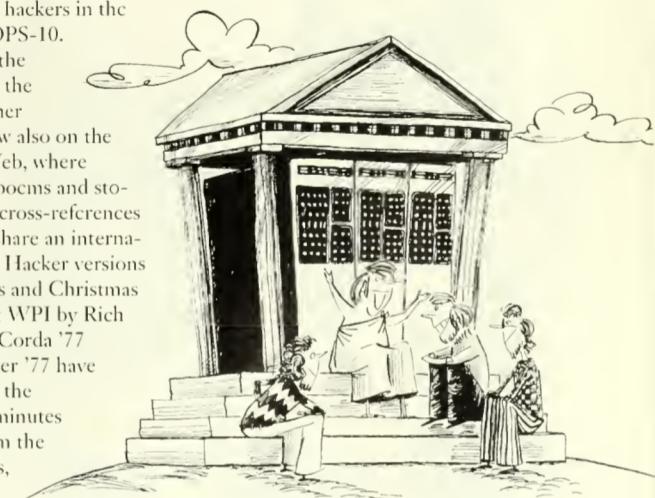
**B**ut don't mistake these hackers for "crackers," the modern-day miscreants who worm their way into computers, hoping for a crack in the program code that will let them commit evil deeds. Nothing angers a true hacker more than being confused with these cybercriminals. Back in the "golden age of hacking," the passion for programming was more innocent.

Devotees of the PDP-10 swallowed its TOPS-10 instruction set whole, and spent every free moment (and often entire nights and weekends) clustered around a console. Hacker communities were evolving at colleges across the country and developing a distinctive jargon and culture that was transmitted over ARPANET, the predecessor of the Internet. Although WPI was not connected to this early network, the campus was still a reputable stronghold of hacker culture in the '70s, supporting a cast of eccentric characters who had their own heroes (and anti-heroes), a local dialect, and even epic literature.

"We were a self-respecting crew—a complete community on our own," says Andy Tannenbaum '78, a system architect with CableSoft Corporation in Burlington, Vt., who manages the "WPI Hackers of the '70s" site on the World Wide Web ([www.wpi.edu/~trb/hacker70s.html](http://www.wpi.edu/~trb/hacker70s.html)). "We had something the bigger schools didn't. At WPI, undergraduates had free, unlimited access to time-sharing. That was unheard of at most schools. It made us free to explore and experiment, regardless of our course of study."

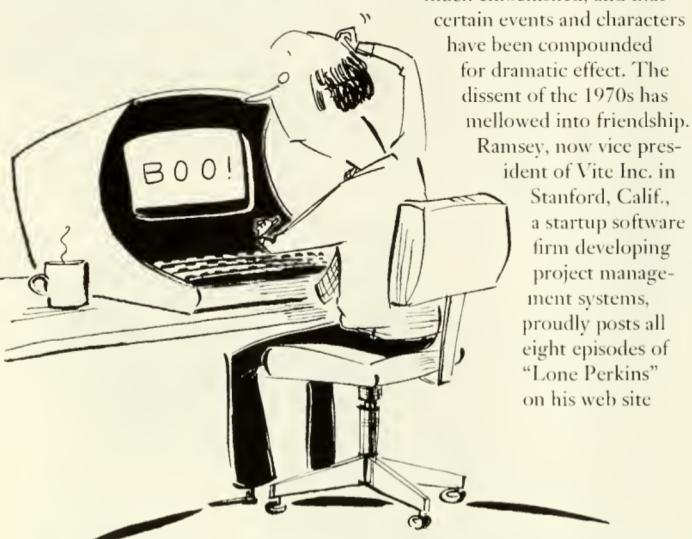
In fact, most of the exploration went on outside of courses in computer science, which hackers studied for background, but rarely as a major. "You learned as much sitting around the table in the cafeteria as you did in classes," Tannenbaum recalls. "It was like ancient Greek times, when Socrates would talk and his disciples would sit and listen, only Socrates was Greg Walsh." Walsh, a member of the Class of 1976, is a founding member of Epiphany Marketing Software in Mountain View, Calif. He is remembered as a quiet but talented engineer who had a genius for hacking everything he touched, from telephones to car transmissions. It was an accepting, unselfish community, with mentors like Rich Rupp '78, now an executive with Donnelley Enterprise Solutions Inc., who wrote a program called "Lesson" to initiate younger hackers in the mysteries of TOPS-10.

Legends of the elders live on in the memories of other hackers, and now also on the World Wide Web, where hacker ballads, poems and stories (often with cross-references and glossaries) share an international audience. Hacker versions of popular songs and Christmas carols written at WPI by Rich Holmes '77, Al Corda '77 and David Kinder '77 have traveled around the world. Within minutes of a request from the *Journal*, Holmes,



Opposite, clockwise from top left, with memorabilia from the DEC 10, are Andy Tannenbaum '78, Harley Privitera '76, Al Johannesen '68 and Greg Walsh '76. Walsh, a hacker's hacker, was a mentor to many students (above). "It was like ancient Greek times, when Socrates would talk and his disciples would listen. Only Socrates was Greg Walsh."

**A common prank was to leave a bit of graffiti, altering a corporation's welcome screen in some silly way. The hackers looked on this as providing a free service—warning system managers to improve security.**



([www.ranlog.com/ramsey/lp.html](http://www.ranlog.com/ramsey/lp.html)), and joins the hackers for WACCC Night when business brings him to the East Coast.

Although hacking, by definition, means going beyond the established order, a hacker ethic of integrity and cooperation prevailed in the 1970s, according to Megan Gentry '79, now a senior software engineer for Digital Equipment Corporation, where she worked during her last two years at WPI as a DECsystem-10 operator. "Many people tried to subvert the protections on the system

now a graduate student at the University of Maryland, was able to locate and download some favorites from a web site in Germany, including "Magtapes Roasting on a Open Fire," "Away in QMANGR," and "The Twelve Days of Uptime."

The trio's epic work, "The Adventures of the Lone Perkins," captures the spirit of the times in a takeoff on the old "Lone Ranger" radio drama. "Lone Perkins" refers to Ed Perkins '72, a former manager of operations at WACCC who is now a software engineer with Integrated Measurement Systems Inc. in Beaverton, Ore. Al Johannesen '68 also appears as "Joe Hansen." Johannesen, who remains at WPI as Managing Senior UNIX System Administrator, is considered a "spiritual father" by several generations of hackers who worked under him at WACCC (see story, page 16). Once an intimidating authority figure who doled out additional disk allocation only to deserving students, he now holds the family together by hosting a weekly hacker happy hour called WACCC Night.

The arch villain of the Lone Perkins saga was Marc Ramsey, or "The Great Ramsey." Ramsey, who was actually expelled from WPI as a freshman (temporarily, it turns out) for overzealous hacking that crossed the border into cracking, is quick to point out that the Lone Perkins story is much embellished, and that certain events and characters have been compounded for dramatic effect. The dissent of the 1970s has mellowed into friendship.

Ramsey, now vice president of Vite Inc. in Stanford, Calif., a startup software firm developing project management systems, proudly posts all eight episodes of "Lone Perkins" on his web site

in order to log out over quota [students were allocated a measly 100 blocks of disk space]," she recalls. "Some succeeded, including myself. I like to think that those who typified the hacker ethic were the ones who reported how they did it, so that it could be corrected." [WPI was, at that time, a test site for Digital's TOPS-10 operating system.]

This didn't stop hackers from breaking into computers at other colleges and corporations in nondestructive ways. A common prank was to leave a bit of graffiti—for example, altering a corporation's welcome screen in some silly way. The hackers looked on this as providing a free service—warning system managers to improve security.

"The fun thing for us wasn't so much breaking in, but figuring out cool, new ways to break in," says Tannenbaum. "If you break in with stolen passwords, without understanding *how* you did it...that's sort of like filling in a crossword puzzle when you have the answers in front of you, or picking a lock with a key that someone copied for you." Tannenbaum contends that this lock-picking was actually good career preparation—especially for those who now write security systems.

The WACCC denizens took time to play, but even everyday games like hide-and-seek involved computers. A small hacker could hide inside the drum cabinet of the RCA Spectra, or in the mysterious "WACCC hole." Greg Scott admits that he rigged the game with an impromptu program that illuminated the PDP-10's banks of status lights when it was his turn to seek, and darkened the room as much as possible when it was his turn to hide. Other pastimes included trying to spell out derogatory messages on the status light display, replacing the notice.txt (daily messages) file with something spicier, and of course, trying to seize control of the system through any means possible. Standard punishment for getting caught was being "canned"—having your user account canceled.

Because computer courses were not required, and computer literacy wasn't a prerequisite for anything in the early 1970s, those who played with computers did it for love, not riches. "You weren't going to make your million in programming in those days," Tannenbaum laughs. "We hackers were pretty low on the engineering totem pole. Of course, every last one of those engineers in 'respectable' fields ended up becoming a slave to computers, so we hackers got the last laugh!"

Was it really the golden age? Every group that passes though WPI feels nostalgia for the good old days, but Johannesen, a veteran of three decades of change, says there are some factors that made the hacker's work in the 1970s more rigorous and more rewarding.

"Today's computer software is distributed on CDs, in an unchangeable binary form. Dealing

with the system is just a matter of pointing a mouse and clicking on a fixed list of options. If something goes wrong, all you can do is scratch your head," he says. But in the days of the PDP-10, Digital also distributed the source code for its software, which meant that programs could be altered.

Under Johannesen, a corps of work-study students tinkered with the campus's central academic and research computer—a heady responsibility for mere students. Their modifications allowed WPI to support its entire student body and much of its staff—up to 50 users at a time—on the modest capacity of a single PDP-10. "We ran the PDP-10 for eight years, a ridiculously long time by today's standards," Johannesen says. "By the time that computer was removed from WPI, maybe as much as 50 percent of the software had been customized." He adds that the students were working directly in assembly language, a challenge that is now pretty much extinct. These days, most programmers work in higher-level languages, such as C.

As the computer age evolves, affordable hardware with ample memory makes life easier for programmers and users. But in the 1970s, the high cost of core memory demanded tight programming, in which every character counts. "Back then," recalls Tannenbaum, "if a computer program could be modified to run faster, thus making it cheaper to use, it didn't really matter how it treated the person." Programmers were expendable—cheap labor, indefatigable John Henrys, who worked with their hands, so to speak.

Eric Hahn '80, known as a crackerjack programmer and entrepreneur even in his student days, agrees. "It was a different era," says Hahn, who in 1995 sold his successful software company, Collabra Software Inc., to Netscape Communications Inc., where he is now senior vice president for enterprise technologies. "The tools were far more crude and esoteric. Modern PC software is neat, very neat—but also quite antiseptic." Some hackers of the '70s generation are encouraged by the development of the Web, where they find innovation, after a lackluster period of uninspiring computing. The Web also plays an important role in keeping alive hacker history and culture, and in sustaining the friendships forged at WACCC two decades ago.

"It was our software fraternity," says Tannenbaum, who points out that the group's loyalty has endured without any official organization or campus affiliation. More than 100 people from all over the country flocked to Worcester for a hacker reunion held at the Mandarin Room of the Sheraton-Lincoln Inn in 1981. These days, the locals—many of whom now staff WPI's College Computer Center in Fuller Labs—still gather with Johannesen on WACCC Night at watering holes around Worcester County. Those who have migrated to the Silicon Valley and other parts of the world drop by on occasion, to tip a brew with comrades in memory of the golden age of hacking at WPI.

**Even everyday games like hide-and-seek involved computers. A small hacker could hide inside the drum cabinet of the RCA Spectra, or in the mysterious "WACCC hole."**

