

# **Remembering The HP Corvallis Calculator Brainstorming Team**

HP Measure Article from July – August 1991 Issue

# Remembering The HP Corvallis Calculator Brainstorming Team

*Richard J. Nelson*

The HP-41 calculator represented the greatest HP accomplishment in establishing the “connection” between an HP machine and the greatest variety of users. The HP-41 inspired an especially wide range of users from engineers, technologists, and professionals, to students. The User Community “officially” met Bill Wickes at HHC 1980 in Rolling Meadows IL. Community leaders also met with Bill, HP managers, and other “hackers” the following year during a special meeting before the 1981 Conference to discuss the subject of Private. HP was recoiling from the fact that Private was easily broken and they were internally discussing a policy change to exclude program protection in future models. PPC and user community leaders had gathered to convince HP not to change their policy.

Bill Wickes was soon offered a job at HP and he joined the Corvallis Calculator Team as described in the Measure magazine article that follows. Measure was published six times a year for employees and associates of Hewlett-Packard Company from 1963 to 1991 so this issue was one of their last. It was produced by HP Corporate Communications, Employee Communications Department, Mary Anne Easley, manager. It was a special honor to have an HP employee written up in this magazine.

Members of the HP Calculator User’s Community remember Bill for his many books. The first was dedicated to Synthetic programming on the HP-41 followed by others. He later wrote a trilogy of books that spanned the old RPN to the new, truer RPN, called RPL.

Bill still works for HP in his current position as an R&D manager for Halo. He says that he has now worked on the smallest HP consumer product (calculators) and on the largest HP consumer product, Halo. Halo is so large that the consumer actually fits inside the product. Halo customers include many Fortune 500 companies. You may find additional information about Bill, Halo, and the site we will be having our HHC 2007 Conference at:

<http://www.signonsandiego.com/news/business/20060407-9999-1b7hp.html>

Most serious HP Calculator users are familiar with Bill's brilliant contribution to post 41 machines and his ideas are obvious in the current versions of the HP 48/49/50 models.

The article that follows shows some members of his Development team. Diana Byrne has left HP, but many of the team is still working for HP, but not on calculators.

The article is a Measure cover story and many HHC 2007 attendees will remember the setting of the cover photograph because we held three HHC’s in Corvallis: 1981 and 1988. The third one was August 1991, the same date as on the Cover.

Conference Attendees will remember Diana Byrne’s presentation at HHC 1995. She described the global nature of the business with many of her team located in Singapore. Diana attended other HHC’s and she has also had a significant impact on calculators.

The article mentions Bill's kids, all grown now, and they were directly “inspirational” for some of his most calculator recent books. Sending them to college was much easier using the earnings he made from Larken Publications - read the article and note the names of his daughter and son.

Many of HP’s customers learned RPL from his *HP41/HP48 Transitions* book.

*For the people of Hewlett-Packard*

*July-August 1991*

# MEASURE

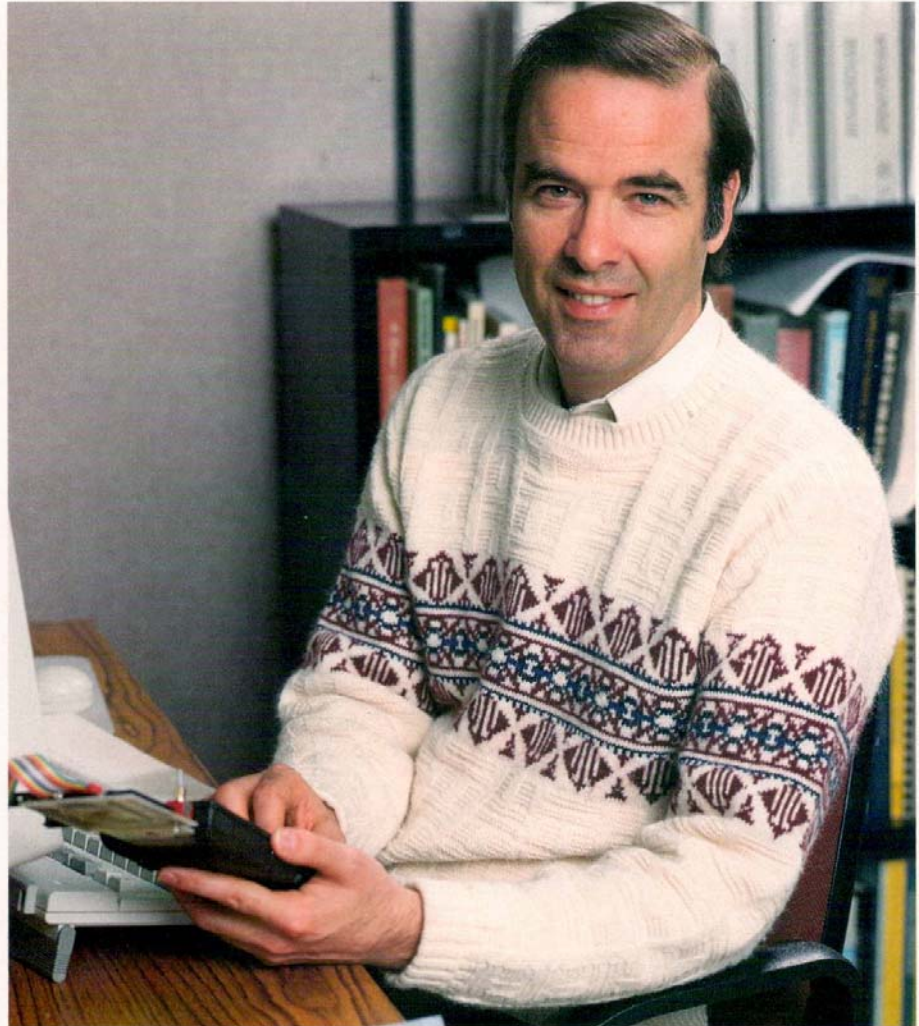


Brainstorming  
in Corvallis

# It all adds up

By Jay Coleman

A one-time "outlaw" joins HP and becomes the father of scientific handheld calculators.



It takes a love of puzzle-solving and "a warped mind" to design HP's current crop of best-selling scientific calculators, says Corvallis (Oregon) Division's R&D project manager Bill Wickes.

CORVALLIS, Oregon—Bill Wickes vividly remembers his first Hewlett-Packard calculator: the HP 45.

“It was 1973 and I was a new physics instructor at Princeton University,” Bill says. “The calculator cost \$400, and those were the days when \$400 was a lot of money. My wife was utterly mystified why I would spend so much.

“A couple of days later she spent about the same amount on a set of crystal and china. Neither of us understood why the other person wanted those things. Today she’s quick to point out that she still has the crystal and china, but I’ve long since traded the HP 45 for another calculator.”

In retrospect, the calculator was a fantastic deal for Bill—and HP.

If Bill Wickes isn’t the father of HP’s current crop of best-selling scientific calculators, at the very least the R&D project manager at the Corvallis (Oregon) Division is the favorite son.

Says one Corvallis colleague, “R&D is a collaborative effort, but I’d say that Bill’s contribution to the current line of our technical products is 80 to 90 percent of what’s there. He’s an amazing guy.”

What makes Bill so remarkable? Take your pick: He’s a nationally known crusader for calculators in the classroom; a Ph.D. physicist from Princeton; “world-class” Trivial Pursuit player, according to local sources; and a brilliant software designer.

The story really begins in 1981 when Bill was a physics professor at the University of Maryland. He bought an HP 41C advanced programmable calculator capable of running more than 2,500



Inspiration comes from a variety of environments, including a stroll around the site lake. Bill Wickes’ team includes Charlie Patton, Max Jones, Gabe Eisenstein and Diana Byrne.

programs. It was the most advanced handheld calculator of its era. To Bill, the HP 41C was more than a complex tool; it was a challenge.

“It was like a puzzle,” Bill says. “I wanted to dissect the program code, figure out how it works and then make it do things it wasn’t supposed to be able to do.”

Within a few months of trial-and-error experimentation, he developed “synthetic programming” for the calculator—new instructions which directed the HP 41C to “store data in places that weren’t supposed to exist, print characters the printer didn’t know and greatly shorten ways of doing things that were meant to be done the long way,” according to one publication.

For example, a cartoon-symbol “goose” normally moves from left to right across the calculator’s display screen to let users know that the machine is working. In a humorous vein,

Bill even perfected the backward-facing goose. Before he was finished, the goose could fly backwards, flap its wings, fly in flocks and collide with self-respecting, right-facing geese.

“In a sense,” Bill says, “I was an outlaw.”

Three months later, Bill published his findings in a book and sold 20,000 copies of the English version, 8,000 in German and a few thousand French-language copies. A decade later, he still gets orders for the book.

Corvallis management did the only logical thing: they hired Bill to develop the HP 41C’s descendants.

Bill became a project manager six months into his HP career and his software-design team set out to develop an entirely new operating system for handheld calculators.

In 1985 the team virtually locked itself

## It adds up

into Bill's home recreation room for three days of pizza and brainstorming. If you could develop the perfect scientific calculator, the team theorized, how would it look, feel and operate?

The result was the HP 28C, the first handheld calculator capable of symbolic, as well as numeric, calculations. The HP 28C—and a later version, the HP 28S—quickly became the preferred calculators of U.S. college students studying engineering and mathematics. In fact, the HP 28S is a requirement for all cadets at the U.S. Military Academy.

"Calculus instruction hadn't changed much since Sir Isaac Newton invented it 300 years ago," says Clain Anderson, Corvallis Division education program manager, "and Bill and his team changed everything in a matter of months."

Not content with merely revolutionizing the handheld scientific-calculator market, the Corvallis designers developed several more products with advanced features during the next five years.

In 1990, the division introduced the HP 48SX scientific expandable calculator. It combines the calculation and

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graphics capabilities of the HP 28S—a later version of the HP 28C—with the flexibility and expandability of the HP 41. For instance, students can enter equations into the calculator just as they are written in a textbook.

"The HP 28S was our most successful product to date and the HP 48SX surpassed that," Clain Anderson adds. "Bill's leadership helped us develop a



**Bill Wickes used to teach physics and research astronomy. Today his backyard astronomy is a hobby he shares with his children, Lara and Kenneth.**

range of calculators that is the best set of computation products available anywhere."

"Bill and all of the people at HP are good listeners," says John Kenelly, alumni professor in Clemson's engineering and mathematics department. "Some of us in the department suggested several improvements to the HP 28C and many of them are included in the HP 48SX. That's the calculator we recommend to all students in engineering and mathematics."

John, a national leader in calculus reform, firmly believes that calculators have an important role in the classroom. While some academicians maintain that students can't learn mathematics properly with calculators, John argues that the products enable students to concentrate on math *concepts* rather than *mechanics*. He credits Bill, a former university instructor, with aiding his campaign.

"Bill has been a constant source of help and inspiration to us," John says. "He fundamentally *knows* the educa-

tional process and what it takes to develop good scientists and engineers. He's one hell of a smart guy."

Says Dennis York, a Corvallis R&D colleague, "There's a term in our business called 'polymath,' and it's defined as encyclopedic learning, especially in mathematics. That definition fits our products—and Bill—well."

An ability to translate complex mathematics principles into bite-sized, easy-to-understand language is a gift Bill has, co-workers say. Bill, who once taught a nontechnical university course called Physics for Poets, says that it's a natural ability.

"To some people, learning physics is like taking a drink of water out of a fire hose," Bill says. "But I've always approached it as a fun puzzle to solve."

"It's just like trying to figure out how to make the 'goose' fly backwards. You have to have a certain kind of warped mind like mine to appreciate it." ■