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Striking A Chord

New chordic keypads for portable computers give users a free hand

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Fishermen love to tell stories about the one that got away. Inventors talk about the ones that almost did.

Their great catches are ideas — revolutionary, world-beating discoveries ignored for years until someone finally realized their true potential. Penicillin, for instance, which languished in laboratories for more than a decade before an Australian pathologist demonstrated its power to treat infection. Or the fax machine, invented in 1902 but not refined for general use until the 1980s.

Now, some gadgeteers are pushing the computer industry to take a fresh look at another venerable idea whose time may finally have come — chordic keypads.

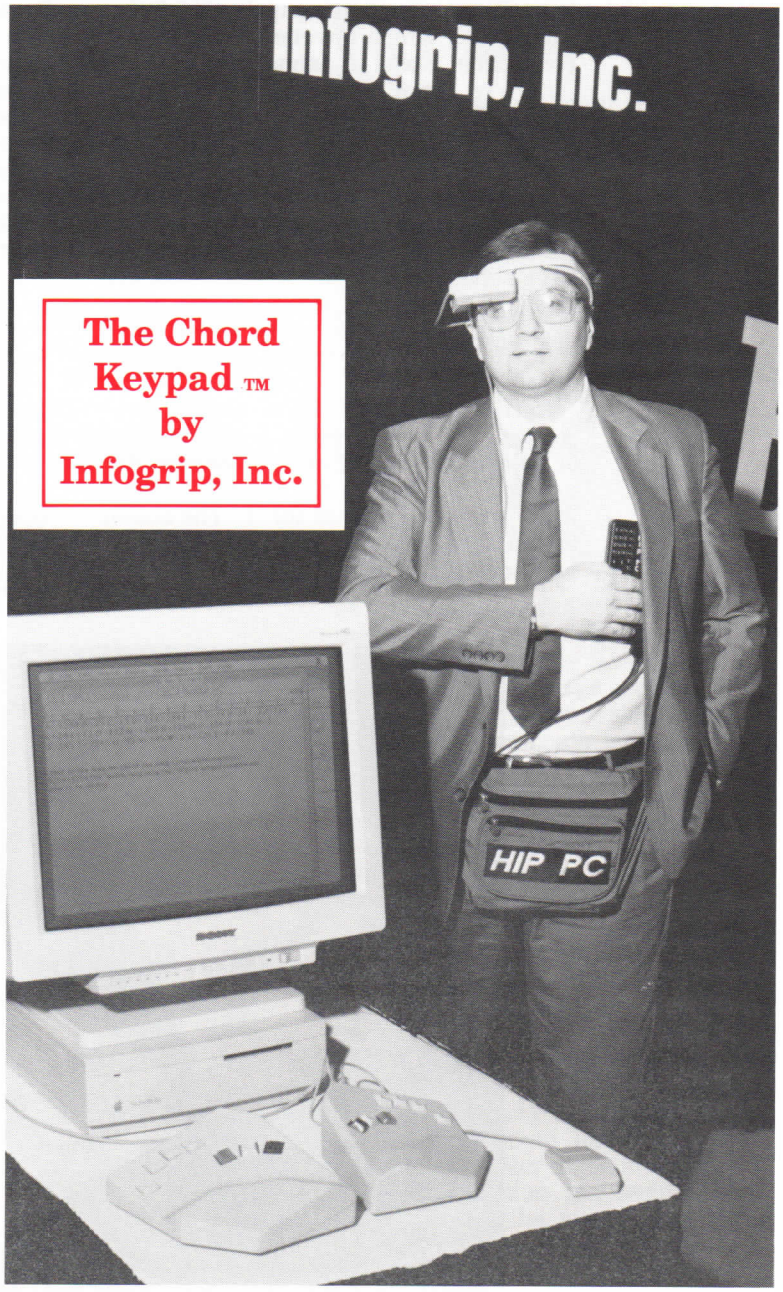
Intended as an alternative to standard computer keyboards, the device uses multiple key combinations to enter data and text in much the same way as a court stenographer's machine. And while the invention itself is not new, proponents say it is the ideal input system for ever-smaller, more portable computers.

"I can teach little kids how to do it in three or four hours"

Doug Engelbart, SRI International

"A chord keyboard allows you to do things you couldn't do any other way," says Doug Platt, president of Select Tech in Jenkintown, Pa., who has been working on a portable system. "You're really going to see them take off."

The earliest chordic keypads were developed for Morse Code operators in the late



Infogrip Inc.'s Chord Keypads and Hip PC.

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David Nagel, Senior Vice President for advanced technology/ Apple Computer Inc.

19th century as an alternative to the telegraph key. Their first application to computers came in 1968, when Doug Engelbart of SRI International built a five-finger keyset to use with another of his inventions — the computer mouse.

Since then, chordic keypads of one sort or another have sprung up in isolated electronics labs all over the world, often created by independent tinkerers unaware of the others' work. But so far only two companies are manufacturing a chordic keyset: Microwriter Systems of Great Britain and Infogrip Inc. of Baton Rouge, La., which unveiled a Macintosh-compatible model in January.

"We're from Louisiana, so I guess we're not smart enough to know it couldn't be done," says Infogrip President C. Ward Bond. "We just did it."

There is ample reason for doubt. While chordic keypads are designed to replace standard computer keyboards, the two have almost nothing in common. Most are designed to be used with a single hand. Infogrip's model has only seven keys compared with the usual 101-key keyboard.

Rather than typing in single keystrokes, the user presses a combination of unlabeled keys for each character. For example, the thumb for 'a,' little finger for 'e' and both at once for 'f.' The action is similar to playing a piano, although the hand never changes position.

The five character keys and two shift keys can be combined to duplicate all the features of a standard keyboard, including functions like delete and copy. And while the chord system may look difficult to a novice, aficionados say it is actually quite easy to learn. "I can teach little kids how to do it in three or four hours," says Engelbart.

Those who examine the devices often walk away impressed but skeptical. "As a technologist I think it's a great idea," says David Nagel, Apple Computer Inc.'s senior vice president for advanced technology. "From a business perspective, I'm not sure."

Proponents say chordic key entry has several advantages over conventional keyboards. Because the fingers never change position, looking at the keys doesn't help, so users need never take their eyes off the screen. And using only one hand to enter data or text leaves the other free to perform other tasks, such as manipulating a mouse or paging through a book. Or even driving a car.

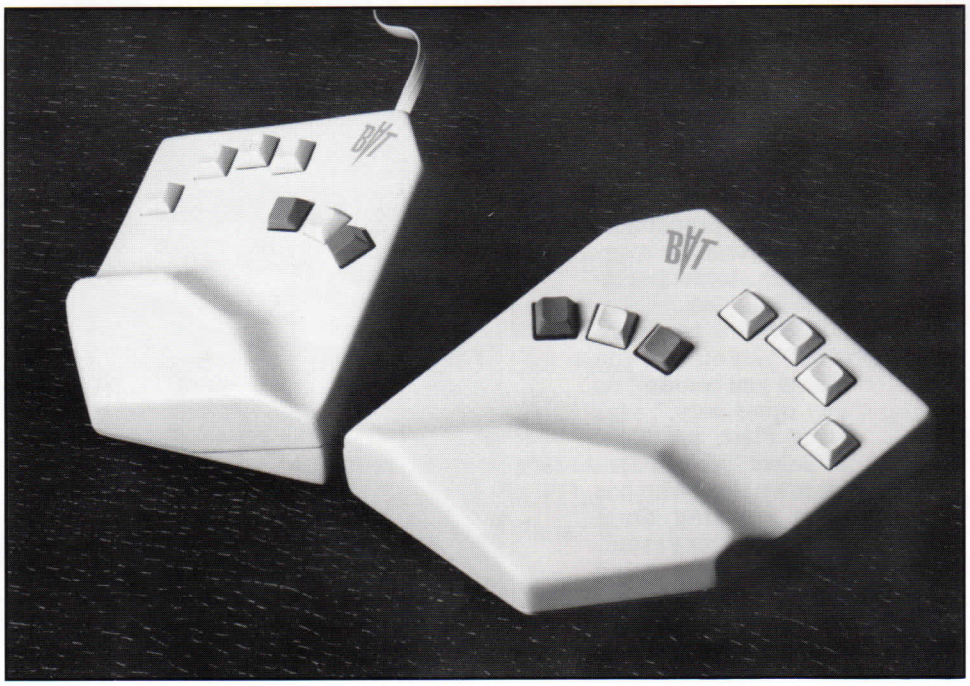
"I wrote a short story while driving. It's not hard to do at all."

Terry Kepner, editor of Portable 100 magazine

Terry Kepner, editor of the computer magazine Portable 100, has used the chordic keys on his handheld computer to compose fiction on the open road. "I wrote a short story while driving," he says. "It's not hard to do at all."

Indeed, it is the advent of portable computers that may finally bring "chording" out of the laboratory closet. While it is possible to miniaturize nearly all the components of a desk-top machine, conventional keyboards can shrink only so far before they become unusable.

According to Infogrip's Bond, the prob-



Cover Story

New keypads strike a chord with some users

■ CHORD

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lem is already apparent in the many notebook computers that have cropped up in recent years. Despite the notebook designation, "I have never seen anyone using their computer to walk around and take notes." Sitting down with a lap-top is too clumsy, while pushing the tiny buttons of a palm-top is too slow and difficult. But with a one-handed keyset, computing on the go can become almost second nature.

That's just what Gary Friedman was looking for when he devised the Data Egg. "My problem is, I've got a brain that insists on coming up with its best ideas at the worst possible time," he says.

Plastic Easter egg

So Friedman, an engineer at NASA's Jet Propulsion Laboratory in Pasadena, built a chordic keyset for his palm-top by attaching buttons to a plastic Easter egg. He has since come up with several other palm-sized models, including one built into a Motorola beeper. "If you have an idea, you can pull it off your belt, type what you want and not draw attention to yourself."

Backers say the speed and privacy of chordic keypads make them far more practical than the other commonly cited interface alternatives for portables, electronic pens and voice recognition.

Pen tablets require two hands to operate and demand visual attention. And when it comes right down to it, "pens are slow," says Platt. "That's why we invented the typewriter." And even fully perfected voice systems will be impractical in many situations. "If you're in a meeting or taking notes on a phone call, voice doesn't make sense. A chord keyboard is silent and private."

Infogrip already markets Microwriter's British palm-top in the U.S. as the Mini-BAT. The company has combined the device with a belt-mounted 286 processor, disk drive and headset display to create the Hip PC, which it bills as the world's first truly wearable computer. The keyset is attached to the shirt with a Velcro strip.

The Napoleon pose

"I'm in a kind of Napoleon pose when I use it, but it's quite comfortable," says developer Doug Platt. " I've been using this thing full time since September, and it feels like an extra brain. I miss it when it's not on."

All of which raises the question: If chordic keysets are such a great idea, why haven't they caught on before?

The biggest reason, chording enthusiasts say, is fear.

"People are scared of it," Kepner says. "Most people look at a computer as an electric typewriter. They say, 'Where are the letters? Where are the numbers? I can't do this!' Those aren't accurate reactions, but they are the one's people have. Once you show them how it works, they say, 'My God! How easy!' But you have to overcome that obstacle."

Even computer designers and developers can be put off. "Scientists and engineers like to work on sexy, glamorous problems," says Platt. "Five buttons is not sexy or glamorous. You can't show off your amazing brainpower by working on a chord keyboard."

What's more, "engineers are afraid to look stupid. So you find a (hesitancy) to learn the system."

20 hours training

In fact, chording proponents say the system is so simple that a novice can enter text at a rate of 30 to 35 words per minute with 20 hours training. And they argue that transmitting thoughts with combinations of fingers rather than single keystrokes is a far more natural way to communicate with a computer.

Like human sign language, "chording is a gesture," says Infogrip's Bond. "It is the creation of a physical symbol." Unlike the mechanical act of typing, chord sequences eventually become embedded in the language centers of the brain. And as a physical skill, chording tends to have more staying power.

To encourage people to experiment with chord entry, Infogrip is developing software that will allow users to try the system on a standard keyboard first.

But despite all the advantages they claim for chord devices, even some of the faithful concede the technology may just end up back on the shelf.

"I'm still not sure people are going to accept it," says Kepner. "There are plenty of examples of things that should have been a success and never made it off the ground floor. You can build the best thing in the world, and if people don't like it, they won't buy it — no matter how efficient it is."

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The Chord Keypad™ was previously marketed as The Bat.

The layout of keys on today's keyboards was originally designed to minimize jamming of the mechanical parts of early typewriters.
This basic format has remained unchanged since the 19th century.
The Chord Keypad now brings keyboard technology out of the dark and into the 20th century. Its sensitivity to human thought/response patterns and body mechanics allows users to work more efficiently and comfortably.

THE CHORD KEYPAD™

for fast, accurate data entry.

The Chord Keypad is available for Macintosh, IBM PCs, Compatibles, and other platforms, including UNIX.

What is the Chord Keypad?

The Chord Keypad is a revolutionary man-computer interface. It comprises two identical keyboards, one for the left hand and the other for the right hand.

The Chord Keypads are separate and independent from each other, i.e., you can enter all the characters and commands on the standard computer keyboard through either hand. To increase efficiency, you can enter data using both hands.

How does the Chord Keypad work?

Each Chord Keypad has seven keys, five of which are positioned directly under your fingers and thumb. The remaining two "shift" keys are positioned so that your thumb can easily reach them by moving a little to the left or right. Data is entered by pressing combinations of keys, much like the manner chords are played on a piano.

Is the Chord Keypad easy to learn?

You can learn the basic chords for the alphabet and numerals in less than an hour. Most other characters and commands use simple mnemonics that are based upon your knowledge of these basic chords. A computerized tutorial and quick reference guide are also provided.

Why should I use the Chord Keypad?

The Chord Keypad has several features and advantages that will increase your productivity:

- You do not have to look down at the keyboard (no more "hunt and peck").
- You need only use one hand (left or right). The other hand can be dedicated to other useful activities, like using a mouse or flipping documents.
- The Chord Keypad eliminates the need to learn standard touch-typing skills. (The Chord Keypad is easier to learn.)
- You can enter numbers at high speed.
- You can enter a word or phrase with a single chord using simple macros.

Some other important features:

- The Chord Keypad is user programmable. You can add additional chords to suit your special needs.
- The Chord Keypad is ergonomically designed to minimize strain, fatigue and disorders commonly associated with prolonged use of the standard computer keyboard.
- Braille programs (one hand or two hand(are available.

The bottom line.

The Chord Keypad allows all computer users, including novices, to become highly efficient and productive.

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