

The New York Times

June 30, 1991

The Executive Computer; What a More Powerful Pen-Based Computer Can Do

By **PETER H. LEWIS**

The NCR Corporation has introduced an intriguing pen-based "notepad" computer that is truly ahead of its time. The notebook-size NCR System 3125, operated by an electronic stylus rather than a keyboard, does not yet have any software, and it has not yet received approval from the Government agency that approves electronic devices. While NCR says the System 3125 will be ready in August, it may be many months before there are software applications to take advantage of the machine.

Even so, people who saw the prototype computer at the annual PC Expo trade show in New York City last week said it represents the beginning of a class of computers that are likely to be widely used by businesses in years ahead. Millions of people, from blue-collar workers to doctors, cannot use conventional portable computers because the keyboard is inconvenient when they are walking around on the job.

As a result, these workers often record information using a clipboard and a pencil, then re-enter the information into a computer later on. A store clerk takes inventory, an architect sketches a room, a police officer fills out an accident form, an insurance agent fills out an application, and so on. Clearly, these workers could benefit from the computer's power to store and retrieve information. As a result, NCR and dozens of other computer hardware and software companies are racing to develop computer systems that can read handwritten characters and link electronic forms to business data bases.

"The NCR 3125 is the thunder before the storm," said William Bluestein, who tracks the nascent pen-based computer market for Forrester Research Inc. of Cambridge, Mass. "This whole class of computers won't take hold until I.B.M. enters the market -- I.B.M. has spent a ton of money developing its own pen-based machine -- but still, NCR now has about a six-month head start." Although the decline in its market share has been widely noted, I.B.M. is still the dominant computer maker, and many people believe its participation is needed to legitimize the pen-based market. Big Blue says it plans to introduce its pen-based computer by the end of the year.

The only working pen-based notepad computer today is the Grid Systems Corporation's Gridpad. Grid officials said 10,000 Gridpads were sold last year and that the pace this year was "double that." Grid, a division of the Tandy Corporation based in Fremont, Calif., last week showed off its new version of the Gridpad, which differs from the original mainly in its use of an illuminated writing surface.

From a technical standpoint, the NCR machine is significantly more powerful than the Gridpad. The NCR 3125, which weighs slightly less than four pounds, is built around the Intel Corporation's i386 SL microprocessor, which is several generations ahead of the Gridpad's simple 8086 chip. While the Gridpad can "read" only upper-case, block-

printed letters, the new NCR machine is apparently able to decipher upper- and lower-case letters with a high degree of accuracy. It cannot, however, recognize cursive writing -- let alone a doctor's handwriting. (The NCR machine uses a cordless stylus, unlike the tethered one used by Grid. At the rate that ink pens are lost, this could turn out to be an expensive liability.)

NCR's machine is also significantly more expensive than the Gridpad. A basic Gridpad costs about \$2,500, and the basic NCR 3125 will cost around \$4,700, company officials said. The price, NCR officials said, includes the buyer's choice of either the Penpoint operating system being developed by the Go Corporation of Foster City, Calif., or the Windows for Pen Computing operating system being developed by the Microsoft Corporation of Redmond, Wash.

Equipped with enhancements, like a modem, hard drive and software, the machine could cost as much as \$6,000. "Six grand is a lot to spend to outfit a field technician," said Mr. Bluestein of Forrester Research.

Alan Lefkof, Grid's president, said the Gridpad is an "electronic clipboard," while the new NCR machine is of an emerging breed he called a "personal productivity tablet." He said Grid planned to introduce its own personal productivity tablet sometime next year, "probably in the same price range as NCR's."

The difference between the two types of pen-based machines, he said, is that electronic clipboards are designed for a blue-collar work force that deals primarily with forms. Such workers typically have no need to run a spreadsheet, for example. The personal productivity tablets, Mr. Lefkof said, are designed for white-collar executives who need the power of a PC to manipulate data in more sophisticated ways.

The true power of these executive notepad systems will become apparent in a year or two when new types of applications, designed specifically for pen-based computers, emerge. "Some day an architect will plug an infrared measuring scanner into the computer, stand at one wall, and the exact room measurements will be captured and converted into a room diagram that can be saved as a standard CAD file," said Ralph A. Phraner, chief executive of the Stylos Development Corporation, citing one example of how pen-based computers might be useful in computer-aided design. "It significantly cuts down on labor, and reduces three site visits to one."

Other likely uses will be the ability to respond to electronic mail with handwritten notes; the ability to send and receive facsimile documents with signatures, sketches and diagrams; calendar and scheduling software, and many features for traveling sales representatives.

Such interesting applications will come about only after some very hard work by software developers in the months and years ahead, of course. And the biggest issue for these software developers is which operating system software to embrace.

Go, a private company, is believed to be the front-runner with its Penpoint software, scheduled for delivery later this year and already endorsed by I.B.M. Penpoint is a completely new operating system designed for pen computers.

Go's chief rival (seemingly everybody's chief rival these days) is Microsoft, the software giant. Microsoft has vowed to release Windows for Pen Computers before the end of the year, and it has been waging an aggressive campaign to woo software developers. Windows for Pen Computers is an added layer of operating system atop Windows and DOS. Its advantage is that it will work with existing Windows programs as well as any new ones written specifically for pen computers.

Hardware vendors are being circumspect. NCR officials said they would offer both systems and let the customers decide. "The level of diplomacy would make the United Nations proud," Mr. Bluestein said.