developed for their one- to four-line LCD screens, they will pose a considerable threat to the luggable market.

In midsummer, Texas Instruments plans to release spreadsheet and word-processing software for its Compact Computer 40 (CC-40). The new software will expand the CC-40's primarily scientific and engineering markets to include business and sales executives, according to a TI spokesman. Hewlett-Packard Co. plans the same type of additional software for its HP-75C. Kirk Newburgh, product-marketing manager for the handheld-computer section of HP's portable-computing division, claims the company's new spreadsheet software is "the world's most advanced" and that it was "developed to truly work on a one-line display."

Blawie questions whether there actually is a business-executive market for these portables. "Executives don't want to type," he says, as they are more used to dictating travel memos and expenses for a secretary to type. And one industry expert notes that Sony's Typecorder really has not caught fire with business executives, its targeted market.

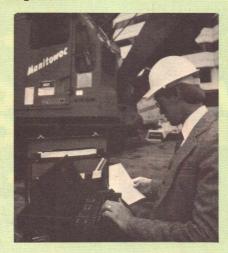"These [notebook-size] computers

Grid using Compass to find business

Portable personal computers may not seem like military equipment. But Grid Systems Corp. reports keen interest in its portable PC on the part of the United States government, particularly the Department of Defense.

Grid's Compass PC, which at its introduction in 1981 was praised for its elegant design but criticized for its high $8,150 price, is small, light and ruggedized, explains John Ellenby, chairman of the three-year-old startup. The compact, nine-and-a-quarter-pound unit is designed to operate in ambient temperatures from 40 to 105 degrees Farenheit and has withstood shocks of up to 135 times the force of gravity, he says. Other military pluses are a small, bit-mapped, amber-colored flat panel display and a nonvolatile magnetic bubble memory for storage of the unit's brace of Intel Corp. 8086 general-purpose and 8087 match-processor 16-bit microprocessors.

Ellenby and new president David W. Hanna say in addition to DoD, the Department of Transportation and several "confidential agencies" have expressed interest. Defense contractors already have discussed acting as original-equipment manufacturers for a mil-spec version of the Compass. One contemplated change for military use is replacing the present keyboard with a touch-sensitive membrane type for greater reliability. If Grid makes a government model (the decision to do so has not yet been made), it would set up a separate division to manufacture it. And to reduce heat and parts count in the crammed unit, Grid would incorporate some 19 "glue" logic chips into one 3200-gate, low-power complementary-MOS logic array from LSI Logic Corp.

Military interest is sparked by the Compass's price, which seems expensive to civilians but is cheap by DoD standards, Ellenby says. The company set a high price to discourage individual orders, as its real goal is volume sales to the 1,000 largest corporations, he continues. If those companies place incremental orders so that Grid can rationalize production, the company will pass the savings on to customers, meaning discounts as high as 25%, according to Ellenby.

Government business would be a nice boost for Grid, which has attracted a lot of publicity and venture-capital funding ($20 million in three rounds) but few orders so far. Ellenby says that the company has had 60 units at Beta sites and has built 300 systems. This calendar year's plans are for between 8,000 and 12,000 units, but Ellenby admits that Grid probably will ship fewer than that. To prepare for growth, the company leased three 42,000-square-foot buildings in a new Mountain View, Calif., industrial park. It occupies one and will expand manufacturing into another this year.

However, management has taken steps to get things moving. Promoting Hanna, formerly with International Business Machines Corp., to run day-to-day operations freed Ellenby to concentrate on development. Grid also has made some product enhancements including porting the MS-DOS operating system to open up more available applications software; adding disk drives for more mass storage; introducing GridReformat to automatically convert data from other computers into a format suitable for the Compass; and adding emulation capabilities with IBM 3101 and Digital Equipment Corp. VT 100 terminals.

But even with the terminal-emulation capability "it's still Grid and not IBM or DEC," observes Timothy J. Berry, vice president of the computer software group at Creative Strategies International, a San Jose, Calif., market-research firm. In corporate politics, a manager takes more risk with his boss if he buys Grid and it doesn't work out than if he buys IBM and it doesn't work well, Berry notes.

Moreover, Grid has positioned the Compass somewhere between a workstation and a portable terminal. Such a position is confusing because the Compass is a terminal, Berry says. And it's an expensive terminal at that, he adds.

Even so, "this market is growing so fast that new entrants that define where they're going and match their strategy to the market will do well. And Grid is doing just that," Berry continues. If a company maintains a narrow focus, it can do well and "Grid has done that with Compass," he says. What's Berry's bottom line on Compass? "I want one," he concludes.

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