for a VGA monitor. An external floppy disk and keyboard are options. It lacks a docking station and high-speed networking port, although an optional PCMCIA Ethernet card may be added. This card makes the 325Point a reasonable choice to live on a NetWare network. No Token-Ring card is available.

Fujitsu claims that its power-saving circuitry can get as much as 7.6 hours from a single charge. The unit is likely, however, to run out of power after roughly 3 hours—the lower end of the range Fujitsu claims. Battery recharging took 4 hours with the unit on and 1.5 hours with it off. The 325Point uses a passive Wacom pen stylus that doesn't use batteries, an advantage over the Dynapad, which uses an active CalComp digitizer.

We had difficulty performing basic file-management, software-loading, and file-import functions using the PenPoint operating system. We tested a beta unit, however, and Fujitsu is working to iron out the wrinkles.
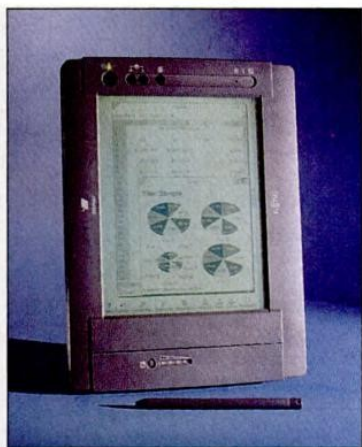
During Suitability to Task analysis, we found screen images barely visible under harsh overhead lights and not at all visible in bright sunlight, regardless of the backlight adjustment. A little angling was required to attain adequate visibility so that we could perform the tests. Notetaking, however, was a breeze. The electronic ink flowed smoothly (much better than the Dynapad's), and the screen display was very solid while being written on.

The 325Point's handwriting recognition capabilities were only fair. The machine handles uppercase and lowercase block letters as long as they are written within screen-defined handwriting areas.

The 325Point can recognize predefined and user-defined gestures, which are helpful when writing and editing. You can also turn off handwriting recognition until you have written a page or filled out a field to help speed the process along. Overall, we found the 325Point's handwriting recognition and pen proficiency to be better than the Dynapad's and more like the Apple Newton's.

As a mobile computer, the 325Point was above average, thanks to its good battery life and PCMCIA modem options. Because you can add a keyboard, an external VGA monitor, an external floppy drive, and a LapLink or other desktop-PC serial connection, the 325Point can serve as an everyday machine. Its small 42MB hard disk, however, might be a problem. With the judicious use of JEIDA and PCMCIA memory cards, its storage capacity could be extended. These cards are expensive, however.

The 325Point is a flexible pentop computer that could be used for a number of vertical applications, but because of its size, weight, lack of wireless communications options, and lack of a suite of built-in personal organizer tools, we would not recommend it as a suitable PDA replacement.


The 325Point is a customizable pen tablet for vertical applications.

AST Research Inc.

GRiD PalmPAD

BY DON CRABB

The GRiD PalmPAD is a small pen-based computer designed for rough use and aimed primarily at field users who abuse machines or who work in harsh environments. It's appropriate in these situations despite its painful PenRight! interface and slow 9.5-MHz NEC V20 CPU.

It is this CPU that is the PalmPAD's most prominent drawback. It encumbers
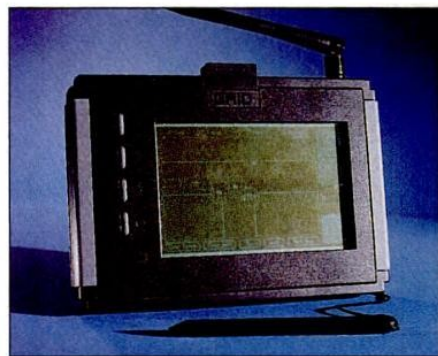
The PalmPAD is a ruggedized 2.9-pound pen computer with a built-in radio modem.

its host in the same way it hampers the older PoqetPad. Unless you are running simple form-based programs, you probably won't be happy with the computing speed or prowess of the PalmPAD.

The PalmPAD is ruggedly built and has an exterior that is molded almost entirely out of a single piece of plastic, with rubber seals around the screen and control buttons that effectively protect the unit from drops and spills. Also ruggedized are a built-in radio and a number of modem options.

The PalmPAD weighs 2.9 pounds and measures 9 by 6.25 by 1.9 inches. It is small enough to attach to your wrist or belt and will run all day on a single set of batteries.

The PalmPAD doesn't support GO Corp.'s PenPoint or Microsoft Windows for Pen Computing. It runs a proprietary operating system, PenRight!, that lacks handwriting recognition and is essentially DOS with a stylus-based, keyboard touch-screen interface. The PenRight! interface lets you point at icons on-screen to control and run applications.

During testing, we found that the applications we were able to load were both slow to launch and slow to respond. When you combine this decidedly sluggish performance with a poor display—the PalmPAD's 6.5-inch (diagonal) 640-by-400 backlit transreflective LCD screen has only two shades of gray and no true black—you end up with a pen computer that is more of a curiosity than a useful tool for handling daily computing needs.

The PalmPAD comes with a scanty 2MB of RAM, which cannot be upgraded. It also has no internal hard disk. It does, however, have a PCMCIA

SUITABILITY TO TASK

Fujitsu 325Point

	POOR	FAIR	GOOD	EXCELLENT
Daytimer	●	●	○	○
Communications	●	●	●	○
Custom applications	●	●	●	○
Handwriting recognition	●	●	○	○
Mobility	●	●	●	○

Type I slot (with a built-in IDE controller) that can hold SunDisk flash-memory cards of up to 30MB in size. Unfortunately, though, the PCMCIA slot lacks an eject mechanism. If the PCMCIA card you plug in doesn't have a pull tab, you must resort to a pair of needle-nose pliers to pull the card out.

Because of its processor, the PalmPAD is too slow to be used as an everyday notebook computer. It also can't be considered a PDA because it is too big, too heavy, and lacks integrated personal organizer tools and handwriting recognition. With, however, its high-speed modem options and cellular radio, the PalmPAD has PDA-like communications capabilities.

The PalmPAD is best used as a device for remote data-collection tasks (such as taking warehouse inventory), when using a keyboard can be cumbersome and time consuming. Its slow processing speed and lack of a built-in hard disk (hard cards notwithstanding) limit its appeal and usability. Add to that the frustration of using PenRight! and you've got a machine that's definitely suited only for specialized uses that demand ultrarugged pen-based computers.

Tandy Corp.
Tandy Z-PDA

Casio Inc.
Casio Z-7000
Personal Digital Assistant

BY CHRISTOPHER BARR

This PDA (formerly called Zoomer) is the sporty progeny of two consumer electronic giants, Tandy and Casio. Casio has longtime experience making its B.O.S.S.

personal organizers, and Tandy has spawned thousands of retail outlets stocked with electronic gadgets.

The Tandy/Casio has been granted the best of both worlds. Shoehorned into 4MB of system ROM are more applications than can be described in one breath. The Tandy/Casio is a personal organizer, notetaker, and sketch pad, and it comes with Pocket Quicken (a subset of Intuit's Quicken desktop personal finance software) to track your spending. It also has a front end to America Online that can be used for sending faxes and e-mail and for reading stock quotes, news, and weather reports.

Solitaire and two other games are installed, as is a dictionary, a translator for 26 languages, and a calculator. It comes with a conversion calculator with predefined fields to determine currency exchange values and loan amounts, and it performs other simple financial figuring. The conversion calculator can also tell you how many acres are in a square mile and how many cups it takes to make an imperial gallon. Other categories include length, mass, temperature, time, and velocity. Most of the applications are accessed by pressing one of the preprogrammed icons at the bottom of the Tandy/Casio's display.

All this fits in the palm of your hand for a street price of around $700. The Tandy/Casio measures 4.2 by 6.8 by 1 inch, comes with 1MB of RAM, and weighs an even 1 pound. The 4.75-inch (diagonal) reflective monochrome LCD panel, which you write on with a miniature pen that telescopes from 2.75 to 4 inches, has a resolution of 320 by 256 pixels. The pen, which is passive (meaning you can use your finger or other instrument), is stored in a silo.

The Tandy/Casio comes with an external power hookup, contrast and volume controls, a headphone jack, a proprietary serial port, a single PCMCIA Type II socket, and an infrared trans-

With America Online and game buttons, the Tandy/Casio mixes business and pleasure.

ceiver. A single-button cursor control and two Nintendo-like "fire" buttons will be available for future software releases. Accessories such as a printer cable, an AC adapter, extra pens, and software to link to a PC should be available soon.
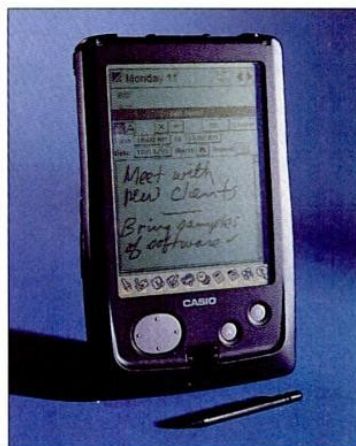
The Tandy/Casio's multitasking operating system from GeoWorks, called GEOS, has a graphical user interface and provides users with the file manager, various printer and communications drivers, and a pop-up keyboard that can be used instead of the pen. The PCMCIA socket can be used for a modem, adding applications, or providing additional storage. When you add applications on a PCMCIA card, the new programs appear as menu choices on the launcher icon.

The Tandy/Casio runs on three AA batteries and comes with two lithium backup batteries that will keep your applications in memory during a battery change. Since we tested a preproduction model, the results of our battery rundown tests cannot be considered accurate, but Tandy and Casio estimate the Tandy/Casio's battery life at about 100 hours.

The outstanding battery life comes at the price of performance. While the Apple Newton MessagePad and the AT&T EO 440 Personal Communicator use new 32-bit processors, the Tandy/Casio uses a proprietary processor developed by Casio that is the