The Pilot™ Connected Organizer

Extending Desktop Applications to the Users' Pockets

U.S.Robotics®

Executive Brief: The Pilot Advantage

Pilot™ from U.S. Robotics is the first truly pocket-size personal organizer designed specifically to extend and enhance the capabilities of your desktop computer.

Running a highly efficient operating system optimized for handheld devices, Pilot gives you instant one-button access to powerful productivity applications — no need to wait for the system to boot or for an application to load into memory.

And with Pilot, your organizer and your personal computer are always in sync with each other. The Pilot's HotSync™ technology automatically synchronizes information with a Windows® or Macintosh® PC at the touch of a button.

This close coupling of handheld organizer and desktop PC allows the two devices to work in tandem, with the PC taking on the heavy processing and storage chores while the Pilot does the light and quick tasks. As a result, no other organizer on the market provides so much functionality in such a compact, low-cost, easy-to-use package.

Pilot features an intuitive graphical interface and a highly accurate hand-writing recognition system called Graffiti®. Using the Pilot's stylus and a special writing area on the display screen, you can enter alphanumeric information and take notes at a 30-words-per-minute clip. Or you can use Pilot's on-screen keyboard or the keyboard on your PC to enter data.

From the IS manager's point of view, Pilot is a non-intrusive standards-based device that's powerful and flexible, yet requires minimal support. Optional "conduit" software allows Pilot to exchange information seamlessly with popular personal information management (PIM) applications, including Microsoft's Schedule+™, Lotus' Organizer™, and Starfish Software's Sidekick®.

In addition, Pilot supports standard development tools that make it easy to add custom applications to suit your organization's information infrastructure and unique work environment. With the device's flexible design, you can expand memory and upgrade functionality easily.

Pilot is the pocket-size organizer that's always in sync with your business.

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Designed To Leverage the Power of Your PC

A handheld organizer is ideal for looking up information and gathering a limited amount of data in a mobile environment. A desktop personal computer is well suited for entering large blocks of data, running graphical and memory-intensive applications, printing documents, storing and backing up files, and communicating via wide area and local area networks.

By combining the two, you get the best of both computing worlds.

The Pilot connected organizer is a handheld extension of your PC, rather than a miniaturized PC running a stripped-down version of a PC-style operating system. U.S. Robotics' Palm Computing subsidiary engineered Pilot to leverage the capabilities already on your desktop, without forcing you to split information between a handheld and a full-size device.

Pilot was designed from the ground up to meet these compelling user needs:

- Focused personal information software that complements standard business applications
- Seamless synchronization with industry-standard desktop environments
- A true pocket-size form factor for take-along convenience
- Fast, streamlined access to applications and data
- An intuitive interface and accurate input system
- Long battery life using standard alkaline batteries
- Low cost

Pilot At a Glance

Figure 1. The Pilot Connected Organizer

Most subnotebook computers and personal digital assistants are too bulky to carry around easily. But Pilot is a true *pocket-size device.* Measuring just 4.6 by 3.1 by 0.6 inches and weighing only 5.7 ounces with batteries, Pilot goes wherever you go — comfortably. It fits as easily into a shirt pocket or small purse as it does into the palm of your hand.

At the heart of Pilot is the *Palm Operating System (Palm OS)*, a 32-bit software architecture optimized for handheld computing that runs on a Motorola 68328 processor. Palm OS requires only 32K of system memory, leaving plenty of space for applications while helping to keep the size and cost of the device to a minimum.

Pilot At a Glance (continued)

Because of its *flexible architecture*, upgrading the Pilot's memory and software couldn't be simpler. Users can do it themselves by inserting a new circuit card in the back of the device.

Control buttons for powering on, scrolling, and invoking personal productivity applications are within easy reach on the front of the Pilot. Most data can be accessed and viewed by means of these buttons.

Pilot offers you three different ways to enter data. While at your desk, you can type the information into your PC and then transfer it to Pilot during synchronization. Away from your desk, you can use Pilot's pop-out *stylus* to operate an *on-screen keyboard*, or you can write information directly on the screen using the stylus and U.S. Robotics' highly accurate *Graffiti* power writing system.

The Pilot's *easy-to-read screen* features a display area and a writing area for alphanumeric input, with separate sectors for entering letters and numbers with the stylus.

Pilot comes with a *docking cradle* that attaches via cable to one of your PC's serial ports. The *HotSync™ button* on the cradle transfers data between Pilot and PC in just a few seconds with a single touch. You can also use a modem to synchronize the two devices from a remote location.

The Pilot's *Personal Information Manager* (PIM) software includes five focused applications: Address Book, Date Book, To Do List, Memo Pad, and Calculator. Companion versions run on Windows or Macintosh computers for easy data entry and viewing at your desk. A *Find function* retrieves any item from the Pilot's memory instantly, regardless of which application is currently in use.

The *Pilot 1000 model* is equipped with 128K of memory, enough to hold about 500 addresses, a year's worth of appointments, 100 to-do items, and 50 memos. For a modest extra cost, the *Pilot 5000 model* provides five times the memory capacity of the Pilot 1000, holding approximately 5000 records. Both models run for eight to 12 weeks on *two AAA batteries*.

A variety of *accessories* are available for the Pilot connected organizer, ranging from memory upgrades and cables to stylish leather cases.

The Ultimate Handheld Operating System

When the Palm OS was originally developed, the chief design goal was to make the palmtop organizer a direct extension of the desktop PC. Consequently, every line of code in the Palm OS was written with handheld computing in mind.

The Palm OS running on the Pilot organizer provides a number of key benefits for users, described below.

Unparalleled Performance and Efficiency

The Palm OS can access an application or retrieve data almost instantaneously. Built on a low-overhead database model instead of the traditional file system model, the Palm OS's memory manager stores related records directly in memory. No separate storage medium and time-consuming memory buffering are required.

The Palm OS works with small chunks of data organized into "databases" that can be distributed throughout the memory space. These databases are accessed right where they reside for quick additions, deletions, and modifications. In the same way, the system executes applications directly out of ROM or RAM.

Low Power Usage

The Palm OS minimizes power consumption with efficient power management. Pilot stays in running mode only long enough to process user input, then reverts to energy-saving idle mode. When there is no activity for several minutes, the device automatically enters sleep mode, during which the display is blank and most functions are not powered. Any user activity immediately returns the device to running mode.

Small Device Optimization

To ease information input, the Palm OS offers a choice of standard keyboard, on-screen keyboard, and pen-based data entry. With Graffiti power writing technology, the writing area on the screen has been scaled to approximately one square inch. The system also supports user interface elements that allow developers to design clear, compact user interfaces with a minimum of 160 by 160 available pixels.

Integrated Organizer-to-PC Data Sharing

The Palm OS lets users synchronize data between devices without having to perform burdensome set-up procedures. A synchronization manager application running in the background on the PC enables one-button, single-point synchronization. Status flags and record IDs make record matching and modification more efficient, which in turn reduces processing time.

Extendibility To Popular PIMs

The Palm OS provides an open synchronization architecture that uses the HotSync application to exchange data between the Pilot and third-party PIM applications. To synchronize data between the Pilot and a PIM residing on the PC, the operating system employs plug-in software modules called conduits. Conduit software for several popular PIMs is available as an option, or IS developers can create their own conduits.

A conduit synchronizes any of the databases residing on the Pilot with any information in a PC data file. For instance, a conduit might synchronize the most current Pilot To Do List with a Microsoft Schedule+ to-do list on the desktop, or on a network server.

The IntelliSync for Pilot software package, available from Puma Technology, Inc., provides seamless synchronization between Pilot and a wide range of Microsoft Windows and Windows 95 based PIM applications. PIM products currently supported by IntelliSync for Pilot include:

- Microsoft Schedule+ 7.0
- Sidekick for Windows 1.0, 2.0
- Sidekick 95
- Lotus Organizer 2.1
- Day-Timer Organizer 2.0
- Now Up-To-Date for Windows 1.0
- ECCO 3.03

Additionally, Now Software has created a conduit for its Now Up-To-Date product, and Tele-Sync is shipping a conduit for Goldmine.

U.S. Robotics is working with a number of software providers to ensure interoperability with diverse PIMs and contact managers.

Transparent Communications

Palm OS conduit developers don't have to worry about low-level communications protocols. The system's synchronization manager can run transparently across a variety of communications media, including a serial connection and a modem. A wireless capability is planned for the future.

Integrating Pilot Into the IS Infrastructure

When it comes to installation and support, Pilot is a non-invasive addition to the enterprise's information system infrastructure.

Pilot is 100-percent compatible with the Windows and Windows 95 desktop environments and, later this year, the Macintosh. In the future, Pilot-to-PC and Pilot-to-server synchronization will also be supported over both local and wide area networks using standard networking protocols.

Off-the-shelf conduit software makes it easy for IS staff to integrate Pilot into the existing work environment. The conduits allow Pilot to interoperate with a wide range of popular information management products without the need for additional programming, cabling, or other IS intervention.

Do-It-Yourself Conduits

If they prefer, IS groups can create their own custom conduits using familiar Windows and Macintosh development environments and tools.

On Windows 95 or Windows NT development platforms, new conduits may be developed using Microsoft's Visual C++ programming environment and Microsoft Foundation Class (MFC) libraries. The Pilot OS Conduit SDK contains all the Windows libraries and source files necessary to build Windows conduits, which run as Windows DLLs.

Simplified Application Development

Developers can write new applications for Pilot that are launched from icons, or they can re-program the control buttons on the Pilot by having new applications override the default functions. This customization capability makes Pilot ideal for tailoring the device for corporate applications.

To create new applications for Pilot, the developer uses the Macintosh-based Metrowerks CodeWarrior for Pilot package, which includes the CodeWarrior Integrated Development Environment and Palm OS Client SDK tools. A Windows-hosted CodeWarrior for Pilot package will be available by the end of 1996.

How Pilot-to-PC Synchronization Works

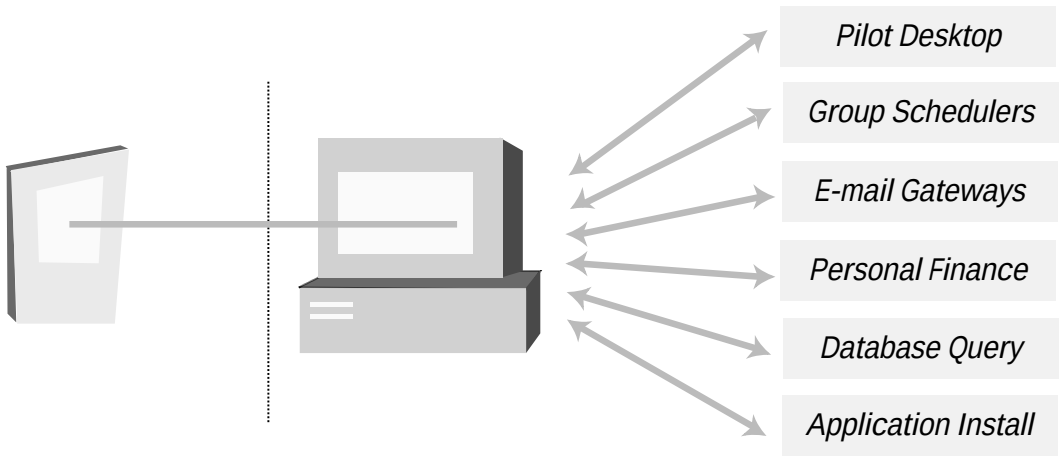

Figure 2. Conduit software integrated into the Palm OS operating system allows Pilot users to synchronize data with their desktop PCs quickly and transparently.

The Palm OS correlates data between the Pilot organizer and the desktop PC in a matter of seconds using synchronization manager software running in the background on the desktop device. Every time users synchronize information, they're simultaneously backing up all their personal data.

When the Pilot user pushes the HotSync button, a wake-up packet signals the synchronization manager to run each conduit program in the system. The various conduits synchronize the Pilot databases with the associated PC data.

Conduits accomplish this by using application program interfaces (APIs) to make calls during the synchronization process that open and close databases, retrieve records, write new records, and perform various other operations.

In a typical synchronization procedure, the conduit software:

- Retrieves all new, modified, deleted, and archived records from the Pilot
- Updates the PC, adding new records and modifying existing ones that have not previously been changed
- Synchronizes all changed records on the two devices
- Deletes or archives all records on the PC that were deleted or archived on the Pilot
- Readies both devices for the next synchronization by clearing status flags and record IDs

How Pilot-to-PC Synchronization Works (continued)

Data records on the Pilot and the PC don't have to be mirror images of each other. For example, data from a Memo record in the Pilot might be directed to a specific cell in an Excel spreadsheet running on the PC. Or a conduit might be set up to upload transaction data from a Pilot check registry to a PC-based finance database, then download the new balance to the Pilot.

Designed for Maximum Efficiency

The Palm OS provides built-in functionality that makes Pilot-to-PC synchronization markedly more efficient than other synchronization methods. If a record in any of the small databases residing in Pilot memory has changed since the last synchronization, that database is flagged. The synchronization process bypasses any database lacking an attribute flag in its header.

This technique is quicker and more reliable than the usual method of having the system examine date and time stamps on data files one by one to determine their status.

A header in each Pilot record contains status information that tells the system whether the record's status is old, new, modified, deleted, or archived. This limits the amount of data sent to the PC. Only the new or modified records are transmitted for synchronization, not entire files.

In addition, each record in the Pilot has a unique record ID that matches a record stored in the PC. By using concise ID information for matching instead of comparing key fields in the records, the Palm OS cuts down on processing time and eliminate synchronization errors.

Pilot also provides a built-in archive function for backing up historical information. During synchronization, the system copies records the user has marked for archiving into a special archival file on the PC. The archived data is then removed automatically from the active files in both the Pilot and the PC.

Power Writing with Graffiti

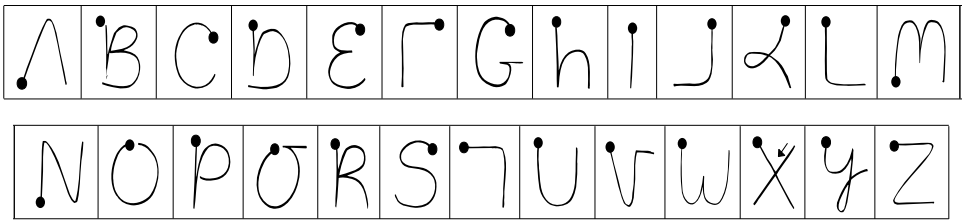

Figure 3. The simplified Graffiti character set makes entering data with a stylus smooth and virtually error-free.

The Graffiti power writing system gives users a fast, accurate, frustration-free way to take notes and enter information into the Pilot connected organizer. It puts a powerful tool for collecting, manipulating, managing, and communicating information in the palm of your hand.

Graffiti is pen-based character recognition that really works. Studies show that users learn Graffiti in less than 20 minutes, and can master it in about two hours. Users are then able to write up to 30 words per minute with nearly 100-percent accuracy.

U.S. Robotics simplified a few letters of the alphabet and punctuation marks to dramatically increase speed and accuracy. With Graffiti, the computer is never “fooled” by an individual writing style or similar-looking characters. Everything you enter with the Pilot’s stylus is immediately echoed as text on the display, giving you immediate visual feedback. You revise the text by simply backspacing and re-entering characters

The Graffiti system allows you to write characters one on top of another in a special area of the display. This not only conserves screen space, it also means you don’t need to look at the screen while you’re taking notes. And with the unique letter and number writing areas, it’s impossible to mix up letters and numbers (for instance, entering the letters IS when you meant to write the number 15).

What’s more, Graffiti ShortCuts lets you build your own custom library of frequently used text blocks that can be inserted into the main text with a few stylus strokes.

Future Communications Enhancements

Pilot and the Palm OS provide a solid platform for future enhancements designed to extend the organizer's reach and capabilities. Memory or software in any Pilot purchased now can be easily upgraded by means of a new circuit card — which users can insert themselves.

Internet access and remote access links are becoming increasingly important for handheld devices as corporate networks add mobile communications support for their users. The infrastructure will soon be in place to provide a broad base of users with reliable, cost-effective services.

As a global telecommunications leader, U.S. Robotics has access to best-of-class technologies in these areas, and can be expected to evolve the Pilot to include robust communications functionality as demand warrants.

For example, development is now underway on software that will provide direct, two-way connections between Pilot and major e-mail systems, without requiring any software changes at the e-mail server itself.

The Complete Connected Organizer

Because it's always in sync with your PC, Pilot combines the convenience of a handheld organizer with the power of desktop computing. In other words, it's the organizer for computer users — a mobile extension of the electronic desktop that lets you take your PIMs with you. And at less than $300, Pilot fits your budget as well as your pocket.

But the best way to discover how Pilot can enhance your own productivity is to try it. To arrange a demo, call 1-800-881-7256 or visit the U.S. Robotics/Palm Computing World Wide Web site at http://www.usr.com/palm.

Corporate Profile

Palm Computing, Inc., a subsidiary of U.S. Robotics, is a leading provider of handheld computing systems. Headquartered in Los Altos, California, Palm Computing designs, develops, and markets handheld computer products that include the Palm OS, the Pilot family of connected organizers, personal information management applications, handheld-to-desktop computer connectivity software, and Graffiti power writing technology.

U.S. Robotics is one of the world's leading suppliers of products and systems that provide access to mission-critical information. The company designs, manufactures, markets, and supports remote access servers, enterprise communications systems, desktop/mobile client products, modems, and telephony products that connect computers and other equipment over analog, digital, and switched cellular networks — enabling users to gain access to, manage, and share data, fax, and voice information.

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