

THE

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HP Palmtop Paper



PC CARD

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Pen/pencil holder		1	1	1	2		2
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Pockets for PCMCIA I & II, business, or credit cards						10	12
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Publisher's Message



Top: Hal Goldstein
Bottom: Robert Roney and Rich Hall

Welcome to our first annual bonus *HP Palmtop Paper* PCMCIA issue — *PC Card Review*.

Before a new standard can take hold there must be a sufficient market to justify it. The PCMCIA committee, PCMCIA card vendors, and PC Card customers owe HP and HP Palmtop owners a thank you. HP helped pioneer and legitimize the PC Card concept with the introduction of the HP Palmtops and HP OmniBook. The 100,000's of HP 95LX users in the marketplace, each with a PCMCIA slot wanting to be filled, helped create the PCMCIA storage market. Thanks to the PCMCIA committee (of which HP was a founding member), enhanced standards keep emerging. Now, not only is it possible to store up to 80 Megabytes of data on a PC Card in your palmtop, but that same HP

Palmtop slot can be filled by a wireless receiver or a fax/modem.

We divided this issue into three sections, Primer, Previews, and Products. HP Palmtop and PCMCIA Card expert Mark Scardina wrote much of the Primer section. We made current a number of Mark's past articles about PC Cards and data compression, and we published an important new article from Mark about PC Card Drives for your desktop. PC Card drives allow you to transfer files easily between your desktop and your HP Palmtop. However, nothing is free, and you will read about a number of options with different tradeoffs. I conclude the Primer section with 15 recommendations to assist you when purchasing a PCMCIA related product.

In the Previews section we take a specific look at PCMCIA applications. Well-known PCMCIA visionary Portia Isaacson guest-writes an article about combination cards and the new Smart Modular fax/modem/memory card. Also in Previews we look at HP StarLink wireless messaging, the Accurite PCMCIA / 3.5" floppy drive, the ThinFax fax/modem, cellular fax/modem combinations, and more. Finally, read about the fascinating possibilities for using the HP Palmtop and a PC Card to collect, monitor, and process information in the health, military, manufacturing, and field service professions.

In the Products section we did our best to list all known PCMCIA products that work with HP Palmtops. Except when noted, the vendor of each product verified that its PC Card worked with an HP Palmtop. For those who haven't mastered the PCMCIA jargon, please refer to the glossary at the end of the issue.

It will be fun to watch the growth of the PCMCIA industry and monitor new palmtop possibilities in future *PC Card Reviews*. Such developments are important to HP Palmtop users, for a PC Card in the HP Palmtop gives the Palmtop new potentiality, new possibilities, a new personality.

Hal Goldstein

The HP Palmtop Paper

INCREASING YOUR
PERSONAL POWER
BY EXPANDING YOUR
PALMTOP'S POTENTIAL

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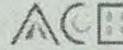
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PCMCIA -- Setting the Standards for PC Card Technology



If you've ever wondered what the PCMCIA organization is, what it does and how it effects you, read on.

By Steven R. Magidson

Many of us are aware of PC Card (also called PCMCIA) technology, and the benefits it brings to those of us who rely on portable PCs for our daily work. The convenient credit-card-sized PC Card devices available today include high-speed data/fax modems, LAN adapters, sound cards, SCSI adapters, flash memory cards, rotating storage devices and more, all designed to make life easier and more productive for

mobile professionals. Behind all this is the PCMCIA committee. In this article we will briefly look at the PCMCIA organization itself, what it has done, what it's doing now, what it will do in the future, and how it effects us.

PCMCIA (Personal Computer Memory Card International Association) is the non-profit 500+ member international association that sets the standards for the PC Card technology that is being so widely embraced today (HP is a founding member of PCMCIA). It's also the trade association that promotes the technology to the market bringing broader awareness to users, resellers, analysts, and vendors at trade shows, symposia and the like. And while we may think of PC Card technology as being new, in September 1994 PCMCIA will celebrate its fifth anniversary of operation.

Setting PC Card Standards

PCMCIA standards increase the potential market for a developer. Standard PCMCIA sockets in a variety of computers make it possible for more companies to develop a single product for a variety of computers. This keeps profits up for the developers and retail prices down for the end user.

Setting standards has been a major activity for PCMCIA, and it will continue to be a key focus of the organization in the future. The standards that PCMCIA publishes allow the rapidly growing number of card, platform, and software vendors to develop products that are not only compatible, but interoperable as well.

Compatibility is concerned more with making sure that the PC Card product works properly in your specific environment. In other words, does the PC Card modem, LAN adapter, etc. work properly with your HP Palmtop or other specific portable PC, and does the PC Card device work with the version of Card and Socket Services that you have?

Interoperability is concerned more with having the PC Card product

work in a variety of diverse environments. For example, can you use your PC Card modem in the DOS environment of your HP Palmtop as well as an OS/2 environment and even a MAC environment.

Among the compatibility issues are the following:

- Making sure that the power requirements of the PC Card do not exceed the available power of the portable PC in which it is to be used (e.g. at present, devices such as high power token ring LAN adapters do not work in a handheld device like the HP Palmtop that is powered by a couple of AA batteries).

- Making sure that the revision of the software (called "Card & Socket Services") that you have on your computer is compatible with the PC Card to be used.

- Making sure that the PC Card and your platform support the specific features that you might want to use (e.g. HotSwapping), and that if you are using multiple PC Cards, they can operate properly together in the same system at the same time.



ABOUT THE AUTHOR

Steve Magidson is an independent consultant and freelance journalist specializing in the areas of portable computing and mobile networking. Mr. Magidson is also a member of PCMCIA and serves on the Association's board of directors. He can be reached on CompuServe at [72727,3205].

With the wide range of applications to which PC Card technology is being applied, insuring compatibility and interoperability has been no small feat. The standards have evolved from the initial version in 1989 that supported only memory cards (hence the organization's name: Personal Computer *Memory* Card International Association), to the current version which supports the full I/O capabilities required by today's PC Card products (e.g. fax/modem cards and wireless receivers). Without such standards, it would have been virtually impossible to achieve this goal with any degree of compatibility or interoperability.

PCMCIA's job is not done

While the current standards have done a lot to promote compatibility, there are issues that still need to be resolved. The next version of the PC Card Standard, due out later this year, will include new features and guidelines intended to minimize these issues.

Technology doesn't stand still and users' needs continue to grow. As a result, the Association is reviewing proposals for additions to the standard that will provide better support for multifunction I/O cards (e.g. LAN and data/fax modem, SCSI and sound, etc.), low power (3.3 volt) cards and platforms, a new 32-bit bus mastering interface, and more. The current PCMCIA Standard (soon to become the PC Card Standard) supports 16-bit operations. The proposed 32-bit bus mastering interface, called CardBus, would allow 32-bit operations with maximum performance rates 4 times, or more, higher than the current standard. This will not have a major impact on many of today's applications such as modems and 10Mbps Ethernet, but it will become more important for high bandwidth multimedia applications, 100Mbps Ethernet, and other applications that require large amounts of data to be transferred.

While keenly aware of the need

for backward compatibility, the Association and its members also understand the need to evolve the standard over time to keep pace with the rapid technological advances we continue to enjoy. It's a delicate balance that requires the active participation of the member companies. Evolving the technology in a standards-based environment is an ongoing process, and will provide users with a continuous stream of new cards, platforms and software that work together to solve the growing and changing needs of the marketplace.

While we seem to enjoy the PC Card products themselves, it's important to remember that there is a large international organization operating in concert and whose standards form the framework for these products, both now and in the future. PCMCIA has come a long way in a relatively short time, and there's more work yet to be done.

[See page 50 for information on PCMCIA newsletter, on-line bulletin board, and contact information.]

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The Use of PCMCIA Cards in HP's Palmtop PC Computers

By Mark Scardina

PCMCIA: Background

The *Personal Computer Memory Card International Association* (PCMCIA) is a non-profit trade association and standards body founded in 1989 and comprised of over 500 member companies. Its purpose is to define the industry standard for PC Card technology.

The first PCMCIA PC Card Standard (1.0) was released in 1990 and defined the physical and electrical characteristics of a credit-card-sized device that could be used as memory or as a disk in a computer. This standard not only defined the physical specifications of the card, but its use as a data storage device as well. Since HP was on this standards committee, the HP 95LX ultimately came to market with a PCMCIA card slot that met, for practical purposes, the 1.0 standard.

The PCMCIA committee subsequently introduced the 2.0 standard about a year ago. This release broadened the card specification with the addition of input/output (I/O) and execute-in-place capabilities, allowing the development of mass storage, modem/fax, LAN, cellular and radio frequency communications peripherals in the PCMCIA card format. The 2.0 standard was introduced in time to find its way into the HP 100LX.

The first I/O cards available for the 100LX were fax/modems cards. Subsequently, data collection cards (see page 44), a barcode system (see page 44), and floppy disk drive with PCMCIA interface (see page 46) have been introduced. Developers are working on other devices for the HP 100/200LX, including VGA adapters, LAN interface cards, global positioning system cards, and SCSI adapters.

Type II; Version 2.0: What's the difference?

PCMCIA 2.0 capability must not be confused with Type II capability. In the PCMCIA standard, "Type" refers to the thickness of the card with Type I equal to 3.3mm, Type II equal to 5mm and Type III equal to 10mm. Both the HP 95LX and the HP 100/200LX can accept up to Type II cards. However, only the 100/200LX has the Release 2.0 standard capability.

PCMCIA Memory Cards

With the exception of the New Media PalmModem Fax/Modem card, the only function that you can use PCMCIA 1.0 cards for on the HP 95LX is file storage. Read-Only-Memory (ROM) cards, Static-Random-Addressable-Memory (SRAM) cards, and Flash-Random-Addressable (Flash RAM) cards were developed for this purpose.

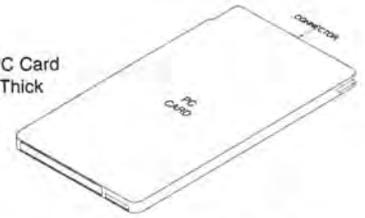
Read-Only-Memory (ROM) Cards

ROM cards have been available since before the introduction of the HP Palmtop. They are the least expensive form of memory card, but are read-only and cannot be written to. ROM cards are most suitable for storing software programs or data files that do not need to be changed.

A software program on a ROM



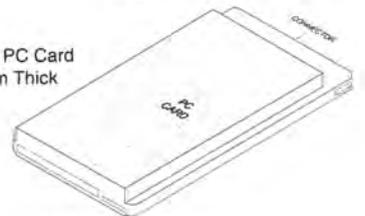
Type I PC Card
3.3 mm Thick



Type II PC Card
5.0 mm Thick



Type III PC Card
10.5 mm Thick



Type I, II, and III PCMCIA cards

card can be installed simply by inserting the card into the HP Palmtop, eliminating the need of a disk drive or file transfer from another computer. The ACE Gamecard, Personal Food Analyst, Derive, HP's Dictionary/Thesaurus card, and the GlobalLink Language Translation

ABOUT THE AUTHOR

Mark Scardina is a regular contributor to the HP Palmtop Paper. He is Senior Product Manager for ACE Technologies. He is also the Sysop of the HP Handhelds and Omnibook forums on CompuServe and the author of numerous utility programs for the HP Palmtops. His CompuServe ID is [76711,732].

cards and a whole series of cards from Pocket-Consultant are examples of software programs on ROM cards (see PCMCIA Products, page 38).

Most HP 95LX software was not available in this form because the cost of ROM cards was still 50 to 100 times that of a floppy disk. However, more and more software is being made available on PCMCIA cards.

ROM cards are more stable than their writeable counterparts. The software program is "etched" permanently into the card's microchips and can never be altered or lost through any action, short of physically destroying the card.

Static-Random-Addressable Memory (SRAM) Cards

SRAM cards were the most popular card storage technology used on the HP 95LX. While SRAM cards are still expensive when compared to floppy and hard disk technology, SRAM prices have plummeted in the past couple of years.

SRAM's memory is retained by the presence of a battery. The lithium backup batteries used in the cards provide a one year life.

The recommended procedure is to change SRAM card batteries every 10 months. Set a 10-month reminder in APPT and change the battery whether you've received a low battery warning or not (see sidebar for changing SRAM backup batteries). [Note: See page 39 for information on Magic RAM and Premax's SRAM cards with dual backup batteries, and Centennial's ReCharge SRAM card, which comes with a built-in rechargeable backup battery.]

SRAM cards are the fastest of all the memory cards, especially when writing to them. They have virtually an infinite life with no drop off of performance over time. They also are both readable and bootable without the need of an additional software device drive. This is a distinct advantage on the HP 95LX as it is possible to lose the data and programs on your C: drive. Since a SRAM card can always be read, you can keep

your startup files (CONFIG.SYS and AUTOEXEC.BAT) on it and boot from the SRAM card to recover from a C drive crash (insert the SRAM card in the memory card slot and press **CTRL-ALT-DEL**). Finally, SRAM cards can be easily interchanged among other computers with RAM card slots that support any level of the PCMCIA standard. Memory card drives are available that connect to your desktop or portable computer and allow them to access your card's data quickly.

Although SRAM cards exist in capacities from 64K to 4MB, practicality and cost considerations limit the availability of some sizes. For the HP Palmtops, 512K, 1MB and 2MB cards are readily available. In addition, compression software is available to increase the capacity of the card. Stacker from Stac Electronics, DoubleCard from ACE Technologies and DIET  (freeware) all can provide up to twice your physical storage space.

Flash-Random-Addressable (Flash RAM) Cards

Flash RAM cards are similar to SRAM cards in that they are comprised of computer chips that can be

Changing a SRAM card backup battery

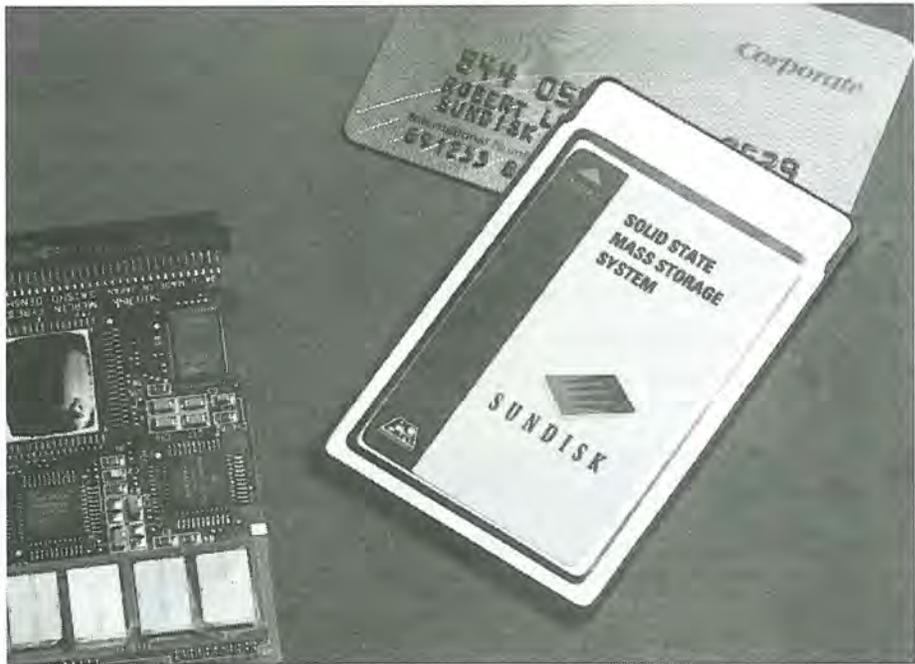
If you see a LOW CARD BATTERY message on the Palmtop, your SRAM card has just lost, or is about to lose all its data! If the message appears, leave the SRAM card in the card slot and do NOT turn the Palmtop off - keep it on! The main batteries will supply enough electricity to the card to prevent any further damage.

Connecting the Palmtop to the AC adapter disables the auto-shutoff feature and gives you all the time you need to change the battery. If you don't have access to AC power when you need to change the battery, you have three minutes before the Palmtop powers down and cuts the power to your card. You can press a key every minute or so to keep the Palmtop from powering down. You can also disable the autotimeout by using SWITCH! or 95/100BUDDY , or TIMEOUT .

Slide the lock lever at the end of the card to the unlock position and remove the little battery tray. Pop the battery out and replace it with the proper back up battery (a 3-volt CR-2025 coin cell for HP cards). Make sure the positive (+) side of the battery is sitting up in the tray. For more on changing card batteries, check your User's Guide.

*Ed Keefe
CompuServe ID: [75300,3667]
Dave Snellard
CompuServe ID: [100064,1525]*

written to and read from. However, they have two big advantages over SRAM cards. First, they do not need a battery to retain their data. Second, they can have very large capacities. The largest capacity card for the HP



SunDisk ATA flash card, internal/external

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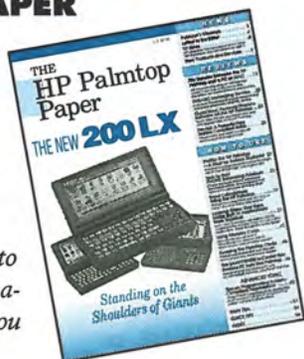
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Palmtop is the SunDisk 40MB card (80MB with file compression). SunDisk and NEC are jointly developing 256Mbit flash technology that will eventually lead to 500MB cards in the late 1990s. The larger Flash RAM card capacities yield the cheapest cost-per-megabyte of storage ratios.

SunDisk was the first company to introduce a writeable Flash RAM card for the HP 95LX. Until recently they were the manufacturer for all ATA flash cards marketed under a variety of names, including HP. These cards conformed to a supplemental PCMCIA-ATA standard that allowed them to appear as more conventional IDE hard drives to the HP Palmtops or a PC.

SunDisk achieved a tremendous technological feat with its flash cards. However, there are some points you should keep in mind.

First, the card is not readable or bootable on the HP 95LX without a "device driver" (small software program) already running. This is not

Can flash cards wear out?

There is quite a bit of misinformation about FlashRAM cards "wearing out." The card does not wear out and stop working after a while. The card is made up of 512 byte sectors just like a hard disk is. In fact, the interface between the Palmtop and the card (ATA flash disks) looks (to hardware & software) just like an ATA hard drive. It is these individual sectors that are subject to "wear", not the whole card.

Also the term "wear" is a bit misleading. After something like about 100,000 writes, a sector will tend to take longer to do a write cycle than it did when it was "fresh." Some engineer decided that a write cycle that takes longer than some specific amount of time is considered too slow and the sector is "worn out." I'm not sure whether the ability to write to the disk eventually completely wears out or just becomes prohibitively long. However, you will always be able to read from the Flash disk. I have recently heard of a new Flash card being developed that does not need to have wear leveling run on it. So, maybe someone has licked that problem altogether?

There is a program that comes with the SunDisk ATA Flash disk cards called WEAR.EXE. This program should be run a few (3-4) times per year (it is not critically important). It writes to each sector on the card and measures the write cycle time. When it finds a spot that is writing too slow, it maps it out as a "bad sector" and maps in one of the many spare sectors already included on the card. Then it puts the data that was in the sector into the new one. If there were no slow sectors, then WEAR does nothing. Run WEAR a couple times per year to be safe. You should close down SysMgr and unmount the Stacked drive before running WEAR. Then reboot afterwards. VERY IMPORTANT: Be sure you have the 100/200LX plugged into a working AC power pack before running WEAR. It can take a couple of minutes and if the heavy duty writing it does kills your batteries, it could corrupt the FlashCard.

I think WEAR may also move data around from sector to sector in an effort to empty the sectors that have been heavily used and put the data into less used sectors. This helps to "load level" the sectors.

Stanley Dobrowski
CompuServe ID: [71031,2162]



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much of a problem, unless your HP 95LX's C drive corrupts or is otherwise lost. SunDisk users might want to carry an additional SRAM card with the files necessary to reinstall the SunDisk device driver — just in case! IBM's new ATA flash cards will not work on the 95LX.

HP 100/200LX users have the necessary device drives built in and do not have to worry about this. It should be noted that the device drivers used are specific to the particular PC or palmtop. If you want to use the SunDisk card in another notebook's or desktop's memory card drive, you have to first get the appropriate device driver. (Most devices currently manufactured can read SunDisk cards.)

Second, Flash RAM cards, while having a virtually unlimited read life, have a long but limited write life. That means that there is no limit on how many times you can access data. However, there might be a limit on

how many times you can change data. Flash RAM write life has been greatly increased through improvements in the memory chips used in the cards and software incorporated to detect failing sectors. Claims have been made that a typical user need never worry about losing data due to a write life problem. (At the time of this writing, SunDisk and HP provide a one year warranty on their ATA Flash cards. ACE has a lifetime warranty on its DoubleFlash cards and five years on its DoubleFlash+ cards.)

Finally, it takes a little bit longer to write to a Flash RAM card than it does to a SRAM card. This is because it takes a small amount of time for a Flash RAM card's write circuitry to come out of its "sleep" mode (necessary to allow the card to have similar power consumption as a SRAM card). I didn't notice additional write time in daily use, with compression software installed on my card.

Selecting the right memory card

The wide variety of SRAM and Flash RAM memory cards now available makes choosing a card a little difficult. Your first task is to determine the minimum storage requirements for your system. While it is true that you can never have too much space, RAM cards are far more expensive than mechanical drives. Let's assume for this discussion that your space requirements do not rule out the smaller SRAM cards.

Cards for the HP 95LX

1. If you are going to use your cards on the HP 95LX, then you should choose between the SRAM cards and the SunDisk 5 volt ATA flash cards based on your storage requirements and budget.

2. You should make sure the flash card comes with a software driver that supports the HP 95LX.

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3. The 95LX driver that comes with the card needs to be kept on HP 95LX's C drive. If you damage your C: drive you will not be able to use the card until you can replace it either from another card or a PC.

4. Hewlett-Packard sells a 5MB ATA flash card that includes Stacker compression software.

5. ACE DoubleFlash cards come in different sizes with a special software driver that increases the write speed of the card up to 30% over the standard SunDisk driver.

6. The 5 volt DoubleFlash cards are available with an optional ROM card that you can carry to restore the driver. Overall, Flash RAM cards are slower than the SRAM cards when you are saving files over 100Kbytes; therefore, the increased storage does come at a performance price. Both the HP and ACE cards are provided with Stacker compression software.

Cards for the HP 100/200LX

The HP 100/200LX makes card selection easier because no special software drivers need to be installed for either SRAM or ATA flash cards. The faster processor also reduces the impact of using Stacker compression software. However, there are some considerations. The HP 100/200LX can use both the 5 volt and 12 volt FlashRAM cards (the 95LX cannot use 12 volt cards).

The 12v cards provide speeds that are effectively equivalent to SRAM and the battery drain on the HP 100/200LX while reading a card is relatively low (equivalent to a SRAM card at about 60ma). However, writing to a 12V Flash RAM card consumes 220 ma. during that process.

Twelve volt cards are no longer sold because the newer 5v FlashRAM cards are almost as fast and have a lower (60 ma) Read/Write current, making them easier on the HP 100/200LX's system batteries. (The ACE Double-Flash cards add a driver that provides the 5v cards with variable

PCMCIA Notes from HP

PCMCIA cards that can be used on the HP Palmtops

[Thanks to HP Mobile Computing Customer Support, phone: 503-757-2004, fax: 503-715-5488, for this information.]

PCMCIA CARD TYPES

Type I, II, and III refer to the physical dimensions of the PCMCIA card. Both the 95LX and 100LX can physically accept Type I and II (5mm thick) cards. Neither can accept a Type III (10.5 mm thick) card.

PCMCIA CARD VERSIONS

PCMCIA Release 1.0 is the standard covering memory cards only, mainly battery-backed cards. PCMCIA Release 2.0 is backward compatible with Release 1.0, allowing use of memory cards. Release 2.0 also covers I/O cards (such as fax/modems, wireless transmitters and receivers, etc.).

The HP 100/200LX can handle Releases 1.0 & 2.0 cards. However some Release 2.0 cards draw too much power and will not work with the 100/200LX. (The 100/200LX can only handle cards that require a maximum of 150 milliamps of power at 5 volts.) The 100/200LX works with many SRAM, flash RAM, ATA, fax/modem, wireless receivers, and other PCMCIA cards.

The HP 95LX can handle Release 1.0 (Type I & II) cards and Release 2.0 (Type I & II) memory cards. The 95LX works with many SRAM cards, ATA flashRAM cards, and one custom designed fax/modem card (PalmModem by NewMedia).

Using a PCMCIA Card Modem with the HP 100LX

This procedure shows how to prepare the HP 100LX for using a card modem. This procedure is not needed on the HP 200LX. Additional information is given on using cc:Mail with certain card modems.

1. If you do not have existing AUTOEXEC.BAT and CONFIG.SYS, copy them from the 100/200LX D drive to the C drive.
2. Open AUTOEXEC.BAT in MEMO.
 - A. If you copied it over from D:, delete the letters REM from the line
Rem d:\bin\cic100 /gen1.
 - B. If you had an existing AUTOEXEC.BAT file, add the line
d:\bin\cic100 /gen1 before the last line.
4. Press **F10** to save the modified AUTOEXEC.BAT file.
5. Close all applications.
6. Press **CTRL-ALT-DEL** to reboot the Palmtop.

The HP 100LX should now be ready to use the card modem in the built-in applications. Remember that the PCMCIA card port is the COM2 port. You must configure Datacomm or cc:Mail to send/receive via COM2.

Getting cc:Mail to work with PCMCIA card modems

Certain card modems require the settings in cc:Mail to be altered. If cc:Mail does not seem to connect or download messages when using a card modem, try the following:

1. Copy HAYES.MDM from D:_DAT to C:_DAT.
(Optional: only cc:Mail users with problems need to do this.)
2. Open c:_DAT\HAYES.MDM in Memo.
3. Type Rem in front of the two lines that begin with SETUP.
4. Insert the following new line: setup=at&f&c1&d2&k3&s1&q5w0
This is a typical command string that works with some modems. Your modem may require other settings. See your cc:Mail Systems Administrator for the modem settings for your system.
5. Press **F10** to save the file.
6. Go back into cc:Mail and press **MENU** **C**onnect **S**ettings, tab to the **Modem File** text box, enter C:_DAT\HAYES.MDM and press **ENTER** to update the file.

You're now ready to go back to cc:Mail and attempt to use the modem card with the new modem setup.

speed. If your batteries have a good charge remaining, or if you are connected to the AC adapter, the speed increases by approximately 30%.)

HP and other companies sell versions of SunDisk's ATA FlashRAM cards, which usually include Stacker, which effectively doubles their capacity. For a more complete listing, see PCMCIA Products, page 38 this issue.

You should be aware that a 12 volt card is unusable in the HP 95LX as well as external card drives that do not support 12v. (The Databook TMD 550 and 201 can read but not write to a 12v card.)

Finally, I recommend that you use high quality NiCds (>700mah) or Nickel Metal Hydrides with the HP 100/200LX when using any of the FlashRAM cards. These batteries are better able to handle the current surges and are less likely to reboot your machine if you inadvertently insert the FlashRAM card with the power on.

Using SRAM and Flash RAM Cards

There are some general points that pertain to memory cards, regardless of the kind you are using.

HP 95LX Tips

1. Store your data files on a Memory card, especially if you're using an HP 95LX. It's easy to lose C drive data on the 95LX. On my system, data resides on my memory cards and programs on the C drive. If my C drive files become corrupted, I can replace them from program installation disks.
2. On the HP 95LX put all of your start up files, CONFIG.SYS, AUTOEXEC.BAT, etc., on your memory card(s). Should you make an error in one of these files that prevents your 95LX from properly booting up, you can simply remove the SRAM card, press **CTRL-ALT-DEL** and have a working 95LX again.
3. WARNING: If you plan on purchasing a notebook PC that comes

with a PCMCIA card slot, beware! You may not be able to read a HP 95LX-formatted memory card in it. Take a 95LX-formatted RAM card with you and test it out on the notebook you're looking at. If it doesn't work, make sure a device driver IS AVAILABLE that will allow the notebook's card drive to read a 95LX-formatted card. Many of the popular notebooks don't have these device drivers available.

PC memory card drives

Flash and SRAM cards provide easy data exchange and backup capabilities. A PC Card drive can be added to your desktop PC. It lets your desktop PC read RAM cards like it would read a floppy disk. It is far quicker and easier to slip a PCMCIA card out of your Palmtop and into a PC Card drive than it is to connect your Palmtop up to your PC and run file transfer software. (See the article on card drives beginning on page 15. Also see PCMCIA Products, page 38, for listings of card drives.)

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Memory card not DOS "system disk"

Many PC users are familiar with creating bootable disks for their PC, using the DOS `format /s` command. You don't have to try and turn the RAM card into a "system disk" to boot from it. You don't need any hidden files or `COMMAND.COM` (it's launched from ROM). If you have your `AUTOEXEC.BAT` and `CONFIG.SYS` files on the SRAM card, in the card slot, whenever you press **CTRL-ALT-DEL**, you'll boot from the A drive.

Change the Backup Battery Every Ten Months

Static Random Access Memory (SRAM) card's only limitation is that their data is preserved through the use of a lithium backup battery that keeps the microchips in the card "alive." These batteries (CR-2032) generally last for a year and are cheap enough, costing about \$3.

Power is supplied to the card by the Palmtop only when the Palmtop is on. If the card is removed or your Palmtop is off, the card's memory is preserved by its internal battery. Even though a card battery may last a year, change the battery more often.

The HP 95LX was designed before the current series of SRAM cards. The Palmtop cannot respond to the intermediate low battery signal that the newer SRAM cards deliver when getting low on battery power. Instead it can only respond to the final low battery signal sent by the card. This is a point at which your SRAM card may lose its data. It is my recommendation that the SRAM cards backup battery be changed ten months after it was installed, regardless of its condition. Set an APPT alarm reminder.

This problem has been fixed on the HP 100/200LX.

What do you do if you get a low card battery warning on any HP Palmtop?

The first thing to do is to try and keep the HP Palmtop on. Immediately connect it to the AC Adaptor or turn off its timeout function using programs such as `TIMEOUT`, `SWITCH!`, `95BUDDY` or `100-BUDDY`. Many SRAM cards will then let you replace the card's backup battery while it is still in your Palmtop. A little slide lock or screw

holds the retaining ring for the battery. By releasing the ring the battery can be removed. Be sure to note whether the old battery's plus side is up or down and insert the new battery the same way. Also, remember to re-lock the retaining ring to prevent removing it while trying to unplug the card.

Maximize a Memory Card's File Storage Capability

When Memory cards are formatted, they are divided up into storage units called "sectors" and "clusters." Each sector on a SRAM card has 512 bytes. Each cluster has one sector.

FlashRAM cards are too big to have 512 byte clusters. HP/Sundisk cards come with 8K Clusters. ACE cards vary between 1K and 4K.

Any file takes up a minimum of one cluster. A small batch file of a few lines may require less than 50 bytes of storage space. However, it must occupy at least one cluster (512 bytes on a SRAM card, up to 8K on an ATA flash card).

This fact means that it is wasteful to store small files on a SRAM card and almost criminal to store them on an ATA flash card. If you use MEMO to keep scraps of information and save each to a separate file, you're

A Short History of Medical Technology

A) Prehistoric Medicine. Medical technology appeared on Earth soon after evolution of the opposable thumb. From then until the Twentieth Century, medicine was more magic and religion than art or science. The doctor's primary tools were a bone saw, jars of alcohol-based elixirs, a Book of Leeching, and the name of a good undertaker. Rounds were performed on horseback. On the up side, it was all fee-for-service! (Or, more usually, pig-for-service...)



B) Modern Medicine. The discovery of antibiotics and other miracle cures ushered in medicine's modern era. The explosion of scientific knowledge was welcome in the 1930's, manageable in the 1960's, and overwhelming in the 1990's. Today's doctors are pressured to see more patients in less time, with treatment options controlled by a confusing array of formularies and practice guidelines. Malpractice litigation exacts a heavy price for mistakes and oversights. A doctor's most important tools are a Day-Timer, Dictaphone, and a hefty stack of medical references.

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wasting precious space. HP 100/200LX users can use Note Taker to keep scraps of information in one file and save disk space. HP 95LX users can check out programs like fastNOTES, Keep-In-View and NOTES95 to recover that expensive real estate.

Another approach is to use file compression software on your SRAM or Flash RAM cards. You can use DIET or other compression software to reduce the size of individual files before you store them on your memory card. Stacker is particularly effective with larger cards, as much as doubling the capacity of the card (see compression article, page 20).

A final warning: The DIR (directory) command of MS-DOS reports the number of bytes in a given file, not the space actually used. For example, you could write a small, two-line batch file that only needs 50 bytes of storage space. However, since it must occupy one sector, it's really occupying 512 bytes on a SRAM card or up to 8K on an ATA flash card. The DIR command lists 50 bytes as the file size, not the amount of space the file is really taking up. DIR computes the "bytes free" on the disk based on the apparent, not actual file size. With a lot of small files on your disk, it's possible to run out of storage space, even while DIR reports lots of space left.

One last thing: You may have no more than 63 entries in the root directory, A:\, of your card. If you want to store more files on a card, put them in a subdirectory.

PCMCIA I/O Cards on the HP Palmtop: FAX/Modems and more

New Media produced the only non-memory card application for the HP 95LX and its PCMCIA 1.0 standard. Its PalmModem card is a fully functional 2400 bps modem and facsimile. The card contains both fax and modem circuitry as well as communications and fax software in ROM (see product description, page 43).

The PCMCIA 2.0 standard led to the introduction of a large number of

fax/modem cards, many of which work on the HP 100/200LX (see product descriptions, pages 42 to 44). Fax/Modem cards are not self-powered, nor do they draw power from the phone lines. This means that all power must come from the Palmtop. This is an important consideration as a 14.4K modem can easily draw up to 400ma while transmitting. If possible, keep the 100/200LX connected to the AC adapter when using a fax/modem card.

Most modems have three power levels with the highest being when its online. This will generally range from 50 to 200ma. When the modem is in standby or awake mode the current can be reduced by up to 100ma. Finally, there is a sleep mode that will generally be activated after a set period of no activity. Even this reduced current consumption draws 10 to 30ma. Considering this, you should not keep a modem card in the slot when you are not using it.

As mentioned, you should connect the HP 100/200LX to its AC adapter when using the modem card. This prevents premature battery failure and keeps the 100/200LX from timing out and turning off. Whenever the 100/200LX is turned off, you will lose the connection and the modem initialization.

Finally, you should realize that a card modem will take the only slot in the HP Palmtop. As such you will need to store whatever communications software you use on your C drive along with the data you send and receive. Since receiving faxes and E-mail can easily result in filling the rather limited C drive, you should carefully evaluate your planned use before committing to a card modem.

The 2MB versions of the HP 100/200LX are preferable for fax/modem card use because they give you more C drive space for software and data files. Also, there is a new Fax/Modem combination card from Smart Modular Technologies. The Combo Card comes with a fax/modem and up to 4MB of Flash RAM on the same PCMCIA Type II card (see pages 29 or 44 for more info)

Other I/O cards

Other input/output cards are available for the HP 100/200LX. An article on page 31 describes the HP StarLink wireless messaging service, which uses the Motorola NewsCard wireless receiver. A number of other wireless receivers are briefly described on page 32 and 47.

A GPS card is available, but not working with the 100/200LX at this time due to power consumption problems. This card enables the portable computer user to access the Global Positioning System satellites and get his location, speed, and altitude anywhere in the world.

Another article on page 33 describes data acquisition cards, which allow a portable computer user to collect input from analog and digital sensors (measuring temperature, pressure, the number of times a door opens, etc.) via a portable computer. By the time you read this article, these cards should be working with the HP 100/200LX.

LAN adapter cards have been available for a while, but have not worked with the Palmtop because of power requirements. Hopefully, the recent development of low power chips may lead to a functional LAN card for the HP Palmtop.

A new Travel Floppy drive with PCMCIA interface is described on page 36. It lets the HP 100/200LX access files on 3.5" floppy disks, but must be connected to its AC Adaptor to operate. Accessing data files from the drive slows down the operation of applications on the Palmtop. Also, make sure the switch in the back of the Travel Floppy is set to operate off the AC adapter, or you'll drain the Palmtop's batteries, causing the HP 100/200LX to shut down, losing any unsaved work.

Type III hard drives are available on the market, but do not work with HP Palmtops at this time because of power requirements and the fact that they are too fat to fit in the Palmtop's Type II slot. There are rumors that Type II rotating disk drives are in development.

ON DISK Index: page 52

Adding PCMCIA Drives to Your Desktop PC

Mark explains the basic considerations for choosing and installing PCMCIA drives on your desktop PC.

By Mark Scardina

Over the last two years, we have seen a proliferation of PCMCIA slots in palmtops, laptops and notebook PCs. Where we once had only small PCMCIA data storage cards of a few megabytes, we now have PCMCIA modems, network cards, 100MB hard drives, sound cards, SCSI cards, and more. By adding a PCMCIA drive to your desktop PC you can use some or all of these cards on your desktop. We hope this article will help you navigate around the world of PCMCIA card drives and choose the right one for your PC.

There are two major classes of PCMCIA drives that can be added to your PC. One class supports specific PCMCIA cards and I shall refer to them as *dedicated drives*. The other class is designed to support all PCMCIA cards, and they will be referred to as *full-support drives*. This distinction is very important as it impacts not only on the cost of the drive but on its resource requirements on your desktop PC.

Dedicated Drives

Dedicated drives come in two flavors - parallel port drives and internal bus drives. Since the PCMCIA standard is evolving, drives designed several years ago are unable to support many of the new types of cards that are available today. While the standard is 'backward compatible', this only guarantees that older cards will work in the newer drives and not vice versa.

The first major change in the standard was the introduction of

PCMCIA Release 2.0. This should not be confused with Type II which refers to the dimensions of the card. Prior to Release 2.0 all PCMCIA cards were data storage cards. This means that if a drive does not support the 2.0 standard, it will only work with data storage cards and not the modem cards, LAN cards, sound



External parallel port
PCMCIA card drive

Installing Internal Card Drives in Your Desktop PC

I recently had the opportunity of installing and testing an SCM "SwapBox" PCMCIA card reader in my desktop PC. I tested the Swapbox PREMIUM, which adds two internal card drives: one in the front and another in the rear.

Some assembly is involved in the installation. You have to take the desktop's case off, install a card in the rear, mount the front drive in an adapter, slide that into a drive bay, and connect the two with a ribbon cable. If you've installed a floppy or hard drive before, you'll be able to handle SwapBox's physical installation. If taking the cover off your desktop makes you nervous, get your computer dealer, MIS person or a knowledgeable friend to install the unit. For the SwapBox, your desktop PC must be an AT 386 or higher with 640K of RAM, running DOS 5.0 or later. You'll need an available 16-bit ISA I/O socket and an empty front drive bay (for front-mounted units). These requirements will vary depending on the card drive you install.

I installed the SwapBox into my Gateway 2000 486DX2/50. My Gateway has all sorts of accessories connected to it, including an HP Scanjet, a LaserMaster WinPrinter, a mouse, and a LAN network card. In addition, I have a number of other device drivers installed. This complicates memory management on my system. (My CONFIG.SYS file has more lines than the Federal Budget.) I had difficulty installing and properly configuring SwapBox's system software. A very helpful and patient SCM tech support person walked me through the installation, checking system interrupts (IRQs) and tracking down a missing MS-DOS file (my fault).

I also had to track down the correct mounting brackets (or rails) for my Gateway computer. Mounting brackets are strips of metal that attach to the sides of internally mounted drives and let them slip into the drive bay. One desktop manufacturer's drive bays can be different from another's, and SCM couldn't include all the different mounting brackets with each SwapBox. I ended up calling Gateway customer support. I received a pair of the correct mounting brackets two days later, at no charge!

My advice is that as soon as you decide to buy any internally mounted drive (hard, floppy, PCMCIA, whatever) from any source, ask them if they include mounting brackets for your particular computer. If they don't, contact the manufacturer of your desktop PC, tell them what you're adding, and have them send you the proper mounting rails.

It was a bit of an adventure getting the card drive installed, but most of it was unavoidable. I probably would have had an easier time with an external card drive, but it would have taken up more room on my already-crowded desktop. I have little patience with manuals and appreciate good technical support from a product's developer.

Publisher Hal Goldstein has a Protege installed inside his home Palmtop and a DataBook installed at work. He had no problem with the physical installation of either, everything fit properly. With the help of tech support, he moved his Protege device driver after his CD-ROM device driver in his CONFIG.SYS file to get the Protege to work properly. He likes both units. However, he prefers the Protege since it is only designed to access Memory Cards which is all he uses the drives for. The DataBook can use other PCMCIA I/O cards such as a fax/modem or LAN card at the cost of additional desktop system resources that he would prefer not to give up.

Rich Hall
Editor, The HP Palmtop Paper

cards, etc. that are supported in the 2.0 standard. Examples of these drives included the Databook Thin-card 200 series and the PAMCO /Steele Creek parallel drives.

Parallel Drives

As indicated by its name, parallel drives are external boxes that connect to your PC via its parallel port. Some of the more expensive drives provide

a 'pass through' port to allow your printer and the PCMCIA drive to work through the same parallel port. In evaluating which type parallel drive you need, remember that adding a second parallel port to your PC is usually less than \$20.

Parallel drives have the advantage of being easily installed and removed. They can be transferred from one PC to another and the software does

Requirements and Trouble shooting Full-Support PCMCIA Card Drives in Your Desktop PC

(For questions or problems with your PCMCIA drive, contact the manufacturer's technical support.)

Requirements

Before deciding on a full-support PCMCIA drive, you should be aware that it will require the following resources on your desktop PC:

System Memory: All of the required drivers when loaded into memory will require anywhere from 60-120K of System Memory. These drivers can generally be loaded high.

Upper Memory Window: A block of memory between C800 and E000 of 4K to 32K is required to access SRAM and ROM cards as well as to identify the type of card in the slot.

I/O Addresses: A block of 8-16 I/O addresses are required for communication with modems, ATA cards and LAN cards. This is similar to COM1 using I/O addresses starting at 3F8

Interrupts/IRQs: Two IRQs are required under most installations. One is used to signal a card being pulled or inserted while the other is used for such activities as communicating with a modem card in the same way as COM1 uses IRQ4.

Trouble shooting

Most installation programs do not properly detect your Memory Manager (such as QEMM, 386MAX, etc.) This means that it is usually necessary for you to manually edit its command line in your CONFIG.SYS to exclude the upper memory area reserved for the memory window. You do this by adding a parameter (e.g. X=D000-D7FF) to your memory manager command line. The preceding example excludes 32K of upper memory starting at address D000. You should consult your memory manager documentation for the correct syntax and the drive documentation will contain the size required as well as location options. Once you do this you will need to re-optimize your memory manager using a utility like QEMM's OPTIMIZE or Microsoft's MEMMAKER to reconfigure your system.

Another area is detecting unused IRQs. While some IRQs are associated with specific hardware, others may be used by software. There is nothing in your PC that prevents two devices from using the same IRQ, however, if they need it at the same time, your system will most likely crash. Fortunately PCMCIA Controllers can use the upper IRQs from 8-15 and it is usually possible to find two available there. This problem can also occur with I/O addresses, but fortunately since there are many more of these it is usually easy to find an unused one. If you have problems with the initial installation, this is usually a good place to look in order to resolve them. (Again, this installation can be non-trivial. If you have problems installing your PCMCIA drive, call the manufacturer's technical support number.)

Some Definitions

UPPER MEMORY WINDOW: The PC has an area of memory that resides from 640K to 1024K called Upper Memory. This is used by your display, BIOS, and Operating System to store code and data. A PCMCIA drive requires a portion of this area to act like a shipping area. Data sent and received from the card is put into this area. This area cannot be used by other programs and therefore your Memory Manager needs to be told to leave it alone by 'excluding' it. This window is located between address C000 and EFFF.

I/O ADDRESS: PCs have a range of input/output, I/O, Addresses that are used to communicate with most of the accessories that you can add. Items such as hard drives, modems, sound cards, network cards, SCSI cards, etc. need these addresses to send and receive data and commands. Since a PCMCIA drive accepts cards that perform these functions, it must be given a set of I/O addresses to use. These addresses usually are between 100 and 3FF and cannot be shared with other devices.

IRQs: Interrupt Request lines are like doorbells that are designed to get the CPU's attention when certain devices have data ready for it. Each PC has 16 IRQs that are numbered from 0 to 15 with 0 being given the highest priority. Your keyboard, serial ports, and mouse are examples of devices that need to own a unique IRQ to get the CPU to service it. A PCMCIA drive needs one IRQ to be able to tell the CPU when you have removed or inserted a card. A second IRQ is needed for modem and network cards to inform the CPU that data is ready to be picked up since it is originating from an external modem or PC. Generally IRQs from 10 to 15 can be used for PCMCIA drives.



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not put much demand on a PC's resources. Typically the software driver needed to run the drive takes less than 20K of system memory, and does not require its own interrupt, I/O addresses, or upper memory window (see definitions in the side bar on the next page). The price you pay for this ease of use is in the area of performance and compatibility. Data transfers through a parallel port are approximately one tenth the speed of those through an internal bus drive. Typically, these drives can transfer approximately 50K bytes per second. While this is five times faster than cable methods using programs like HP Connectivity Pack, LapLink and ZIP , it pales when compared to the 500-800K bytes per second capability of internal bus drives.

Currently, parallel drives can support data storage cards only. This includes SRAM, ROM, Series II Flash and ATA Flash cards. They require an external power supply which in most cases is simply an AC Adapter. Installation is straight forward and usually the only software required is a device driver that is added to your CONFIG.SYS file. *[IMPORTANT: Most drives come with a parallel cable. This cable and its length can be critical. The length of the cable affects the time it takes for the signal to reach the PC.*

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This is especially apparent connecting to PCs with fast processors (above 33MHz). Do not substitute, lengthen, or connect to a switch box without contacting the drive manufacturer.]

If you are primarily looking for a drive to transfer files and your card sizes are modest, the parallel drive is an excellent choice as it will not place the large demands upon your system that a full-support drive will. For dedicated parallel drives, check out the CardPort and Steele Creek drives.

Internal drives for memory cards only

Prior to the 2.0 standard, internal dedicated drives were the high performance choice for data storage cards. With the advent of ATA flash

cards and PCMCIA hard drives, we are seeing a new type of drive that works only with these cards. These ATA drives install as an additional IDE hard disk drive connecting directly to your IDE Hard Disk/Floppy Disk Controller card. A single IDE hard disk drive is standard on most PCs and is connected to an IDE controller card through one of the controllers two hard drive connectors. If you have a second physical IDE hard drive, you will need an additional IDE disk controller card to



Internal drive, I/O card and software

connect the PCMCIA drive.

A small software device driver, less than 10K, is required to handle removing and inserting the cards.

PCMCIA Drives Need Software Support

Every Full-Support PCMCIA drive has a PCMCIA controller chip that is the electronic heart of the drive. These chips are made by Intel, Cirrus Logic, Databook, Vadem, and VLSI to name a few. (The PCMCIA drive's documentation usually tells which chip is utilized in a particular drive.) My tests have shown the best results with drives that use the Vadem chip.

Unfortunately, having compatible hardware is useless if the required support software is not there as well. For example, the HP 100LX has PCMCIA 2.0 hardware but will not support LAN cards, Sound Cards, SCSI cards, etc. in part because there is not the software there to enable that support.

To access the variety of PCMCIA cards available now and in the future any full-support PCMCIA drives should come with a complete package of PCMCIA software. This includes all the device drivers required by the PCMCIA drive to recognize various types of PCMCIA cards. This is the drive manufacturer's responsibility and not the card supplier's. This software will state what level of PCMCIA standard it will support. Do not accept anything less than 2.0.

There has to be some standard way for the different controller chips to 'talk' with all the different PCMCIA cards and to your PC applications. This is accomplished by two-way communication between layers of software called "device drivers." The controller chip reads/writes to the PCMCIA card and communicates with the first layer of software. The first layer translates the controller chip's output into a standardized format. The second layer communicates between the first layer and the third layer, made up of many individual device drivers. Each device driver in the third layer handles a specific application or a PC operating system function. The standardized interfaces between these layers allows the PCMCIA drive to access a different type of card simply by adding the right driver to the third layer.

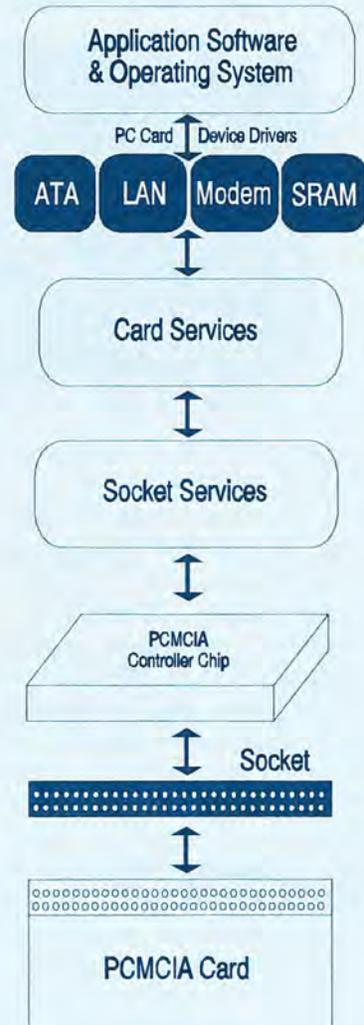
The first layer PCMCIA device driver is known as Socket Services. This level 'talks' directly to the hardware, the PCMCIA drive's controller chip. It is this device driver's job to present a standard interface to any higher level drivers thereby 'hiding' the hardware differences.

The second layer PCMCIA device driver is known as Card Services. This device driver is largely hardware independent and makes available all of the functions that a PCMCIA card is likely to require in order to be used, including properly identifying newly inserted cards. For example, a SRAM data storage card would need a 4-16K block of memory in which to transfer data while a modem card would need an I/O address and interrupt with which to communicate. A LAN card may need all three!

The third layer PCMCIA device drivers is a series of smaller drivers known as 'Card Services clients' that implement a card's specific functionality. For instance, an ATA client driver that is designed to enable FlashRAM or Hard Drives to be used would set up a drive letter (G: for example) and properly direct all file reads and writes for the PCMCIA card to drive G:. This client would use the routines in Card Services to get or send bytes of data to the card. There are usually separate drivers for SRAM cards, ATA Cards, Modems, and LAN Cards.

When you install a PCMCIA card drive in your PC these drivers must be installed in your CONFIG.SYS file. The following is an example of what the CONFIG.SYS file's PCMCIA device driver command lines for the CardSoft drivers from SystemSoft.

```
device=c:\cardsoft\obss.exe . . . . . Socket Services
device=c:\cardsoft\cs.exe . . . . . Card Services
device=c:\cardsoft\csalloc.exe . . . . . Checks for resources
device=c:\cardsoft\atadrv.exe /s:2 . . . . . ATA Drive client
device=c:\cardsoft\mtsrsm.exe . . . . . SRAM/ROM client
device=c:\cardsoft\mtddrv.exe . . . . . SRAM/ROM client
device=c:\cardsoft\cardid.exe . . . . . Modem, I/O client
```



The small size is possible because the PC's basic input/output system knows how to talk to IDE drives which ATA cards emulate. Like the parallel drives above, the resource requirements of this type of drive are very low, however, the speed of access is on a par with the fastest hard disk drives. The dedicated PCMCIA drives are an excellent choice for those who have only the ATA type data storage cards as they are less than \$100 and do their job well. Protege and Adtron have dedicated internal bus drives that are worth evaluating.

Full-Support Internal Drives for Storage and I/O Cards

Full-support drives are intended to support all PCMCIA cards. The drives can access a variety of cards, such as memory, fax/modem, and LAN PCMCIA cards. To accomplish this, more PCMCIA support software must be installed on your PC. These drives require more of your PC's system resources than the dedicated drives.

Adding full PCMCIA support can be a rather complex affair (see page 16 sidebar on requirements and trouble shooting). Fortunately, the software vendors are beginning to make the software able to detect potential conflicts and easier to install. While there are beginning to be more reliable drives coming to market, a good place to start for a Full-Support drive is one that uses the Vadem Controller and Phoenix's PCM+ software.

Hardware Considerations

We've looked closely at the software, but there are several hardware considerations to keep in mind when you are selecting a drive. Most current drives have an opening that will support at least Type III, 10mm high PCMCIA cards. This height is necessary for ATA hard drives. While there are some PCMCIA card drives designed for Toshiba laptops that are taller than 10mm, the extra height has not been approved by the PCMCIA Standards Committee and is not likely to be. Make sure the drive has a 'busy' indicator. This is very impor-

tant for your large data storage cards as it will let you know when the drive is inactive and you can pull out the card. A hinged door, while not a requirement, provides a cleaner appearance and helps keep foreign objects out.

Two and Four slot drives are now available. I would recommend the two slot drive as the most reliable and best value as a second controller is not required. Some models allow installation of the second drive in the back of the PC. Then you have to fight with all the serial and parallel cables at the rear panel to insert a PCMCIA card, so it doesn't make much sense to me. However, if you have no free drive bays, you have no other choice if you want to add an internal drive. The four-slot models with the a rear insertion drive have tremendous resource requirements, and I have not found this setup to be reliable.

A few final purchasing tips. Don't purchase any drive that cannot be returned. If you are buying from a dealer, bring the cards you use and have him demonstrate that they will work. A good test is to insert and immediately access the card. There should be a small delay but otherwise the drive should work without a problem.

The Future

The future brings a feature called "Plug-n-Play" to your PC, which is designed to allow you to add drives easily by including the PCMCIA software in the operating system. PCMCIA support is already included in IBM's OS/2 operating system and is planned for Microsoft's 'Chicago' Windows 4.0 release next year. "Plug and Play," also refers to PCMCIA cards that provide their own resources, that can be inserted and used without installing special drivers. PCMCIA support is growing. There is no question that adding it to your desktop PC greatly enhances your ability and efficiency when working with portable and palmtop PCs.

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Use File Compression and Maximize File Storage on your PCMCIA Card

By Mark Scardina and Hal Goldstein



What is Data Compression?

Storage space on the HP Palmtops, like precious real estate, can be expensive and limited. The use of data (file) compression programs can mean significant disk space savings on the Palmtop's PCMCIA A drive and internal C drive.

Data compression software lets you store the same information (data files and program files) in less space. For example, many data and program files have a lot of empty space and redundant information in them. If we could reduce the size of the data and program files we use on our HP Palmtops, we would have that much more space left over for other files.

There are two significant disadvantages to data compression. First, loading and saving files can be slower because a file must be decompressed before it can be used by an application. Secondly, the compression/decompression program occupies some disk space. In addition, it usually requires extra disk space for temporary or permanent file storage. Some programs require extra system RAM to perform compression.

This article focuses on two compression programs: Stacker, a commercial program, and DIET , a freeware program. In many cases, the benefits associated with using file compression on HP Palmtops outweigh any inconvenience associated with slower read/write times.

The Basics of Stacker

Stacker is perhaps the most popular commercial file compression utility available (see PCMCIA Products, page 47). Stacker can more than double the capacity of your memory card and once it's set up, Stacker is trans-

parent to the user — just save your files to the drive and Stacker does the rest.

Any disk is divided up into discreet units called sectors. One or more sectors make up larger storage units called clusters. Stacker works by ignoring the DOS cluster structure on the disk, allowing it to use every

sector in a cluster.

With version 3.0, Stacker introduced the ability to vary the actual amount of compression. The greater the compression, the slower the access speed, and vice versa.

Stacker 4.0 introduced 'sector packing' capability. Even though 3.0 could pack clusters, the minimum

Installing Stacker 4.0 on your HP Palmtop

If you already use Stacker 3.0 and want to upgrade, Stacker has made things a bit more complicated with version 4.0. Before providing you with step by step instructions, you should be aware that the Stacker 4.0 license is granted for one PC per copy and that your 100/200LX requires its own copy. Do not purchase the Stacker Upgrade package for your 100/200LX. This package is designed for DOS 6.x users and does not provide the necessary programs for use on your 100/200LX.

While there are various methods to create a Stacker drive on your card, the following method is the easiest and most reliable. This method creates a 'bootable' card and allows you to reboot your HP 100/200LX without Stacker by simply removing your card:

1. Start with a freshly formatted memory card.
2. Using MEMO or a DOS text editor create A:\CONFIG.SYS with the following lines:

```
device=a:\stacker.com
files=30
buffers=6
shell=d:\dos\command.com /p d:\dos
```

(If you are using MEMO make sure you save this in ASCII format.)

3. Using the same editor create A:\STACKER.INI with the following lines:

```
/P=10
/AUTO
A:\STACVOL.DSK,RP
```

(Once again make sure you save it in ASCII format. This file is new to Stacker 4.0 and is used in lieu of the command line parameters. /P=10 sets Stacker to MAXSPACE. /AUTO allows your card to auto-mount when inserted and RP stands for Replaceable Drive, which is what your card is.)

4. Copy STACKER.COM to your A: drive. Also copy any other device driver programs that appear on the lines BEFORE the Stacker device line in the CONFIG.SYS file. The files stored on this unstacked portion of the RAM card will not be accessible once Stacker loads unless you unmount the card or boot without Stacker.

TIP: If you have DIET 1.4x, you can compress STACKER.COM with the following command line:

```
C:> DIET -X STACKER.COM
```

5. Copy the following Stacker files from your Stacker disk to your C: drive:

```
CREATE.COM
SCREXEC.EXE
SCREXEC2.EXE
```

6. Enter the following command from the DOS prompt with System Manager terminated:

```
C:> CREATE A: /S=0 /R=2.5
```

This will create a hidden STACVOL.DSK file on your memory card.

7. Reboot your 100/200LX and you should have a new A: drive. At this point you can create an AUTO-EXEC.BAT on A: and erase the Stacker files on C:

One final note. Under Stacker 4.0 there is no longer the inconsistency between the space remaining as reported by CHKDSK and that reported by DIR. This is because Stacker actually changes the reported number of sectors on the disk based on its current average compression ratio. This is actually just 'smoke and mirrors' and you should continue to regard the remaining space figure as an estimate.

unit a file was stored in was still a sector (512 bytes). That meant that very small files still took up 512 bytes and if a file was a little larger than 512 bytes, the remainder took up another sector. This approach still wastes a considerable amount of file storage space.

Version 4.0 achieves its increase of more than 2 to 1 compression by packing individual sectors. It is most effective on larger Flash RAM cards with larger clusters containing many sectors. Small 2MB-and-below cards with relatively few sectors do not take advantage of Stacker 4.0's technology. Any gain you get on smaller cards will probably be offset by the loss of 12-17K of system memory.

Should I use Stacker?

Before deciding whether to use Stacker, or whether to upgrade from version 3.0 to 4.0, read through the following questions:

1. Do I use all of the capacity on my memory card?
2. Do I frequently have to close applications to open others?
3. Is the physical size of my card 5MB or more?

If you answered Yes to questions 1 and 3 then you should seriously consider Stacker 3.0 (or 4.0 if you are already using 3.0). If you answered Yes to 2 as well, then the decision to use or upgrade is less clear and you may need to do some experimenting.

If you answered Yes to question 2 and No to 1 or 3 then you may not need to install Stacker (or upgrade to version 4.0) at this time. In fact, as long as you answered No to 1, I see no reason to consider Stacker at this time.

DIETing your HP Palmtops Files

DIET  can be used to manually compress individual .COM and .EXE program files. In addition, it can be installed as a memory-resident utility that automatically compresses and decompresses files to your internal C

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drive or PCMCIA card. Once installed, DIET will automatically recompress previously compressed files, including data files for the built-in programs MEMO, PHONE, etc. Files automatically get recompressed only if DIET initially compressed them. In other words if you create a new 1-2-3 file named BUDGET.WK1, you must first enter DOS and then type **diet budget.wk1** to compress it. Whenever you load the file it is automatically decompressed. Whenever you save it, it is DIETed again.

Built-in program data files will recompress in a similar manner if they have been previously DIETed. However, they are recompressed only after you have exited to the DOS prompt and run a DOS program (like CHKDSK). Once the DOS program has been run, DIET automatically recompresses any built-in program data files that have been modified and saved.

Many people have used DIET on their Palmtop without problems. However, backing up your files to a PC on a regular basis is always a good idea. It's especially a good idea while you gain experience and confidence in using DIET.

[A more complete description of DIET and installation instructions can be found on page 10 of The Best Palmtop Tips, and page 20 of Jan/Feb 92 and page 17 of the Fall 91 issues. Also helpful is the documentation to DIET found in the 1992 Subscribers Disk and various DIET-related files found in the HP HAND forum of CompuServe.]

Other File Compression Programs

MS-DOS DoubleSpace

Using MS-DOS DoubleSpace on the 100/200LX is not possible as DoubleSpace requires DOS 6.x except for the special version in the Omnibook Series. That version does not support removable drives and can only be run on the Omnibook.

ACE DoubleCard and DoubleFlash cards

A variation of the SRAM and Flash memory cards are the DoubleCard,

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DoubleFlash, and DoubleFlash+ (cards) marketed by ACE Technologies (see ad, back cover this issue, see product description, page 38). These cards have onboard versions of Stack-er (3.0) and an ACE utility that enhances file compression performance.

Doublecards are SRAM cards requiring a battery for data retention. Doublecards come with compression software built in and work with any HP Palmtop. **DoubleFlash** cards are SunDisk ATA flash cards with compression software built in. They work with any HP Palmtop. **DoubleFlash+** cards are IBM ATA FlashRAM cards with built-in file compression software. The DoubleFlash+ is the newest flash card technology with read/write performance close to that of SRAM cards. They work with the HP 100/200LX but not the 95LX.

PKZIP

PKZIP is a popular shareware file compression program. We use it to compress and archive the files on the HP Palmtop Paper ON DISK. PKZIP has many options, but it is possible to make use of this program using a few of its basic options, and learn

more about advance features as you need them. PKZIP can compress an individual file so it takes up less space, or archive a number of files into a single compressed file.

PKLite

The shareware program PKLITE, like DIET, compresses executable files (with .EXE and .COM extensions), and adds a small amount of extraction code at the beginning of the compressed executable file. When you want to run the program that has been compressed, all you do is type its name at the DOS prompt. It automatically uncompresses and runs. The compressing process does not change the operation of the program at all, it merely reduces the disk space required to store it.

PKLITE will run on any IBM PC/compatible with DOS 2.0 or higher.

LHA is a freeware file compression and archival program. We used it to compress and create self extracting files on the 1993 and 1994 Subscriber's PowerDisk.

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15 PCMCIA Recommendations

Consider these points before purchasing a PCMCIA memory or I/O card and you'll be more satisfied with the outcome.

By Hal Goldstein

PCMCIA Memory cards

1. Get as large a card as you can comfortably afford.

As time goes by you'll discover more programs or data that you would like readily available on your palmtop.

2. At least purchase a small SRAM card to back up your important files.

There is always a chance you will mistakenly delete a key file (eg your PHONE or APPT book), batteries will run out, or files on the C drive get corrupted. If you have no regular means of backing up your C drive, at the very least you should purchase a small SRAM card for this purpose. A 128K, 512K, or 1 Meg SRAM card retails for between \$35 to \$175. Just be sure to change your SRAM card's battery every year. (New Media sells small flash cards called Flashback with backup software for under \$100. See page 39.)

3. In most cases you are better off buying a flash card than a SRAM card.

Unless you are on a tight budget or only need a small amount of disk space for backup purposes, flash cards are a better investment. The cost per megabyte of a flash card is considerably cheaper than a SRAM card, especially for larger capacity flash cards. In addition to cost, the major disadvantage of an SRAM card is that it requires a battery to maintain its data where files saved to a flash card are permanent until delet-

ed by the user.

On the plus side, SRAM cards are cheaper if you only need 128K, 512K, or 1MB of storage space.

4. Avoid using disk compression software on your SRAM or Flash card unless really necessary.

If you need to maximize storage space on your memory card; Stacker, Diet, or ACE DoubleFlash software offer safe solutions. With compression software you can store approximately 1.5 to 2.5 times the data that you can normally store on a PC Card. However, there are four to five significant reasons why you might not want to use disk compression software.

First of all, disk compression software appropriates valuable System RAM memory. This means that if you are using disk compression software; you are more likely to receive an "out of memory" message when trying to open an additional System Manager application. For example, if you have 1-2-3, PHONE, and APPT open, you may not have enough room to open MEMO because of the System RAM that the disk compression software borrows.

A second reason to hesitate using disk compression software is that it may slow the Palmtop down a bit. This is especially true for those storing large phone books or data base files on a compressed PC Card. Normal operations, such as searching, saving and using subsets can bog down significantly on a compressed card.

Thirdly, by using disk compression software on a PC Card, you may

limit the number of devices that can access that particular card. For example, I have a PC Card drive in both my desktop computer at work and at home, and I have an HP OmniBook with PCMCIA card drives. I frequently swap files between all these machines using a memory card. In addition, I often use a memory card to give fellow *HP Palmtop Paper* editors a copy of a file for testing on their Palmtops, or for editing on their desktop PC. If I used compression software on my Palmtop's PC Card, all of the above mentioned systems

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would also have to use that software to read my card. Putting compression software on other Palmtops, my OmniBook or desktops when not needed would mean added expense and needless resource penalties for those systems.

Fourthly, compression software is not seamless. Some technical expertise may be needed either initially, for reinstallation, or for troubleshooting potential conflicts with other programs.

Finally, although disk compression software has pretty much passed the test of time, the issue of data safety cannot be totally ignored. Disk

compression adds an extra layer of complexity, and that increases the possibility (however small) of files or disks getting inadvertently corrupted.

Despite all these objections, many users find disk compression software both economical and practical. You must weigh the pros and cons to come up with what makes sense to you.

5. Find out the actual non-compressed capacity of the PC Card you purchase.

ACE, Sundisk, and an increasing number of PC Card vendors adver-

tise their cards in terms of their approximate total compressed capacity rather than the card's physical disk space. If you're shopping around for the best price, you need to know whether the price you're being quoted is for a 20MB card with file compression, or a 10MB without compression.

6. Get a PC Card drive for your desktop.

I haven't used a Palmtop Connectivity Cable in months. I transfer and backup Palmtop files by inserting my Palmtop's PC Card into my desktop

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PCMCIA Card drive. I log onto my desktop's "D:" drive and copy, save, or delete files using regular DOS commands.

If you have an empty drive bay and I/O slot in your PC, and are willing to spend 30-60 minutes installing a drive, I recommend purchasing an *internal* PCMCIA card drive as opposed to an external drive that attaches to your parallel (or serial) port. The advantage of the external PC card drives is that they are easier to install and their software drivers take less system RAM. However, internally mounted drives are faster than external ones and I found I was quickly spoiled by the hard-disk-like speed.

Internal PC Card drives tend to be less expensive than their external cousins. They are now available for under \$100 if you only need them to read and write to Memory cards. If you want your PC to be able to access fax/modem and other input/output devices, you'll need to

spend a little more for a card drive. Also, be sure to check out Mark Scardina's article on page 15 to get a balanced view of the pros and cons of these devices.

7. ROM-based software is easier to use and access, but is inflexible and more expensive.

ROM cards are PCMCIA memory cards that can be read from, but not written to. Some manufacturers make their software available on ROM card. HP offers a Dictionary/The-saurus ROM card (HP F1005A, see page 50) and Pocket Consultant offers a series of ROM-card-based software programs (see Pocket Consultant references, PCMCIA Products, pages 49-50).

Usually all you have to do with ROM card software is plug it in and perhaps perform a simple instruction to be up and running. However, due to the cost of the ROM card itself, prices tend to be higher than soft-



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ware on floppy disk. Another disadvantage of ROM card-based software is that you can't use your PCMCIA slot for anything else while using the card.



If you want to access more than one DOS program or have large data storage needs, you may be better off copying the ROM card software and other desired programs on to another larger capacity memory card, or the C drive to avoid switching PC cards back and forth. In some, but not all cases, ROM-based software can be copied. (This is not the case with the Hewlett-Packard Dictionary/Thesaurus card – the ROM card must be present in the card slot for the software to run.)

8. HP 95LX users should verify that the memory card works in their Palmtop.

Any PCMCIA SRAM card should work in any HP Palmtop. Some SunDisk flash cards will work on the HP 95LX, and some won't. (SunDisk is the original manufacturer of most of the ATA flash cards available as of

this writing, August 1994). IBM flash cards and future flash cards probably won't work with the HP 95LX. In any case check with the vendor before purchase.

9. There are two "classes" of flash cards - make sure the vendor guarantees the card will work with your Palmtop.

The HP 100/200LX automatically recognizes SunDisk and IBM ATA flash disks. The HP 95LX can use some Sundisk ATA cards with special driver software. Do not purchase non-ATA flash cards (usually less expensive), unless the manufacturer or vendor verifies the card works with the HP Palmtops with custom driver software. Find out how much system RAM the custom driver takes and whether you will be able to read the card in other systems before purchase.

Input/Output cards
(Fax/Modem and other cards)

10. Don't purchase any I/O card unless the manufacturer guarantees it works with HP Palmtop.

Make sure the manufacturer has tested the card. As of this writing, due to power and software issues, we know of no LAN, SCSI, or Sound PCMCIA card that works with an HP Palmtop. In addition, not all fax/modem cards work with HP 100/200LX. The New Media PalmModem (see page 43) is the only fax/modem card available that works with the HP 95LX.

11. Not all fax/modem card software works with the HP 100/200LX.

Some fax/modem cards come with Windows-based fax and communications software, and this is useless on



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the HP Palmtops. In addition, you must be aware of how much disk space the fax or communications software occupies. (The built-in COMM and cc:MAIL software may suit your communications needs, although both programs are limited). Most fax software is relatively large, and remember that if you are using a fax/modem card, you're limited to the internal memory of the Palmtop for file storage. You may want to purchase compact fax software such as SSFAX-ER separately (see page 47).

12. We recommend fax/modem cards designed with HP Palmtops in mind or at the least cards in which a third party provides a custom HP Palmtop solution.

PC Fax/modem Cards or solutions designed with the HP Palmtop in mind means better support, less hassle, and minimum startup time. New Media, EXP and the Smart Modular Fax Modem & Memory cards come with fax (and in the case of New Media communications) software built-in, saving precious C drive space. The New Media PalmModem (page 43) was designed for the HP 95LX and has been ported to the HP 100LX. You must use the PalmModem's built-in software. The EXP ThinFax modem (page 44) and the Smart Modular Fax Modem plus flash memory (page 44) were designed for the 100LX/200LX. Our testing and user feedback is quite positive about the New Media PalmModem and EXP ThinFax. We are quite excited about the Smart Modular 2MB and 4MB flash/fax/modem. We have not received any general user feedback as of this writing, but have published a review by an outside source on page 29 of this issue. The ACE Megahertz card (page 43) comes with ACE-FAX software (page 43), small enough to comfortably fit on the C drive.

On the other hand, if you intend to use your fax/modem cards in other machines, you may be better off with a "general" Type II fax/modem card that is known to work in the Palmtop.

13. When purchasing a fax/modem card, consider all the variables.



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When you are ready to purchase a PCMCIA Fax/Modem Card, consider hardware compatibility, software compatibility, software disk space required, modem speed, fax speed, ease-of-use, ease-of-learning, and price. Also, consider the physical design of the unit. For example, the Megahertz Xjack cards connect directly to an RJ-11 cable where most other fax/modem cards require an adapter or adapting cable between them and the RJ-11 phone jack. Finally, consider the quality of tech support offered and whether your vendor will take your unit back without hassle if you are displeased with it.

14. Consider using an external portable fax/modem instead of a card.

There are a number of external portable fax/modems available and can be connected to your Palmtop's serial port. You can then store fax or communications software on a PC Memory Card and have room on the card

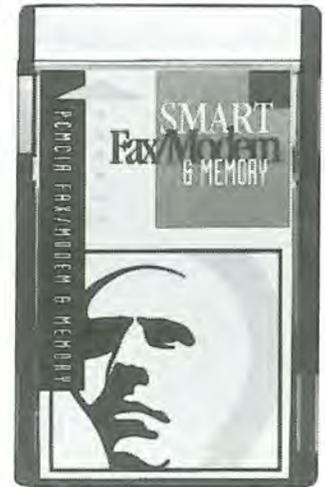
for uploading or downloading files and E-MAIL. External fax/modems can be less expensive than card modems, but are bulkier and require that you carry around extra cables, adapters and a charger. (Shier Systems, phone: 805-498-6786, fax: 805-498-8174, provides custom modem cables for HP Palmtops.)

General Advice

15. I recommend purchasing your PC Card from one of our advertisers.

I say this not to be self-serving, but as practical advice. Any company who advertises (especially over time) in *The HP Palmtop Paper* has shown its commitment to the HP Palmtop market. These companies are at the least HP Palmtop-aware and are most likely to provide the proper documentation, support, and testing for their PCMCIA Card product on the HP Palmtops.

Combo PCMCIA Cards Are Made for the HP Palmtop



If you use both a fax/modem card and flash memory card on your HP Palmtop, you've probably already wished you could combine both on a single card. Multifunction "combo" cards aren't new, but were not available for the HP Palmtops. The introduction of Smart Modular's Fax Modem & Memory Card for the HP 100LX/200LX has changed this.

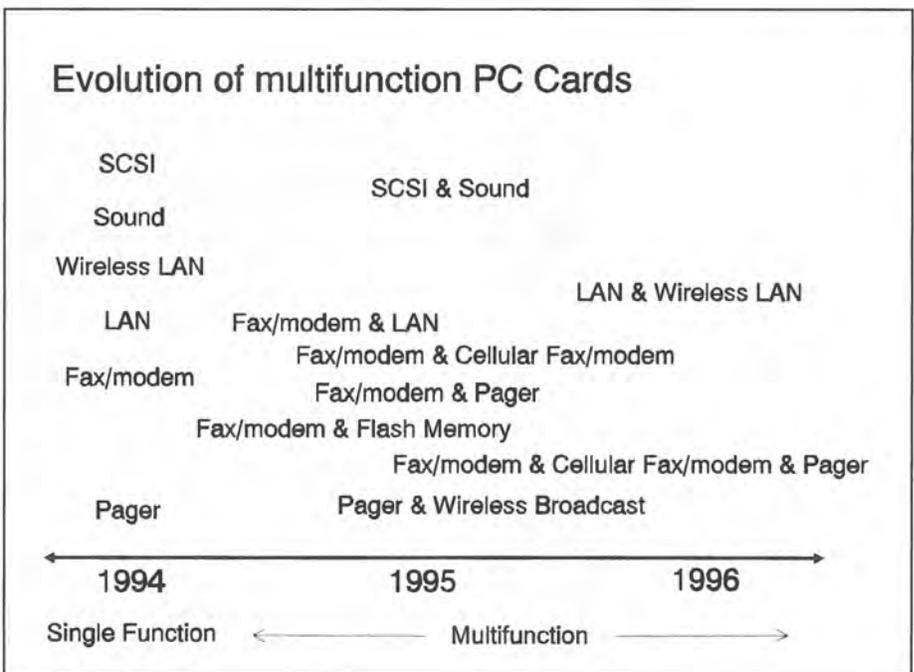
By Portia Isaacson

A combo card is a PCMCIA PC Card that performs two or more functions that are usually performed in two different PC Cards or in a PC Card plus an external device. Combo cards are also called multifunction cards. Given

the rate at which manufacturers are packing functions into PCMCIA cards, we will need to call them multi-multi-multi function PC Cards.

Combo cards potential boon for HP Palmtops

Combo PC Cards are particularly well-suited for the HP Palmtop since it has only one PCMCIA slot. However, HP Palmtop users may not be able to use many combo cards because of their power requirements. Combo cards eliminate the hassle of having to change cards in order to take advantage of multiple functions. Ideally, a combo card offers synergistic functions rather than just combining two unrelated functions on the same card. The Smart Modular Fax Modem & Memory card mentioned in the sidebar on the next page is a good example of this synergy. This



ABOUT THE AUTHOR

Portia Isaacson is President of Dream IT, Inc. a 5-person company that specializes in the mobile computing market. Dream IT's primary publication is *Cards & Slots: PCMCIA Market Letter* (\$495/year). *Cards & Slots* is organized so that subscribers can file articles by topic (e.g. Company Profiles, Distribution Channels, Advertising & Promotion, News, Cards, Applications). Dream IT consults on the mobile computing market and technology trends including market forecasting, competitive analysis and distribution channel analysis. Portia Isaacson writes the *Emerging Technology Reviews* column for *Computer Reseller News* and the *Dream This* column for *OEM Magazine*. (Dream IT phone: 719-598-9000)

card combines 4MB of flash memory with a fax/modem, allowing HP Palmtop users to store faxes, files and programs, and access a fax/modem without having to swap cards.

One of today's most popular combo PC Card among notebook computer users is Xircom's CreditCard Ethernet+Modem, which is designed for the large percentage of notebook computer users who want to be connected to a LAN when in the office and by modem when they are away from the office. HP Palmtop users should note that the power requirements of the Xircom CreditCard Ethernet+Modem are too great for use on the HP Palmtop. (Xircom 10BaseT= \$799; Phone: 800-438-4526.)

Take any two or three of today's PC Card functions and probably some manufacturer is considering combining them.

The future of combo cards

Paging looks like the next fertile arena for the combo bug. Vendors are announcing the addition of pager capability to modems, pagers that operate with or without being in a computer, and pagers with wireless broadcast reception capability. The idea behind NovaPak's fax/modem plus pager is to carry the card in or out of the computer and, when a pager signal is received, insert the card in the computer to process the message. (NovaPak fax/modem plus pager = \$449; available 9/30/94; Phone 510-249-9777.) Socket's PageCard operates as an alphanumeric pager tucked away in your pocket or purse with its own small LCD display. (Socket PageCard; Pricing not yet available; Phone: 510-670-0300). But in a PCMCIA slot it becomes a wireless broadcast receiver for applications such as Microsoft Mail, Schedule Plus and Paradox; updating e-mail, calendars or price lists. The paging generation of combo cards have only recently been announced. To our knowledge none are shipping and we do not know whether or not they will operate within the HP Palmtop's limited architecture.

Within a couple of years you can expect to see combo cards consisting of a fax/modem plus cellular fax/modem plus pager. Although you might wonder why a user with a

cellular telephone would also want a pager, users are quick to explain that receiving a page requires less interruption than a phone call. Another obvious combo card for notebook computer users is a wired LAN plus wireless LAN. The user would prefer the wired LAN connection when possible because it is faster. However, when using a notebook computer in a conference room, in an office down the hall, on the deck, in the cafeteria, or (as in my case) sitting on a sofa watching Star Trek re-runs while writing this article, the wireless LAN is perfect.

1995 may be the year of the combo card now that PC Card manufacturers see how stingy computer manufacturers are going to be with their PCMCIA slots.

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A Closer Look at Smart Modular's Fax/Modem & Memory Card

By Portia Isaacson and Paul Miller, Dream IT

We spent several days testing a near-production version of Smart Modular's Fax/Modem & Memory Card. The card transmits faxes at 14.4 Kbps and receives faxes at 9600 bps. Data transmission is at 2400 bps. In addition to its competitive modem functionality, Smart Modular's Fax/Modem & Memory Card, features 4Mb of flash memory that is accessed by DOS as the F drive (2MB version also available). The memory portion of the card is flashRAM (not ATA) and comes with flash file system built in. The flash file system software uses 3.2K of conventional memory.

The Smart Modular card operates with the HP 100LX's built-in Datacom application for data transmission and comes with Bitfax for sending and receiving faxes.

Smart Modular has synergistically combined a modem and flash memory into a single combo card. Unlike most PCMCIA-standard combo cards on notebook computers using PCMCIA Card Services, the HP 100/200LX can use the memory and the modem of the Fax/Modem & Memory Card simultaneously. Data on the flash memory (the F drive on the HP 100/200LX) can be sent using the modem without transferring it to drive C and data can be placed on drive F as it is being received. As of the time this article was written, to accomplish this it was necessary to use an F drive resident datacom package (e.g. Procomm) rather than the HP 100/200LX's resident Datacom. However, we expect Smart to correct this prior to shipping the product.

As of this review, this combo card operates only with the HP 100/200LX, not with notebook or desktop computers with PCMCIA slots. Soon, the combo card will be able to operate with notebook computers using PCMCIA-standard Card Services. Then a user will be able to load programs (e.g. a data communications program) on the Fax/Modem & Memory Card when it is installed in a notebook computer or desktop computer equipped with a PCMCIA reader/writer. Smart Modular is planning to update the card's software so that it will operate with PCMCIA-equipped notebook computers so that it is capable of moving data or programs between a desktop or notebook computer and the HP 100/200LX. Existing users will be upgraded for multiple platforms.

The combination of a modem and flash memory adds significant functionality to the HP 100/200LX user. Larger files can be transmitted or received. More full-featured modem software (e.g. Procomm) can be used. Faxing becomes easier and more convenient with the faxes buffered in the memory of the modem card. In our opinion, the Smart Modular Fax/Modem & Memory Card is well worth the investment of \$349 for the HP 100/200LX user needing fax/modem capabilities and flash memory. (See PCMCIA Products, page 44, for more information on the Smart Modular card.)

HP StarLink: A One-Stop Solution to Wireless Messaging

HP's StarLink service integrates a Motorola PCMCIA wireless receiver, pre-installed HP StarLink software and messaging/news options to provide a one-stop solution to wireless messaging.

By Hal Goldstein and Mark Scardina

Hewlett-Packard's StarLink wireless service provides the hardware, software, and messaging services needed to turn your HP 100/200LX into a wireless message receiver. With one phone call (1-800-917-LINK), the user can sign up for the messaging options of his or her choice and have the necessary hardware and software in hand within two business days. (See StarLink product listing, page 46, for more information.)

StarLink represents a partnership of many companies. HP StarLink consists of an HP 100LX and the Motorola PCMCIA NewsCard with its protruding pod (see photo above). HP StarLink uses the services of National Dispatch Center out of San Diego, who in turn accesses paging services from PageNet.

Starlink Includes a PCMCIA Wireless Receiver and Messaging Service

The package includes a PCMCIA Type II-compatible Motorola NewsCard receiver with pre-installed HP StarLink software. The cards AAA alkaline battery provides approximately 21 days of battery life and the card warns you when the battery is low. The StarLink card slips into the Palmtop's PCMCIA slot, but can receive messages while it is out of the Palmtop and has 128K of onboard RAM memory for storage of incoming files.

Once connected to HP StarLink,

the subscriber can receive messages via the NewsCard receiver. Messages can be sent by anyone through one toll-free number.

Central message control in the U.S. is provided by the National Dispatch Center, Inc., (NDC), a wireless communications gateway and premier provider of message dispatch. NDC receives and processes StarLink messages 24 hours a day, 365 days a year, transmitting messages wirelessly to the HP 100/200LX. In addition to transmitting simple text messages, operators can be instructed to automatically update customers' appointment calendars and to-do lists. The subscriber provides a security code to enable colleagues to make these appointment book updates.

Currently, the wireless carriers for the Star Link service cover more than 90% of the U.S. population, with some international coverage early in 1995.

You can set StarLink to announce different types of messages in different ways, including short and long beeps, and excerpts from classical music. A total of 15 sounds are available with StarLink inserted in the 100/200LX and 10 sounds for the card alone. You can adjust the volume to three different preset levels when using StarLink with the 100/200LX.

When messages are received, they are displayed in an index screen as shown in the screen above.



HP 100LX with StarLink wireless messaging card



HP StarLink message index



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Highlight the desired message and press **ENTER** to see the text displayed. The text cannot be edited directly, but it can be highlighted, copied and pasted into any built-in applications.

In our tests, reception was mostly error-free, although we did get some transmission errors in some office buildings. Fortunately, StarLink checks incoming messages and flags messages with errors. Most of the time it's pretty easy to figure out the missing or misspelled text, but if you can't, you can call StarLink's toll-free 800 number to have the operator read the message back to you over the phone.

Other Starlink Options

Initially, StarLink will provide news, sports, weather, and other information services, as well as transmitting voice and data messages.

NewsLink will provide StarLink users with the latest headline news, Wall Street financial information, sports news, national weather reports and entertainment news.

StockLink is an optional service that provides up-to-the-minute stock quotes and news. There are four financial alert services to choose from, depending on your market interest. For example, a user can request real-time stock quotes or COMTEX buy/sell recommendations. (See StarLink product description, pages 46 for more on StarLink options.)

The StarLink Newscard lets you install its software on the C drive, or use it directly from the Newscard in the A drive. However, all incoming messages are stored on the C drive. (They can be marked and printed to a file on a card or a printer.) The installation to C drive requires 80K of disk space.

Other PCMCIA Wireless Receivers

Other wireless services and receivers are available for the HP Palmtop.

The SkyTel SkyCard allows the 100/200LX to receive messages of the SkyTel nationwide paging system.

The RAM Mobile Data service provides a wireless connection between a customer's LAN-based network and the RAM wireless data network, allowing communication to an HP 100/200LX with an Intel wireless modem.

MobileMedia Communications provides paging services nationwide and offers 100/200LX users with MobileMate, a wireless messaging card with integrated antenna that runs off of two button-type batteries. MobileMate inserts flush with the case (i.e. there is no bulb on the end like with the HP StarLink).

Please see page 46-47 for more information on these PCMCIA wireless cards and services.

Hot New PCMCIA Cards for your Palmtop

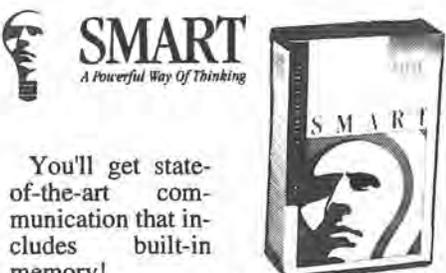
Big Memory



You'll be able to store really large programs and lots of data, just like a hard disk only better. This newest concept in Flash technology from Maxtor uses up to 9 times less current and writes up to 8 times faster than other Flash brands. Its type I size enables it to fit in any PCMCIA slot. Automatic data compression included typically doubles each flash card's capacity.

Stock #3242 (1MB/2MB compr)	.. \$99
Stock #3236 (2/4MB)	.. \$165
Stock #3237 (4/8MB)	.. \$269
Stock #3238 (8/10MB)	.. \$485
Stock #3239 (12/24MB)	.. \$619
Stock #3240 (16/32MB)	.. \$749
Stock #3241 (20/40MB)	.. \$899

Multi-Function



You'll get state-of-the-art communication that includes built-in memory!

SMART's new fax/modem and memory card allows you to fax larger files than before with its 4MB (optional 2MB) flash memory. Has 9600/4800 bps fax send/receive and 2400 bps modem.

Stock #3251 (2MB version)	.. \$289
Stock #3252 (4MB version)	.. \$379

Wireless Communications



StarLink wireless PCMCIA receiver card.

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PCMCIA Data Acquisition Cards

PCMCIA Input/Output cards are beginning to be used in the collection of data, making it possible to gather information on temperature, speed, pressure, accuracy, and more, from portable computers.

By Vincent Hebert

It wasn't long after the inception of PCMCIA technology in 1989 that PCMCIA cards began to trickle into the market. That trickle has turned into a veritable flood and the fastest growing market for mobile computers is the palmtop type such as HP's 95/100/200LX. Palmtop computers, with no disk drives and limited in-

ternal space for expansion, have increased the demand for PCMCIA cards. While cards for file storage have flourished since the release of the Type I standard, it wasn't until the release of Type II cards that Input/Output developers began to take notice of PCMCIA technology.

With Type II cards and PCMCIA version 2.0 specifications we have seen the release of many new I/O cards, including fax/modems, ATA flash disks, wireless communications cards, and more. More recently, PCMCIA data acquisition devices have been developed.

sition system is a thermostat on a modern household furnace. A thermocouple senses the room temperature and sends the information in digital form to a small computer chip in the thermostat. Based on settings you have programmed into the thermostat, it sends signals to the furnace, turning it on and off to increase or decrease the temperature.

Data acquisition on the HP Palmtops

The HP Palmtops were designed to collect and organize data. Someone tells you their name and phone number, you open PHONE and enter the information for future reference.

However, sophisticated data acquisition on the Palmtops has been limited so far. One device, the OWL Environmental Monitoring Interface was reported on page 9 of the March/April 1994 issue of *The HP Palmtop Paper*. This device connects to different types of analog and digital sensors and transmits data to a 95LX in spreadsheet-ready data files via an IR port link. The OWL is a relatively small device, but it is still larger than the HP Palmtop.

Data Acquisition

Data acquisition refers to the collection of information. If I read a thermometer and write down the temperature on a piece of paper I am involved in data acquisition. The data acquisition technology described in this article takes analog signals from a sensor measuring variables such as pressure and temperature, and turns these signals into digital information which can be stored and analyzed on a computer to solve a problem or control an existing system.

A simple example of a data acqui-

Palmtop Accessories for the HP95LX - 100 LX - Omnibook

Memory Cards

- 1MB SRAM \$140
- 2MB SRAM \$249
- 5MB Flash w/Stacker Card \$349
- 10MB Flash w/Stacker Card \$549
- 20MB Flash w/Stacker Card \$965
- 130MB Hardrive Type III Card . \$435

I/O Cards

- 2400/9600 Fax/Modem Card \$175
- Lan Combo T/2 Card \$199
- Fax/Mod Send/Rec for 100LX .. \$229

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ABOUT THE AUTHOR

Vincent Hebert has worked in the data acquisition field for six years in test, sales and technical marketing. He holds a degree in engineering and is finishing a BSEE at Roger Williams University in Bristol, Rhode Island. He is in Marketing Communications for ComputerBoards, Inc., and has written extensively about data acquisition involving PCMCIA technology.

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PCMCIA Technology and Data Acquisition

Type I cards with their 3.3mm thickness and vague specification were too thin for many of the surface mount components needed to implement data acquisition technology with a PCMCIA interface.

In September of 1991, with an inclusion of an I/O specification into the PCMCIA Standard Release 2.0 and the advent of 5.0mm Type II cards, data acquisition developers became more interested in PCMCIA technology. The following year, PCMCIA released Card Services 2.0 and Socket Services 2.0, the last specifications needed to develop input/output devices, including data acquisition devices, on PCMCIA cards.

PCMCIA adds portability to data acquisition

PCMCIA technology dramatically reduces the size of an application and makes it more portable. Flash cards are an example of this. The first 10MB hard disk drives took up as much room as today's desktop PC. Now you can get a 40MB PCMCIA Type II flash card roughly the size of

a credit card.

By using the HP Palmtops and other mobile computers, diverse (sometimes bizarre) applications can now be easily implemented. The use of the HP Palmtop in divergent applications has been highlighted in past issues of *The HP Palmtop Paper*. Physicians carry drug databases around in their pocket, earthquake victims bypass downed phone lines and use wireless communications to contact friends and associates. However, most of these applications involve the utilization of stored data and the output of data for communication, not the taking of input signals for analysis. This is changing.

Examples of Portable Data Acquisition

Reducing Lower Back Stress

The University of Vermont's College of Medicine, Department of Orthopedics is currently studying ways of reducing stress from vehicle vibrations on the lower back during long car rides. A mobile computer is used to take data from an accelerometer (or strain gauge) attached to a study subject. Other studies involve taking

data from pressure transducers attached to a person's feet. The data from these sensors and electromyography will be used to analyze lower back pain related to posture and lifting techniques for the insurance industry.

Quicker recovery from reconstructive knee surgery

During reconstructive knee surgery, surgeons push, pull and yank on the knee through necessity. The recovery time for patients involved in these operations is lengthy and costly; therapy and exercise are painful and expensive.

During this surgery (with the patient's permission of course) the same school brings in a mobile computer, data acquisition card and pressure transducers. Sensors are attached to the surrounding ligaments and tissue. Strain and pressure data is taken, brought back to the lab and downloaded into larger, powerful computers which analyze the data in an effort to minimize the stress caused on the knee by the surgeon, thus reducing recovery time.

The benefits are obvious to the general public. Think what this data is worth to a professional sports team whose star athlete needs such surgery, or to the athlete himself and his career.

Missile accuracy testing

Kaman Sciences of Colorado is doing missile accuracy testing. In order to test the accuracy of the interception of missiles, a fiber grid is placed in the nose-cone of the missile to be shot down.

These fiber grids are dense and critical to the measurement of the impact. There can be no imperfections in the grid when it is placed in the nose-cone. Before being placed in the missile, an optical scanner is run over the grid. The data from this scanner is fed into the mobile computer at 10Hz speeds of +/-100mV.

Walking from missile to missile, all the grids for the day's tests are certified with a mobile computer. After the missile is shot down, the grids will be gently removed and analyzed for impact and accuracy of the shot.

Improved factory operations

Probably the most common use of data acquisition cards is the monitoring of factory floor operations.

Georgia Pacific manufactures plywood and pressboard, among other wood products, for the construction field. During the course of these manufacturing processes temperature and pressure are brought to bear by many huge presses. As with any manufacturing process, checks must be done periodically to insure the integrity of the process.

Costly, high-strength resin is mixed with the wood for pressboard or placed between thin sheets of wood to make plywood. This resin must be kept at a certain temperature; the press must be able to exert a specified amount of pressure per square inch; the curing process kept at a certain temperature.

The most expensive part of the process is the flow of the resin. The other factors involved may affect the finished product, but shutting down the resin, then bringing it back up to temperature is only cost effective if that is truly the problem. In the past, the only way to troubleshoot the process was to shut everything down until the problem was identified and then all the components restarted. This was not only expensive, but usually involved a number of people trying to determine which part of the process needed correcting.

Now, with a data acquisition card in a portable computer, sensors are attached, data collected, software run and the culprit quickly identified and adjusted.

Clearly, a large manufacturing floor can realize the benefits of using these cards, but innovation doesn't stop there.

Field service: The key is portability

Service industries that maintain computers, copiers, and other equipment in the field all involve travel and troubleshooting.

For example, a call comes in to the field service office reporting a copier that doesn't work. A technician is dispatched to the site to speak with the operator of the copier who tells him "it just stopped working."

The service technician has to start guessing, or take the copier apart, trying different things until it works.

Time and work wasted.

What if the technician logs onto his Palmtop, logged in the time of the call and the reported failure, and then pulled out a data acquisition card and troubleshooting kit with wires and sensors. He attaches these to different points on the broken copier and runs a series of diagnostics tests.

The problem quickly identified, he repairs the machine. Next he pulls out the data acquisition card and inserts a memory card with a customer database. He logs the customer, the time the repairs were completed, the work he did and the parts used and is off to the next job. At the end of the day, he takes his memory card back to the central office and downloads all the day's work-related data into the company's main desktop with a PCMCIA interface. This information is stored in a database and used to generate invoices and reports, or recalled and reviewed at will. All the technicians at the facility carry a mobile computer from site to site. The savings on paperwork, filing, trouble-shooting and time are substantial. Also, maintenance sched-

ules and troublesome machines may be quickly identified and resolved.

The future of data acquisition cards

At the present time, delays in the development of data acquisition cards are caused by the limited availability of the necessary input/output chips and the fact that the board area on the PC card limits the amount of these chips that can be used.

As demand for these cards grows, the availability of the necessary chips will increase, solving part of the problem. In addition, the development of more powerful chips will allow more functions to be integrated on a single chip. This will help solve limits associated with card size.

Card and Socket Services software must be installed on your computer so it can talk to a PCMCIA card. Unfortunately, many companies are making not-so compatible versions of this software, making it difficult to expect cross-platform compatibility. Fortunately a software standard is developing quickly. As soon as Card Socket Services is more standard, more and more data acquisition applications will be ported to a PCMCIA card. (See PCMCIA Products, page 44 this issue.)



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First Looks and Future Directions for PCMCIA Products

Take a look at fax/modem cards that work with cellular phones, a new 3.5" floppy disk drive, Fax/Modem card recommendations, alternative Fax software, and possible future PCMCIA products.

Cellular Phone, Fax/Modem Combinations

By Stanley Dobrowski
CIS ID: [71031,2162]

One of the fastest growing Palmtop trends has been data communications using PCMCIA fax/modem cards. But no matter how convenient these cards are, the Palmtop user is still tied to a telephone cord. Wireless PCMCIA receivers and messaging services like HP's StarLink are available, but the user is limited to receiving messages. One solution to the wireless two-way data communications problem is the use of existing cellular technology in combination with fax modem cards.

I am in the process of evaluating several products which combine the HP Palmtop, a PCMCIA fax/modem card, and a cellular phone.

Nokia

One such combination is made by Nokia, a large supplier of cellular phones in Europe, and just starting to reach into the United States. I will be testing their PT128 cellular phone and their own brand PCMCIA slot modem. Nokia also makes another style phone which does not use the cradle, but allows a direct wire from the PCMCIA modem to a connector on the bottom of the phone. This combination would probably be more desirable for use with the palmtop, but an evaluation unit was not available for this test. The features and operation would be identical with either phone (see page 43).

Motorola

Motorola has announced a new line of cellular compatible modems called

CELLect. They come in two 14400 bps fax/modem versions: PCMCIA slot modem, which has a single connector which will accept a wire which goes directly to the cellular phone or a different wire for a standard phone; and a pocket-sized battery-powered model which uses a standard serial port. These modems connect directly to Motorola's MC2 MicroTAC cellular phones. (For more information call Motorola's Universal Data Systems subsidiary at 205-430-8000.)

Megahertz

Megahertz has fax/modems cards designed for use with cellular phones, but does not make their own cellular phones. The Megahertz cards support several popular brands of cellular phones including Diamondtel. Each brand and model of cellular phone usually requires a unique cable to connect the fax/modem card to the data jack on the phone (see page 43).

In a future issue of *The HP Palmtop Paper* I'll report on using the cellular/Palmtop combination, primarily for connection with CompuServe for E-mail and forum messages. I will also be connecting with the corporate minicomputer at work for remote login. Then I will try some of the shareware fax sending programs to see how well they do with these three brands of modems.

Travel Floppy with PCMCIA Interface

By Hal Goldstein

Accurite just came out with a 3.5" floppy drive that connects to the HP 100/200LX via a PCMCIA card.

Hopefully this is one of the first of many new PCMCIA input/output devices that actually work on the HP Palmtops.

We have tested the Accurite floppy drive with the HP 100/200LX and were pleased. (The drive won't work with the HP 95LX). A custom PCMCIA Card plugs into the HP 100/200LX and a cable connects it to a diminutive 3.5" floppy drive (which requires a power adapter or external batteries). With the drive you can access and exchange files between the Palmtop and a 3.5" diskette quickly. Since the Accurite solution takes up the Palmtop's PCMCIA slot, transferring files between a floppy disk and memory card is a little more difficult. You may have to swap files between your PCMCIA memory card and C drive before accessing the Accurite drive.

PC Fax/Modem card on the Palmtop: Failure then success

By Robert Amram

It was not always possible for me to have a fax machine available, so I decided to try one of the fax/modem cards advertised in *The HP Palmtop Paper*, with the idea of being able to receive two-to-three page faxes on my 100LX. It turned out that the card I first tried simply would not work. After much frustration and exchanges with the manufacturer, they apologized and gave me a full refund. As far as I'm concerned, they shall remain nameless.

I then decided to try the ThinFax Basic-LC card made by EXP Computers. I am truly delighted with the ThinFax. It is easy to install. It was

designed specifically for the 100LX and its communications and fax software are System Manager compliant. It also works in PCs equipped with a PCMCIA slot and a different fax/-comm program.

I found a minor snag printing a fax message from my Palmtop to a parallel printer (connected via a BSE serial/parallel adapter). I reported the problem to EXP tech support and got an instant response and directions for downloading an upgrade file, which reprogrammed the Thin-Fax to print properly (and render accented characters correctly). The only minor problems with the Thin-Fax that I've discovered is its inability to offer the European date format and the fact that texts faxed from the 100LX don't word wrap correctly on fax machines at the receiving end. However, I've found EXP tech support to be of such a consistently high quality, I'm confident these problems will soon be cleared up.

Simple Simon Faxer software works well with some fax/modem cards

By Rich Hall

A number of users have had problems with the communications and fax software found on some PCMCIA fax/modem cards. In some cases, the software is geared to the Windows operating system and useless on the Palmtop. In other cases, the program is physically too large and leaves little room on the Palmtops internal C drive for storing messages.

A number of users have posted messages on CompuServe, or written *The HP Palmtop Paper* about a compact fax program called Simple Simon Faxer (a.k.a. SSFAXER ). This inexpensive (\$19.95) program requires 95K disk space on the Palmtop's C drive and uses 312K of system RAM during operation. For more information, see page 47, this issue.

PCMCIA I/O Cards That Don't Exist Yet

By Harry Konstas CIS ID: [72540,620]

In the few years since PCMCIA Release 1.0 memory cards came out, we've seen increasing capacity, up to 20MB, and dropping prices. With PCMCIA Release 2.0, we now have Fax-modem, LAN, Ethernet, Pagers and even hard-disk drives on Type III cards.

The following non-existent PCMCIA products are not science-fiction! Today's technology is ready for such products. I hope to see some of these ideas on the market in the near future, maybe at next year's COMDEX! Here are some new product ideas for PCMCIA Type II, Release 2.0 & up cards that can be done with available technology, and my own PSRP (Possible Suggested Retail Price):

PCMCIAudio™ PUT YOUR FAVORITE MUSIC IN PCMCIA CARDS.

(PSRP - varies with the card's capacity)

Only a few weeks ago, a small recorder/player was introduced on the market, that uses a PCMCIA card (a 10MB Flashcard) instead of a microcassette for recording up to 120 minutes of monoral audio. This is now possible with new data compression hardware, and with 40MB flashcards which already exist, you could have a complete digital stereo album recorded on a PC card!

Imagine a flashcard, with a built in headphone amplifier, software for programmable music selection (like a CD player), an audio input (a small analog to digital converter) to record your favorite songs. You can enjoy the music you like wherever you go by inserting a card and plugging in the headphones (like Walkmans) into your HP Palmtop.

In a few years from now, we will probably see PCMCIA albums along with the CD's in the stores. These will be ROM-CARDS instead of FlashCards.

Technical info: The actual sampling rate for a monoral speech recording PCMCIA device is 5KHz, and with hardware data compression 4:1, it takes about 1.25KB per second. So 1250 bytes/sec x 3600 seconds (1 hour) equals 4.5MB of storage. With digital stereo, and a special compression algorithm with a 40KHz sampling rate, we need a PCMCIA RAM card of about 40MB for about 45-50 minutes of 8 bit digital stereo recorded material.

AM/FM Stereo PCMCIA II (PSRP - \$129.95)

Listen to your favorite radio station by just plugging your Radio-card into the PCMCIA slot of your 100LX. The on-card software will let you 'tune in' to stations using your keyboard, and the Palmtop LCD screen will show you the frequency, signal strength, stereo indication, volume levels, etc. and save 'preset' frequencies on the card's built in EEPROM memory.

Powered by the 100LX AA's, it gives you up to 15 hours of music. Plug in the headphones (used as an antenna at the same time, (like SONY'S Walkman) on the edge of your card, and enjoy!

VOICE RECOGNITION PCMCIA CARD. (PSRP \$495)

Would you like to use the built-in PIMS of your HP without touching the keyboard?

Well now you can with the VOICEFLASH™ voice recognition card.

The sensitive condenser microphone is located at the edge of the card and it can pick up audio from 3 feet away. The Speech-Learn™ software on the card is similar to the existing voice recognition programs. You only have to 'teach' the card to recognize your voice commands. Once the card has memorized your voice patterns into its 10MB flash memory, you no longer need to use the keyboard of your HP. You can even give your HP Palmtop a name and vocally activate it!

B&W Television Receiver PCMCIA II (PSRP - \$299.99)

Watch your favorite programs or news on this compact PCMCIA B&W T.V.! The TV screen will be your 100LX LCD. The resolution will be 528 x 200 pixels (4:3 standard TV ratio with a doubling of the horizontal resolution) leaving the right side of your LCD (112x200) for channel, volume control and other indicators.

The built in digitizing process of the card converts incoming signals to a 4-gray-scale image which gives an acceptable picture on the 100LX screen. Image refresh is 30 frames per second not interlaced, because of the 100LX screen hardware speed. The earphone plug on the edge of the card will provide the sound and the earphone's wire is also used as an antenna. This card is also powered by the 100LX's AA batteries. The T.V. should run a couple of hours since the LCD isn't backlit. (I have a CASIO 3-inch Color backlit LCD TV and it works for about 4 hours with 4 AA batteries.)

Digital Multi-Meter PCMCIA II (PSRP - \$189.00)

Great for electronics technicians or hobbyists. By plugging your PCMCIA multi-meter on the 100LX and running the built in software on the card, you will be able to record readouts of AC or DC voltages up to 500V, read OHMS from .001 to 20M ohms, and even test diodes.

Digital Oscilloscope PCMCIA II (PSRP - \$679.99)

A must for electronics technicians. This is a dual-trace digital 20 MHz digital oscilloscope on a PCMCIA card. The card's software will record your analog/digital waveform readouts on the LCD screen of your 100LX.

PCMCIA-Related Products of Interest to HP Palmtop Users

This section lists PCMCIA-related products and includes hardware, software, books, and services of interest to HP Palmtop users. The icons above the product name indicate which Palmtop the product is suitable for: **95LX** for the 95LX, **100/200LX** for the 100/200LX. If there is no icon, - check the product type introduction to see whether it applies to all or some Palmtops, or to desktop PCs. Suggested retail prices are listed.

We invite vendors and subscribers to send us information about HP Palmtop-related products they discover. We rely on information we receive from the manufacturer and cannot test every piece of hardware or software. We welcome any user feedback on product suitability.

By Richard Hall

Hardware

This section describes PCMCIA-related hardware products, and lists memory cards, card readers, I/O cards such as fax/modem cards, PCMCIA developers kits, and more.

Cases

95LX 100/200LX

Pocket Box Card Protector

Protective carrying container for Type I and II PCMCIA cards. Made of recyclable clear plastic.

Pricing (pack of three) \$3.00
CONTACT: PC Card Packaging, 386 South Street, Pittsfield, MA 01201, USA; Phone 413-442-1798; Fax: 413-443-3823.

PCMCIA Memory Cards

95LX 100/200LX

[A wide variety of PCMCIA memory cards are available. All cards listed below work with 95/100/200LX unless otherwise indicated.]

ACE Memory cards

ACE Technologies markets SRAM and Flash "Double" cards with compression software built in. The card capacities listed are approximations reflecting expected storage with compression software (e.g., a DoubleCard 2M is a 1MB SRAM card with file compression software installed). ACE offers the following cards.

DoubleCards - SRAM cards requiring a battery for data retention. DoubleCards come with compression software built in and work with any HP Palmtop. They range from the DoubleCard 1M (\$109) to the DoubleCard 4M (\$289). ACE also has uncompressed SRAM cards available.

DoubleFlash - SunDisk ATA flash cards with compression software built in. They work with any HP Palmtop and range from the DoubleFlash 3M (\$199) to the DoubleFlash 40M (\$979).

DoubleFlash+ - IBM ATA FlashRAM cards with built-in file compression software. These are the newest flash card technology with close to SRAM read/write performance. They work with the 100/200LX but not the 95LX. They range from the Dou-

bleFlash+ 6M (\$239) to the DoubleFlash+ 80M (\$1,499).
[See Advertising, page back cover.]

COMPANY: ACE Technologies, Inc., 592 Weddell Drive, #6, Sunnyvale, CA 94089, USA; Phone: 800-825-9977 or 408-734-0100; Fax: 408-734-3344.

Adtron Memory Cards

Offers SRAM, ATA flash and other Type II PCMCIA cards. Prices vary.

COMPANY: Adtron Corp., 3050 S. Country Club Dr. Suite 24, Mesa, AZ 85210, USA; Phone: 602-926-9324; Fax: 602-926-9359.

AMP Memory Cards

AMP offers Flash-5 flash memory cards that have a program/erase algorithm and sector sizes of 128 to 512 bytes, allowing you to access, modify, and save data faster than conventional flash memory cards. The software needed for the HP Palmtops to read the Flash-5 cards is pre-installed on the card. However, you must modify your Palmtop's CONFIG.SYS file to read the cards.

AMP also offers SRAM memory cards.

CONTACT: AMP Product

Information Center, P.O. Box 3608 M/S 38-03, Harrisburg, PA 17105-3608, USA; Phone: 800-522-6752; Fax: 717-986-7575.

Centennial Memory Cards

The ReCharge Card is a Type I SRAM card with a fully rechargeable data backup battery. A built-in charging circuit active during operation keeps the ReCharge card operational for years without replacing the battery. Available in 256K to 4MB capacities (1MB - \$159, 2MB - \$259).

Centennial also offers the Palm Flash cards in capacities from 256K to 2MB (1MB - \$110, 2MB - \$185). Flash filing system software must be installed on the 100/200LX in order for the Palmtop to read these cards.

CONTACT: Centennial Tech., Inc., 37 Manning Road, Billerica, MA 01821, USA; Phone: 800-535-3668 or 508-670-0646; Fax: 508-670-9025.

DIP Systems Memory cards

DIP offers SRAM cards from 128K (£33) to 2MB (£249).

COMPANY: DIP Systems, 32 Frederick Snager Road, Surrey Research Park, Guildford, Surrey, GU2

PCMCIA Memory Cards: Differences and Prices

SRAM cards come in capacities from 64K to 2MB. The card uses a small backup battery to keep card's volatile memory alive. SRAM cards should work with any HP Palmtop.

ATA flash cards at this time are made by SunDisk and IBM and marketed by a number of other vendors. ATA Flash cards have a built-in controller that is faster and, according to SunDisk, more reliable than the flash filing system described below. ATA Flash memory mimics the file structure of a PC hard disk drive and uses the same 512 byte sector size. This makes ATA cards 100% compatible with all MS-DOS applications and utility software. ATA flash cards can be used in any computer that supports the Release 2.0 PC Card ATA standard, including the HP 100/200LX, most notebook PCs and PC card drives. ATA cards come in capacities from 2.5MB to 41.9MB. ATA flash disks should work with the HP 100-/200LX. Some of the earlier versions do not work with the HP 95LX, so check with the vendor before purchasing.

Flash memory cards are different from the ATA flash disks described above. Vendors like Intel and AMD make flash memory cards without a built-in controller, that mimic EPROM memory and use a very large block size (64Kbytes). These cards require one of the various software Flash File Systems provided by Microsoft, M-Systems or SCM to be installed in your PC. You cannot mix and match flash filing system software from different vendors. Some cards may work in the HP 100/200LX, but require flash filing system software to install and work on the HP 100/200LX. If you buy one of these types of cards, carefully check to see that the vendor has tested the card on the HP 100/200LX and will give you a money back guarantee.

Memory card prices vary and continue to move downwards. Any prices listed in this section may change. Typical prices for a SRAM card as of Sept 94 are \$150 for a 512K card and \$280 for a 2MB card. Typical prices for ATA flash cards are \$350 for a 2.5MB card to \$1,200 for a 20MB card. Typical prices for flash memory cards are \$95 for a 256K card to \$995 for a 20MB card.

5XN, ENGLAND; Phone: 0483 301555; Fax: 0483 578072.

Envoy Data Memory Cards

Envoy offers SRAM and ATA flash cards and SRAM and ATA Extreme Environment Cards sealed to protect against environment and extreme operating temperatures. Regular and extreme environment SRAM cards come in capacities up to 2MB (\$259/\$370). Regular and Extreme Environment ATA flash disks come in capacities from 5MB (\$432/\$360) to 41.9MB (\$2495/\$3,000).

Envoy also offers Flash Memory cards, with built in True Flash File System, for the HP 100/200LX. Flash memory card capacities range from 1MB (\$195) to 19.6MB (\$1,395).

[See Advertising, page 33.]

CONTACT: *Envoy Data Corporation, 953 East Juanita Avenue, Suite A, Mesa, AZ 85204, USA; Phone: 602-892-0954; Fax: 602-892-0029.*

Epson Memory Cards

Epson offers SRAM (512K to 2MB, \$129 to \$269) and ATA Flash cards (2.5MB to 20MB, \$299 to \$999) for the HP Palmtops.

CONTACT: *Epson Direct, 20770 Madrona Ave., Torrance, CA 90509, USA; Phone: 800-374-7300; Canada: 800-463-7766; Latin America: 305-265-0092; Fax: 310-782-4455.*

HP Memory Cards

Hewlett-Packard Company provides ATA flash disk cards with Stackler file compression software pre-loaded. HP offers the following cards (uncompressed capacity) 5MB (\$375), 10MB (\$600) and 20MB (\$999) ATA flash disk cards for the HP Palmtops and Omnibook.

CONTACT: *HP Dealers worldwide. HP memory cards are also available from selected third-party vendors.*

Magic RAM Memory Cards

SRAM memory cards for the HP Palmtops manufactured by Magic RAM. Cards come with dual battery protection, preventing loss of data during replacement of the primary battery. Available in 256K, 512K, 1MB and 2MB capacity.

CONTACT: *Magic RAM, 1850 Beverly Blvd, Los Angeles, CA 90057, USA; Phone: 213-413-9999; Fax: 213-413-0828.*

Maxtor Flash Memory Cards

The MobileMax Flash Memory Card product line consists of a series of PCMCIA Type I flash memory cards in capacities of 1MB to 20MB. MobileMax cards come with flash filing system software installed on the card. Insert the card into the memory card slot of a 95LX or 100/200LX and type **A:INSTALL** from the DOS prompt. The MobileMax card configures itself for your system.

CONTACT: *Maxtor Corporation, 211 River Oaks Parkway, San Jose, CA 95134, USA; Phone: 408-432-1700; Fax: 408-432-4510; Telex: 171074.*

New Media Flash Cards

Offers SRAM cards available in capacities from 256K (\$75) to 2MB (\$279).

CONTACT: *New Media Corporation, One Technology, Building A, Irvine, CA 92718, USA; Phone: 800-453-0550 or 714-453-0100; Fax: 714-453-0114.*

PalmTree Memory Cards

Offers SRAM and ATA flash disk cards in varying capacities. SRAM cards

range from 512K (\$159) to 2MB (\$349). ATA flash cards vary from 2.6MB (\$399) to 10.4MB (\$999).

COMPANY: *PalmTree Products, Inc., 145 Washington Street, Norwell, MA 02061, USA; Phone: 617-871-7050; Fax: 617-871-6018.*

Premax Memory Cards

Premax offers dual battery SRAM in capacities from 512K (\$99) to 2MB (\$279) and ATA flash cards in capacities from 5MB

(\$349) to 20MB (\$899).

CONTACT: *Premax Corporation, National Sales Office, Phone: 714-851-8242; Fax: 714-851-8249.*

Prolinera ProFlash Cards

ATA flash cards with compressed capacities from 2MB to 40MB.

CONTACT: *Prolinera Corp., 150 N. Santa Anita Ave., Ste. 300, Arcadia, CA 91006, USA; Phone: 800-759-0881 or 818-821-1881; Fax: 818-821-1879.*

Seagate FlashCards

Seagate markets SunDisk ATA flash cards in capacities from 1.8MB to 20.9 MB (uncompressed) and has Stackler compression software available.

CONTACT: *Seagate International, 920 Disk Drive, Scotts Valley, CA 95067, USA; Phone: 408-438-8111; Fax: 408-438-7852.*

Quatech Memory Cards

Quatech offers SRAM

memory cards in 1MB and 2MB capacities, starting at \$295.

CONTACT: *Quatech, 662 Wolf Ledges Parkway, Akron, OH 44311, USA; Phone: 800-553-1170; Fax: 216-434-1409; BBS: 216-434-2481.*

Simple SRAM and Flash Cards

Simple offers SRAM and ATA flash cards. SRAM cards are available in capacities from 256K

PLUG INTO YOUR DESKTOP!



PCMCIA CARDrive

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*ACMA Computers, Inc.
47988 Fremont Blvd. Fremont, CA 94538
(510)623-1212 Fax (510)623-0818*

OEMs
Welcome!

Specifications subject to change without notice.

A082394

(\$115) to 2MB (= \$500). ATA flash cards are available in capacities from 2MB (\$200) to 16MB (\$1,000).

CONTACT: Simple Technology, 3001 Daimler Rd., Santa Ana, CA 92705, USA; Phone: 714-476-1180; Fax: 714-476-1209.

100/200LX

Severe Environment Cards

This 40MB (\$1,540) hermetically sealed ATA flash "Guardian" memory cards can withstand exposure to water immersion, moisture, rough handling, temperature and weather extremes, harsh industrial environments, and electromagnetic interference.

CONTACT: Raymond Engineering, 217 Smith St., Middletown, CT 06457-9990, USA; Phone: 203-632-4334; Fax: 203-632-4329.

SunDisk Flash Memory Cards

SunDisk manufactures high-capacity Mass Storage Cards (specially engineered ATA Flashdisks) in capacities 1MB (\$249) to 40MB (\$1,499). Prices include file compression software, effectively doubling the rated capacities.

CONTACT: SunDisk cards are sold at numerous retail outlets including Compu USA, Circuit City, Fry's Electronics, Computerland, Radio Shack, and NCA. They are also privately labeled by numerous firms, including: Hewlett-Packard, IBM, Casio, Fujitsu, Seagate and Verbatim.

For more information, contact: SunDisk Corporation; Phone: 408-562-0500; Fax: 408-562-3403.

Card Readers

[Card drives add one or more PCMCIA slots to your desktop PC. Two

companies makes card readers that connects to a Macintosh SCSI port (see SCSI references below). When ordering a card drive, tell the vendor the type of computer you will be installing it in to confirm that it will work in that computer. System software will have to be installed on your desktop so it can read the memory cards. Without the appropriate device drivers some cards may not work in your PC. All products are available now unless otherwise indicated.]

Adtron Card Drives

Adtron makes a whole series of solid state Data Drives including external and internal single- and dual-card drives with serial, parallel, or PC Bus interface. The external drives connect to the PC either via the serial or parallel port; the internal drives fit inside the PC.

External Drive/serial interface

Pricing \$295

External Drive/parallel interface

Pricing \$295

Internal Drive/IDE interface (dedicated drive, memory cards only)

Single drive \$250

Dual drive \$405

ROM Card Programming Option (for external serial or parallel drive)

Pricing \$100

Internal Dual Drive (full support, memory and I/O cards)

Rear access . . . \$199

Front access . . . \$250

COMPANY: Adtron Corp., 3050 S. Country Club Dr., Suite 24, Mesa, AZ 85210, USA; Phone: 602-926-9324; Fax: 602-926-9359.

ATA/X Data Exchange Device

Allows Palmtop users to easily transfer data files and applications between a desktop PC and the

The desktop ThinCardDRIVE™ transfers data effortlessly between Palmtops and MS-DOS® or MS-Windows® PCs. Plugs right into the printer port. Pass-thru feature retains printer operation. Model TMD-500 reads and writes SRAM cards, TMD-550 SRAM & FLASH cards. Fully PCMCIA/JEIDA compatible, with the industry's broadest range of card supplier and platform support. It's quick and easy.

Isn't it time you put one on your expense report?

For further information: **Databook Inc.**
Sales Office: 10 Alder Bush, Rochester, N Y 14624
Tel: 716-889-4204 Fax: 716-889-2593
OEM/Dealer inquiries welcome.

DATA BOOK
INCORPORATED

PC Card
ThinCardDRIVE is a trademark of Databook, Inc.

Palmtop. Accepts Type II and III ATA flash cards. Accommodates "hot insertion/removals."

This drive mounts internally in the same fashion as a floppy drive and comes complete with 16-pin interface, cabling, and Device Management Software.

Pricing
Internal unit . . . \$99.95
External unit . . \$149.95
CONTACT: ProTégé Corporation, 4165 E. La Palma, P.O. Box 68031, Anaheim, CA 92817, USA; Phone: 800-995-4453 or 714-961-7030; Fax: 714-961-1162.

CardDock PCMCIA Card Readers

These PCMCIA Card reader/writers support all PCMCIA-compliant cards, both 3 volt and 5 volt, and mount internally in your

desktop PC.

The CardDock is a front load internal drive that fits in an empty floppy drive bay. It supports 5 volt and 3 volt PC cards, Types I, II, and III.

The OutBack is a rear loading drive that fits in a 16-bit ISA AT slot.

The MiniCardDoc is a front load internal drive that fits in a 3.5, half-height slot.

The units come with necessary hardware and software for installation.

Pricing
CardDock \$199
OutBack \$99
MiniCardDock . . \$129
Four-bay drive . . \$398
CONTACT: Greystone Peripherals Inc., 130-A Knowles Drive, Los Gatos, CA 95030, USA; Phone: 408-866-4739; Fax: 408-866-8328.

CardLink Drive

The CL680 is an external card drive that connects to your desktop PC's parallel (printer) port and accepts type I and II PCMCIA cards. It reads both ATA flash cards and SRAM memory cards.

Pricing \$189.95
CONTACT: Steele Creek Technologies, 14035 Appaling Lane, Charlotte, NC 28278, USA; Phone and Fax: 704-588-1780.

CardPro Universal Card Drives

CardPro, available in internal or desktop versions provides the ability to read and write (as appropriate) to all types of PCMCIA-compatible memory cards, I/O cards and ATA hard drives.

Pricing starts at . . . \$339
CONTACT: DATA IO,

10525 Willows Road N.E., P.O. Box 97046, Redmond, WA 98073-9746, USA; Phone: 800-332-8246; Fax: 206-869-7423.

CARDport Card Drives

PCMCIA card drives for portable and desktop PCs. Read Type I, II, and III cards.

CARDport fax is an internal drive that connects to your desktop PC's ISA bus and lets you use PCMCIA fax/modem cards in your PC using standard software without the need to install additional system drivers.

CARDport eX is a battery-powered drive that plugs into the parallel port of any computer using a standard cable. It will read from and write to SRAM, Flash ROM, and PCMCIA hard drives.

CARDport ide is an internal card drive that connects to the IDE I/O controller cards and supports PCMCIA ATA Type III hard drives.

CARDport isa is a PC card drive in the form of a half-size PC expansion card, which plugs into the ISA (AT) bus of your computer. It provides two PCMCIA sockets: one at the front in a spare disk drive bay, and one at the rear of the computer. *CARDport isa* supports all types of PCMCIA cards, including hard disk drives,

fax/modems, LANs, etc.

Pricing

- CARDport Fax . . . \$99
- CARDport eX . . . \$299
- CARDport isa . . . \$299
- CARDport ide . . \$119

CONTACT: *CNF, Inc.*, 17705 Hale Ave., Bldg I, Morgan Hill CA, 95037, USA; Phone: 408-778-1160; Fax: 408-779-6558.

Databook ThinCardDrive

External and internal drives transfer data between Palmtops and MS-DOS or MS-Windows

PCs.

[See Advertising, page 40.]

Pricing

- Internal Drive
- TMB-240 \$249
- TMB-250 \$299

External Drive

- TMD-550 \$249

CONTACT: *Databook Inc.*, 10 Alder Bush, Rochester, NY 14624, USA; Phone: 716-889-4204; Fax & Modem: 716-889-2593.

Dual Slot-Board

A universal PC Card drive which supports all PCMCIA compatible PC Cards. It is installed in any 16-bit

ISA/EISA PC and consists of a short 16-bit controller card with an integrated Type III card slot in the back of the PC and a 3.5" drive unit installed in the front drive bay.

Pricing call CONTACT: *CSM GmbH*, Mörkestrasse 58, 70794 Filderstadt, GERMANY; Phone: (+49) 711/773071; Fax: (+49) 711/7776666.

Impression CARDrive

Dual slot internal card drive accepts Type I, II

and III and single Type IV cards. Compatible with any 386, 486, or Pentium system with an available 16-bit slot. Installs in any 3.5" or 5.25" drive bay.

Pricing \$199 CONTACT: *Acma*, 47988 Fremont Blvd., Fremont, CA 94538, USA; Phone: 800-786-6888 or 510-623-1212; Fax: 510-623-0818.

Little Drive PCD

This internal PCMCIA card reader for PC compatible computers fits into

the floppy disk bay. The Little Drive supports Type I, II, and III PCMCIA products. The drive contains two slots which can accommodate PCMCIA cards, hard drives and I/O products. The system consists of the internal card drive, a controller board, cables and system software.

Pricing \$179.95 CONTACT: *Coastal Electronics*, 5724 La Jolla Hermosa, La Jolla, CA 92037, USA; Phone: 800-PC1-LINK; Fax: 619-454-2611.

The uncompressed truth about memory cards.

When is a meg a meg? Only when you're talking about *uncompressed* storage capacity.

Data compression is great. But think twice about memory cards that promise big capacities using compression — because the truth is that *what* you compress determines how much storage *you get*.

The right way to judge memory cards? Compare prices based on *uncompressed* capacities. The perfect way to build lasting memories? Be sure the capacity you need is the capacity you get — with very affordable FLASH-5 Memory Cards from AMP.

Matched with your 95LX or 100LX Palmtop, FLASH-5 cards offer fast write/erase and on-chip data protection to safeguard your info. And because they require only 5 volts to write, they cut power drain and prolong battery life. Call for a copy of our "Low Cost of Ownership" study to learn more about the advantages of 5-volt flash memory from AMP.

Delivery? In a flash! Backed by toll-free help, and our guarantee of satisfaction.

1MB \$170⁰⁰

also available:

- 256KB \$95.00
- 512KB \$120.00
- 2MB \$276.00

Prices shown expire 12/31/94

AMP is a trademark. PC Card is a trademark of PCMCIA.



Call today!

1-800-488-8459

AMP

MEL-PCJ Station

MEL-PCJ Station is a universal card drive for PCMCIA standard 68 pin memory cards. It may be used to read from or write to RAM, EEPROM, and Flash EPROM cards and can be used for data exchange between the HP Palmtop and a desktop PC computer. The data transfer takes place via standard RS-232 interface with 115,000 baud.

The MEL-PCJ Station comes with software that allows it to be installed as an additional DOS drive for the PC or the HP Palmtop.

Pricing (Deutsche) . . . 790
CONTACT: CSM GmbH, Mönkestrasse 58, 70794 Filderstadt, GERMANY; Phone: (+49) 711/773071; Fax: (+49) 711/7776666.

Microchannel PC ATA Card Drive

External card drive that allows Palmtop users to easily transfer data and applications between a desktop Microchannel PC and the Palmtop. Accepts Type I, II, and III ATA flash cards. Includes card drive, controller card, cable and software.

Pricing \$349
CONTACT: ProTégé Corporation, 4165 E. La Palma, P.O. Box 68031, Anaheim, CA 92817, USA; Phone: 800-995-4453 or 714-961-7030; Fax: 714-961-1162.

OmniDrive LC

PCMCIA drive that connects to a parallel port of a PC-compatible computer and allows it to read/write PCMCIA memory cards as well as Seagate/Sundisk ATA flash cards. The printer port is passed through. The powered version can accept PCMCIA Type III hard disks.

Pricing (Deutsche) . . . 700
CONTACT: CSM GmbH, Mönkestraße 58, 70794

Filderstadt, GERMANY; Phone: ++49-711-773071; Fax: ++49-711-7776666.

PalmTree Card Drives

These PCMCIA reader/writers, manufactured by DataBook Inc., enable a desktop system to access PC Cards compatible with PCMCIA 2.0/JEIDA 4.1, including Intel ExCA, ATA cards and Type III rotating media cards. Microsoft FFS-2 support includes a full range of PCMCIA tuples for broadcast compatibility. CardTalk Control Panel GUI software included.

The External drive connects to the parallel port of any PC compatible computer.

The internal drives come with a half-length AT-bus card, interconnect cable and 3.5" & 5.25" mounting brackets.

Pricing external . . . \$299
Pricing internal drive
Single slot \$249
Dual slot \$299
COMPANY: PalmTree Products Inc., 51 Sawyer Road, Suite 150, Waltham, MA 02154; 617-891-3880; Fax: 617-647-4075.

Peripherals Direct Flash-Disk/Card Drive Combo

Offers a Protege internal card drive with a SunDisk ATA flash card in one package. Capacities listed below achieved with the Stacker 3.0 software option.

Pricing card drive with
2MB flash disk . . \$199
3.6MB flash disk \$249
5MB flash disk . . \$299
10MB flash disk . \$399
CONTACT: Peripherals Direct, 3350 Scott Blvd., Bldg.7, Santa Clara, CA 95054, USA; Phone: 800-724-3000.

Premax Card Drive

Internal card drive with dual slots. Accepts two

Type I or Type II, or one Type II and one Type III card. Also accepts some Type II I/O cards. Reads/writes SRAM, Flash and hard drives.

[See Advertising, page 33.]

Pricing \$195
CONTACT: Envoy Data Corporation, 953 East Juanita Avenue, Suite A, Mesa, AZ 85204, USA; Phone: 602-892-0954; Fax: 602-892-0029.

Quatech Card Drives

Internal card drive supports Type I, II, and III memory and I/O cards. One version adds a front and a back card slot to your PC. Another version adds a double slot to the front of your PC.

Pricing
Front/back \$295
Double front \$295
CONTACT: Quatech, 662 Wolf Ledges Parkway, Akron, OH 44311, USA; Phone: 800-553-1170; Fax: 216-434-1409; BBS: 216-434-2481.

SCM SwapBox

Lets you read/write to your PCMCIA cards from your desktop PC. SCM offers six products:

Lite - an economical, rear-access, single socket PCMCIA card reader mounted in an I/O slot in the back of your desktop PC.

Lite X2 - dual sockets mounted in I/O slot.

Classic - a single socket PCMCIA card reader mounted in a front, 3.5" drive bay.

Classic X2 - dual front mounted sockets.

Premium - a dual socket system, with front and rear access to PCMCIA cards.

Premium X2 - dual rear and dual front sockets.

All products come with necessary cables, cards, and installation instructions.

Pricing

SwapBox Lite \$99
Lite X2 \$229
SwapBox Classic . . \$179
Classic X2 \$269
SwapBox Premium \$269
Premium X2 \$499

CONTACT: SCM Microsystems, Inc., 985 University Ave., Suite 7, Los Gatos, CA 95030, USA; Phone: 408-395-9292; Fax: 408-395-8782.

SCSI PCMCIA Card Drive (for Macintosh)

MCDISK-1 is an external desktop PCMCIA drive with a built-in power supply and a 1MB/S SCSI-compatible interface that supports the complete SCSI command set and SCSI address select. MCDISK-1 accepts all types of SRAM, Flash EPROM and One Time PROM's (OTP) memory cards with capacity up to 64MB, as well as the new ATA flash cards. It comes with two SCSI connectors and can be easily installed in any UNIX, VME, Macintosh or PC system equipped with an SCSI adapter. Software drivers are available for most of these systems.

Requires SCSI Interface
Pricing \$675.00
CONTACT: Gespac, Inc., 50 W. Hoover Ave., Mesa, AZ 85210; Phone: 602 962-5559; Fax: 602 962-5750.

SCSI Litronic Card Drive (for Macintosh)

External drive that connects to an SCSI II interface and reads/writes PCMCIA Rel 2.0 memory cards.

[See Advertising, page 33.]

Pricing \$495
CONTACT: Envoy Data Corporation, 953 East Juanita Avenue, Suite A, Mesa, AZ 85204, USA; Phone: 602-892-0954; Fax: 602-892-0029.

Fax/Modem Cards

100/200LX

[With the exception of New Media's 95LX Palm-Modem, the Fax/Modem cards listed only work with the HP 100/200LX.]

There many PCMCIA 2.0 fax/modem cards available and it is impossible for The HP Palmtop Paper to test them all on the 100/200LX. We have published those represented by the manufacturer or Hewlett Packard to work with the HP Palmtop.

Those represented to work by HP have been tested as follows: The modem feature of the card was confirmed to work in DataComm and cc:Mail Mobile (built into the 100/200LX). The fax feature was confirmed to work with a third-party fax program called PCPlus.

In some cases we list that the modem has been tested, without mentioning the fax. This does not necessarily mean that the fax does not work, only that we have no information that it has been tested and confirmed to work.

There are many additional PCMCIA 2.0 fax/modem cards available that may work with the HP 100/200LX. If you are considering another fax/modem card, you should carefully question the vendor or manufacturer about whether it has been successfully tested with the 100/200LX. Many PCMCIA 2.0 fax/modem cards should work with the 100/200LX (not the 95LX). However, the communications and fax software that comes with them may be too large to fit on your Palmtop.]

Angia SafeJack Fax/Data Modem

A 19.2K PCMCIA Type 2, Fax/Data modem with 2

on-board RJ-11 sockets. Works on the HP 100/200LX and other PC's with a PCMCIA 2.0, type II or III card slot (like the HP OmniBook 300).

Supports error correction (V.42, MNP 2-4) and data compression (V.42, bis, MNP5) protocols. Also supports Hayes Auto-Sync protocol.

Meets CCITT and Bell standards. Includes auto dial, auto answer, and full or half duplex.

Modems tested by: Manufacturer
Pricing \$249
CONTACT: Angia Communications, Inc., 441 East Bay Boulevard, P.O. Box 50540, Provo, UT 84605, USA; Phone: 800-877-9159 or 801-371-0488; Fax: 801-373-9847.

Centennial Fax/Modem Cards

Two PCMCIA Type II fax/modem cards. The 24/96 is a 2400 bps data modem and a 9600 fax modem. Centennial also markets a 14.4Data/Fax modem designed for land-line use and transmitting over Cellular carriers.

Modem/Fax tested by HP
Pricing
24/96 \$151
14.4 \$399
CONTACT: Centennial, Inc., 37 Manning Road, Suite 1, Billerica, MA 01821, USA; Phone: 800-535-3668 or 508-670-0646; Fax: 508-670-9025.

Chaplet Ego 14400 Fax/Modem Card

The PCMCIA-card modem with functional fax sends and receives data and faxes at 14,400 bps. Ego Fax/Modem includes V.42 bis protocol, which enhances the speed by compressing data and insures error-free data transmission. Three operating modes conserve system's battery when not in use.

Modem/Fax tested by HP
Pricing \$225
CONTACT: *Chaplet Penpherals, 252 North Wolfe Rd., Sunnyvale CA, 94086, USA; Phone: 800-308-3388 or 408-732-7950; Fax: 408-732-6050; CompuServe ID: [76004,3660].*

DataFlex Gem Fax/Modem
DataFlex offers a 2400 data/9600 fax card.

Modem/Fax tested by HP
Pricing \$229
CONTACT: *DataFlex, 1012 Lombard Road, South Wimbledon, London, ENGLAND SW19 3TZ; Phone: 081 543 6417; Fax: 081 543 7029.*

Epson Fax / Modem Cards
Epson offers a 14.4Kbps fax/modem card, and a card with 2.4Kbps Fax and 9.6Kbps Modem.

Tested by Manufacturer
Pricing
14.4Kbps \$199
2.4/9.6Kbps \$49
CONTACT: *Epson Direct, 20770 Madrona Ave., Torrance, CA 90509, USA; Phone: 800-374-7300; Canada: 800-463-7766; Latin America: 305-265-0092 Fax: 310-782-4455.*

GVC Fax/Modems
GVC PFM 964324 is a 2400 data / 9600 fax modem card.

GVC FM144/144V (P) is a 14,400 data / 14,400 fax modem. Both units include data compression/error control and sleep and standby modes to reduce power usage. The FM144/144V unit includes a built-in telephone interface and hot insertion capability, and comes with WinFax Lite fax/data software for DOS and Windows and a five year warranty.

GVC PFM tested by HP
GVC FM 144 tested by: Manufacturer

Pricing
GVC PFM 964824 call
GVC FM 144 \$289
CONTACT: *GVC Technology, Inc., Lafayette Road, Sparta, NJ 07871, USA; Phone 800-289-4821 or 201-579-3630.*

IBM Fax/Modem Cards
IBM offers a 14,400 data / 14,400 fax modem card and a 2400 data / 9600 fax modem card.

Modem/Fax tested by HP
Pricing
14.4/14.4 \$299
2400/9600 \$239
CONTACT: *IBM Corporation, P.O. Box 12195, Research Triangle Park, NC 27708, USA; IBM PC Direct: 800-426-2968.*

Intel PCMCIA 24/96 and 96/96 Data/Fax

Both the 2400 data, 9600 fax and the 9600 data, 9600 modems support error correction and data compression using V.42/V.42bis. Works with the HP 100/200LX's Datacomm and CC: Mail mobile applications. Following software included with the Intel 24/96 does not work on the 100/200LX: Card Manager, FAXability, and HyperACCESS.

Tested by: HP
List price
Intel 24/96 \$149
Intel 96/96 \$249
CONTACT: *Intel Corporation, 2200 Mission College Blvd., 6 Santa Clara, CA 95052, USA; Phone: 800-538-3373 or 916-356-3551; Fax: 800-525-3029.*

Megahertz Fax/Data Modem Cards

These modems provide advanced error correction and use the Hayes AT command set, as well as Bell and CCITT standards and protocols to provide worldwide compatibility. The Megahertz XJack fax/modem cards have a retractable RJ-11 connector that pops out of one end of the card and connects to an RJ-11 phone jack via a six foot cord.

Users report problems using the XJack cards' fax software on the 100LX. ACE technologies sells the XJack cards with ACE-FAX, a menu-driven send/receive fax program for the HP Palmtops. [See Advertising, page back cover.]

Modem/Fax tested by HP
XJack Fax function also tested by: ACE
(Confirmed to work with

ACE-FAX software.)
Pricing (ACE Technologies)
14400 XJACK .. \$259
2400/9600 XJACK \$159
(ACE-FAX represented by ACE to work with some other fax/modem cards.)
ACE CONTACT: *ACE Technologies, Inc., 592 Weddell Drive, #6, Sunnyvale, CA 94089, USA; Phone: 800-825-9977 or 408-734-0100; Fax: 408-734-3344.*

Pricing (Megahertz)
14400 card \$249
2400/9600 card .. \$115
14400 XJack \$259
2400/9600 XJack \$115

MEGAHERTZ CONTACT: *Megahertz Corporation, 605 North 5600 West, Salt Lake City, UT 84116, USA; Phone: 801-320-7000; Fax: 801-320-6002.*

NEC 14.4 Data/Fax Card
A 14.4Kbps card fax/modem with V.42 and MNP 2-4 error control and V.42bis and MNP5 data compression.

Modem/Fax tested by HP
Pricing \$323
(Plus state tax)
CONTACT: *NEC Technologies, Inc., 1414 Massachusetts Avenue, Boxborough, MA 01719-2298, USA; Phone: 800-632-4636; NEC Direct Sales: 800-615-5566.*

95LX 100/200LX New Media PalmModem

New Media is the only manufacturer that offers Fax/Modem cards that work with both HP Palmtops. These 2400 baud modem cards fit in the Palmtop's memory card slot. Resident in the PalmModem is PalmTerm, a terminal emulation program optimized for Palmtop computer use. A variety of upload and download protocols are provided with the terminal emulation program.

PalmModem comes with resident facsimile processing and transmitting software. 128K of

on-board RAM is available on PalmModem for conversion of text to fax transmittable data without using the Palmtop's resources.

Modem/Fax tested by HP
(Must use data/fax software built into card.)

Price
100/200LX
PalmModem ... \$119
95LX
PalmModem ... \$119
Upgrade from
95LX version \$45
CONTACT: *New Media Corporation, Irvine Spectrum, One Technology, Building A, Irvine, CA 92718, USA; Phone: 800-453-0550 or 714-453-0100; Fax: 714-453-0114.*

Nokia PC Card Fax/Modem

A 14.4 Kbit fax modem card that can be connected to a Nokia cellular phone to transmit and receive data/fax. The fax/modem card uses ETC-1 cellular error cor-

recting protocol and supports V.32bis, V.42, V.42bis. The fax/modem card works with Nokia cellular phone models # 121, PT 128, 2120, and 232.

Modem/fax tested by: AT&T Paradyne Price

Fax/modem \$449
Cellular phone . . . varies
CONTACT: *Nokia Mobile Phones, Inc., P.O. Box 2930, Largo, FL 34649-2930, USA; Phone: 800-666-5553; Fax: 813-530-3599.*

Practical Peripherals PracticalCARD

A 14,400 bps V.32bis data/fax modem supporting V.42 error correction and data compression.

Fax/Modem tested by: Manufacturer
List price \$349
CONTACT: *Practical Peripherals, 375 Conejo Ridge Avenue, Thousand Oaks, CA 91361, USA; Phone:*



Opus 63
Design Lab

Pocket Liberator

HOLSTERS™ patent pending

Opus 63
Design Lab

Pocket Liberator-Palm Top Holster

The PL-PTH is a palm top carrying system designed to allow 100% mobility to keep your information safely, securely, and at your fingertips.

- The Main Compartment is designed to hold most palmtop brands. It can also hold most cellular phones, walkmans, and items of similar scale. *It's angled design allows easy access - more available than in your briefcase and safer than your jacket pocket.*
- Flaps with Velcro fasteners secure the items from accidental droppage.
- The standard PLH harness pivot-type assembly provides 100% flexibility and mobility and is secured to a belt loop which pivots and unsnaps for easy harness removal.
- Flexible Velcro adjustments allow the PL-PTH to conform to fit your body.
- The Secondary Compartment is piggy-backed to the Main Compartment to house beepers, business cards, batteries, etc.
- The front of the Main Compartment is made of 100% fine leather.
- The PL-PTH is virtually undetectable under unbuttoned jackets.



Only \$110
plus shipping and handling

Opus 63
Design Lab Inc.

43-49 10th Street, 3rd Fl. L.I.C., N.Y. 11101
fax: 718.706.7034

1.718.706.6787

PCMCIA PRODUCTS

800-442-4774 or 805-497-4774; Fax: 805-374-7200.

PIICEON Dispatcher

A v.32 bis 14.4K data/fax modem ready to connect to a cellular phone. Comes with V.42 data compression, class I and II capability.

Modem tested by: Manufacturer List price \$389 CONTACT: *PIICEON, Inc., 1996 Lundy Avenue, San Jose, CA 95131, USA; Phone: 408-432-8030; Fax: 408-943-1309.*

Psion Dacom Gold Card

We have no further information on this card, other than it works with the HP 100/200LX.

Modem/Fax tested by HP CONTACT: *Psion, England, Phone: 071 262 5580; Fax: 071 258 7218.*

Smart Modular Fax/Modem with Flash Memory

This PCMCIA fax/modem card combines communications capabilities and expanded memory in one PCMCIA Type II card. Intended for machines with only one PCMCIA slot (i.e. the HP 100LX/200LX), the card eliminates the need to switch between a fax/modem and memory card.

The cards modem provides data (2400 bps) and facsimile (14,400 send fax, 9600 receive fax) capabilities. The card complies with the V.42 and V.42 bis CCITT standards. Users connect the card to a telephone line with a one-piece cable that comes with the card. (See Smart Modular mini-review, page 29.)

[See Advertising, page inside front cover.]

Modem/Fax tested by: Manufacturer Pricing

with 2MB flash RAM \$29 with 4MB flash RAM \$399 CONTACT: *Smart Modular Technologies, Inc., 45531 Northport Loop West, Fremont, CA 94538, USA; Phone: 510-623-1231; Fax: 510-623-1434.*

100/200LX

Smart Exchange Fax/Modem

The 14,400 bps data/fax modem card has a power saving mode and flash memory to facilitate upgrading. Supports V.42 error correction and data compression.

Smart Modular also offers a 2400 data/9600 fax modem card.

14.4 Modem/Fax tested by: Manufacturer (Requires Bitfax software, shipped with the product.) 24/96 Modem/Fax tested by: HP Pricing

14.4 \$279 24/96 call

CONTACT: *Smart Modular Technologies, Inc., 45531 Northport Loop West, Fremont, CA 94538, USA; Phone: 510-623-1231; Fax: 510-623-1434.*

ThinFax BasicLX

This 9600 fax/2400bps modem card has EXP Mini-Fax software built directly into ROM memory on the card. Mini-Fax allows a user to Send and Receive faxes directly from the HP 100/200LX. The ThinFax card works on notebook computers with PCMCIA 2.0 slot (DOS/Win communications software required).

Modem/Fax tested by: Manufacturer (ThinFax has its own fax software built in to the card.) Price \$279 CONTACT: *EXP Computer, Inc., 12C Maunchly, Irvine, CA 92718, USA; Phone: 714-453-1020; Fax: 714-453-1319.*

POWER TRIP.

INTRODUCING THE NEW ZAP POCKET™, ZAP POUCH™, ZAP MODULE™ AND BIG ZAP MODULE™. SOLAR POWERED TOOLS FOR RECHARGING BATTERIES FOR YOUR PERSONAL ELECTRONIC GEAR ON THE TRAIL, IN THE CAR, ANYWHERE!

TOUGH, FLEXIBLE SILICON PHOTOCELLS ALLOW YOU TO CHARGE TWO OR FOUR AA NICAD BATTERIES OVER AND OVER AGAIN—FREEING YOU FROM THROW-AWAY BATTERIES AND WALL SOCKETS.

EVEN BETTER, THE ZAPS PROVIDE AN EASILY ACCESSIBLE HOME FOR YOUR POWER GIZMOS, STRAPPING TO YOUR PACK, YOUR HIP, OR ANYTHING ELSE HANDY.

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DANA DESIGN®

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I/O Cards

The previous section looked at fax/modem cards. This section looks at other input/output cards, including data acquisition cards, port adapters, and specialized applications.

95LX 100/200LX

Custom Barcode System

This general purpose barcode system is suited for inventory, order entry and tracking applications. The software lets you print custom labels on site and guides the operator with prompts and gives feedback and information while scanning. The software also connects the

data collector to applications programs running on the Palmtop, other PCs or Macs. The system comes with manual and free 800 # support. The software runs on the HP 95/100/200LX and comes on a PCMCIA memory card for data security and file storage. The Palmtop and the battery that powers the barcode scanner are enclosed in a water and shock resistant case.

Software Medium ... PCMCIA card (Comes with case, barcode reader, cable.)

Pricing varies (Depending on configuration.)

CONTACT: *Corvallis System Sales, 800 N Starker, Suite 35, Corvallis, OR 97330, USA; Phone: 800-733-5017; Fax: 503-752-7037.*

100/200LX

Data Acquisition Cards

The PCM-DAS08 is a PCMCIA test and measurement card that turns a palmtop or laptop computer with a Type II or III card slot into an analog data collection device. Insert the card into the card slot and connect it to the appropriate input sensor and collect data on voltage, electrical current, temperature, pressure, flow, or any other process variable.

These factory calibrated cards come with 8 or 28 channels for analog or digital input. They also come with installation and test software and a universal software driver to interface with custom or standard applications programs. Supports Quick

and Visual Basic, C and Turbo Pascal.

Availability ... Set/Oct 94 [Manufacturer developing system driver so card can work with HP 100/200LX.]

Pricing (PCM-DAS08) 8-channel analog input \$299 (OCN-D28C3) 28 Digital I/O \$199 Terminal boards and cables also available \$varies

CONTACT: *ComputerBoards, Inc., 125 High Street, Mansfield, MA 02048, USA; Phone: 508-261-1123; Fax: 508-261-1094.*

100/200LX

SIO Serial Interface Card

Lets you add a serial interface port to your HP 100/200LX or HP OmniBook computers. Built-in Card Information Structure

FREE

**BEST PALMTOP
TIPS ON DISK**

175 tips, 51 software
tools on 2.5 megabytes
with your *HP Palmtop
Paper on Disk* subscription



You've got the
knowledge.

Now get the tools.

*RENEW OR SUBSCRIBE TODAY
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PERFORMANCE!*

THE
HP Palmtop
Paper
ON DISK

*A SUPPLEMENT.
NOT A SUBSTITUTE.
FOR THE PRINTED EDITION.*

OR FAX: 515-472-1879

Thaddeus Computing, Inc. 57 E. Broadway, Fairfield, IA 52556 U.S.A.

allows automatic recognition and initialization of the SIO card. Comes in four versions (RS 2326, RS 422, RS485, and TTL).

Pricing call
CONTACT: CONTACT: CSM GmbH, Mönkestrasse 58, Filderstadt, GERMANY; Phone: (+49) 711/773071; Fax: (+49) 711/7776666.

100/200LX

Quatech Serial and Parallel Adapters

These PCMCIA Type II interface adapters add a serial or parallel port to the HP Palmtop. The manufacturer's technical support department states that although these devices have not been tested on the 100/200LX, they should work fine.

Pricing
 RS-232 Serial .. \$229
 RS-422/485 Serial \$229 (Mac serial port)
 Parallel port \$195
CONTACT: Quatech, 662 Wolf Ledges Parkway, Akron, OH 44311, USA; Phone: 800-553-1170; Fax: 216-434-1409; BBS: 216-434-2481.

100/200LX

Travel Floppy Drive with PCMCIA Interface

Travel Floppy 144 is a compact, lightweight external 3.5" floppy drive that connects to the HP 100/200LX via a cable that plugs directly into the 100/200LX card slot.

The Travel Floppy is not battery powered, but can be connected to the supplied power adapter when used with the 100/200LX.

PassportCard

Travel Floppy connects to computers via a PassportCard, a PCMCIA interface card attached to Travel Floppy's cable. Passport-

Card is available as a separate item to OEM manufacturers. Interested parties should contact the company directly.

[See Advertising, page 9.]

Pricing \$249
CONTACT: Accurite Technologies, Inc., 231 Charcoal Avenue, San Jose, CA 95131-1107, USA; Phone: 408-433-1980; Fax: 408-433-1716.

Wireless

100/200LX

Ameritech Wireless Field Messenger II

This PCMCIA 2.0 Type II messaging card allows mobile professional users of the HP 100/200LX to receive large streams of data, including full e-mail documents, other data documents such as charts and graphs, or full news stories. Users can update appointments, phone-books, databases, and 1-2-3 spreadsheets.

Users can subscribe to Ameritech information services, which provide up-to-the-minute news, sports, stock information, weather, horoscopes, and lottery information. You can send messages to the card using Ameritech's messaging software from your PC, Mac, or UNIX-based systems.

Necessary System Manager compliant software installs on the Palmtop directly from the PCMCIA card. Local, regional, and national messaging plans are available.

Availability Oct 1
 Pricing

Wireless Card .. \$299
 Messaging services varies

CONTACT: Ameritech, Wireless Field Messenger II, 2000 West Ameritech Center Drive, 3H25F, Hoffman Estates, IL 60195-5000, USA; Phone: 800-MOBILE-1; Fax: 708-765-3702.

Detect - Plot Radiation On Your HP 100/200LX



Also available: LCD-60 Digital readout for use without computer, RM-70 & RM-80 pancake units, as well as other types of sensors.

Open a door to the fascinating world of nuclear science with the **RM-60 Micro Roentgen Radiation Monitor**. This palm-sized unit detects Alpha, Beta, Gamma & X-Rays. Displays 1000 times the resolution of survey geiger counters. Track **Radon** gas. Find sources. **Check food, water, ceramic coffee mugs for contamination** (eye opening). Easy to setup and run.

Learn about radioactivity. Exciting computer application. Demonstrate alpha emission from smoke detector, beta and gamma emission from lantern mantle, other common items. Plot background cosmic rays, rocks, bricks, plane ride. Wipe tissue on T.V. screen then generate a beautiful decay plot of the collected Radium B (Radon daughter, half life: 27 mins.) Check TVs, CRTs for X-Rays (U.S. Dept. H.E.W. 21 CFR 1029.10).

Rugged and accurate digital circuitry, needs no adjustments. Draws a minuscule amount of power from HP's serial port. Cable extendable with telephone wire. Should last a lifetime.

Superb user friendly software including TSR program (run other programs simultaneously). Makes excellent dosimetry system, with alarm, real time graph, data logging and TSR. Medical personal, slip in pocket when making rounds. Add strobe - siren to meet OSHA's reg. 29CFR 1910.96 & 1910.97. Used by medical waste facilities, cancer treatment centers, water & sewer plants, universities (lessons available), nuclear facilities, high schools, scrape handlers, hobbyists. Works with any PC. Thousands sold for over five years. Call or write for **PC Mag. & Byte** reviews.

VISA/MC/EURO 45 day \$ back. Complete RM 60 System: \$149.50
To order or for more information call: (800) 729-5397
AWARE Electronics
P.O. Box 4299, Wilmington DE 19807 Phone/Fax: (302) 655-3800

100/200LX

HP StarLink Service

A "one-stop communications solution" from HP that includes a PCMCIA Type II Motorola NewsCard receiver with pre-installed HP StarLink software. Once connected to StarLink, the subscriber receives messages via the NewsCard receiver. Messages can be sent by anyone via a toll-free phone number.

Service ... Price (U.S.)

■ Basic (per mo) \$10.95

Provides message retrieval, forwarding, limited transmission, group messages, and bilingual operator dispatch. Each transaction is then charged by coverage type (local, single- or two-region, or nationwide). The following services are available:

■ Local (per mo) \$varies

Offers coverage in the customer's metropolitan area for as low as

\$19.95 per month, which includes 100 computer-transmitted messages per month. Windows-based computer message sending software for your desktop PC is free to subscribers. For \$29.95, customers can receive 50 operator-transmitted messages per month in their local area.

■ Regional (per mo) \$36.95

Provides coverage in several states in a geographic region. One- or two-region service is also available. Includes 50 operator-transmitted messages per month.

■ National (per mo) \$62.95

Provides service to all major metropolitan areas in the United States. Includes 50 operator-transmitted messages per month.

■ NewsCard with software \$229

PCMCIA wireless receiver with necessary software.

■ NewsLink (1st mo) \$free

\$5 per month thereafter if customer chooses to continue the service.

■ StockLink (per mo) \$39.95

Price (includes NewsCard PCMCIA card receiver and software \$229
CONTACT: Phone: 800-917-LINK or write directly to: Hewlett-Packard Company Inquiries, 1000 N.E. Circle Boulevard, Corvallis, OR 97330, USA.

100/200LX

Nokia Cellular Phone / Fax / Modem Combo

This Finnish company makes a Fax/Modem card that can connect to several models of their cellular phones to create a wireless fax/modem solution. (For more information, see the Nokia entry in the Fax/Modem section of this article.)

100/200LX

Wireless cc:Mail System

Wireless cc:Mail lets you access your cc:Mail mailbox from your 100/200LX

via the RAM Mobile Data service. Both your HP 100/200LX and your computer LAN server must be equipped with Intel wireless modem, or "Router" unit on your LAN server provides a direct, wireless connection between the customer's LAN-based network and the RAM wireless data networks.

RAM also offers dedicated wired server/network connections for users with more demanding needs.

The system requires an HP 100/200LX (which comes with cc:Mail software) and an HP Connectivity pack to transfer necessary software to the Palmtop. LAN networks must have cc:Mail Router V4.0 software installed.

Pricing
 Remote unit ... \$795
 Wireless modem cable \$20
 Router unit \$795
 cc:Mail Router software \$1,295

CONTACT: RAM Mobile Data, 600 Pinnacle Court, Suite 660, Norcross, GA 30071, USA; Phone: 404-662-1740; Fax: 404-662-1758.

100/200LX

MobileMate™

MobileMedia Communications Inc., one of the largest providers of paging services in the United States is now offering MobileMate to HP 100/200LX users. Through 36 offices, MobileMedia provides paging and other wireless services in 19 states and the District of Columbia, including ten of the ten largest metropolitan markets in the U.S.

MobileMate is the only wireless messaging card to completely integrate the antenna and battery into the PCMCIA 2.0 Type II form factor, providing the highest quality reception and lowest power consumption possible.

MobileMate provides the ability to receive messages, acting as an advanced alphanumeric pager. It can also provide the user with up-to-the minute information such as business and financial news headlines, stock-price information and flight updates. Appointment book, database and spreadsheet updates, as well as e-mail, can be received through MobileMedia's local, regional, and nationwide paging networks.

Pricing \$300
CONTACT: *MobileMedia Communications Inc., 65 Challenger Road, Ridgely Park, NJ 07660; Phone: 800-562-2830 or 201-440-8400 ext. 3074; Fax: 201-440-7657. In Ca, Nv, and AZ call: 714-457-7209.*

Software

This section lists software that is available on PCMCIA cards. Since almost any software can be put on PCMCIA card, this section focuses on software that is marketed on a PCMCIA card for the HP Palmtops. We also include software that is especially useful for HP Palmtop PCMCIA card users.

Communications & Fax/Modem

95LX 100/200LX

acCIS: CompuServe automa-tion software

Adapted and designed for the HP LX Palmtop series, acCIS accesses CompuServe and automatically uploads and downloads messages quickly. You read and write messages off line, saving on connect charges and phone bills.

Version 3.0 provides a powerful "scripting" language for automating special areas of CompuServe. This version of acCIS supports 40/80 column zoom on the 100LX and 200LX, and does not require additional software to run.

Runs under SysMgr . . Yes
Pricing on:

Floppy disk \$69
PCMCIA card \$329
(loaded on 2MB SRAM, 1.7MB free)

CONTACT: *Shier Systems & Software, 920 Hampshire Road, Suite A-29, Westlake Village, CA, 91361, U.S.A.; Phone: 805-371-9391; Fax: 805-371-9454; CompuServe ID: [75030,3374].*

95LX 100/200LX

Reflection-To-Go

A customized version of the popular connectivity software that is standard for desktops in HP 3000 shops. The initial release of Reflection-To-Go supplies HP terminal emulation and includes a scripting language, keyboard mapping, file transfer, and the ability to hotkey between other applications. It also offers enhanced modem dialing and screen handling and is streamlined to conserve memory.

Pricing \$199
CONTACT: *WRQ, Inc., 1500 Dexter Avenue North,*

Seattle, WA 98109, USA; Phone: 800-872-2829 or 206-217-7100; Fax: 206-217-0293.

95LX 100/200LX

Simple Simon Faxer 6.0

SSFAXER is a DOS Command Line fax program for the HP Palmtops that can SEND, RECEIVE, VIEW, PRINT and CONVERT fax files. It uses less memory than many other fax programs, 95K disk space for the program and 312K system RAM for sending and receiving.

Medium 3.5" floppy
Pricing \$19.95
(includes FREE one year subscription to BBS)

CONTACT: *Simple Simon Software, 1912 Central Drive, Station E, Bedford, TX 76021, USA; Phone: 800-574-8047 or 817-283-*

6691; Fax: 817-283-5871; BBS: 817-545-4833.

Engineering/Scientific

100/200LX

Pocket Consultant Engineer-ing Software

The following software is available on a PCMCIA card:

Fourier, Harmonic, and Transfer Function Analyzer \$349

Provides three engineering tools on a single PC Card: **Fourier** can be applied to examine the frequency spectrum characteristics of defined duration signals, such as group pulses; **Harmonic Analyzer** is specific to

repetitive wave forms (cyclic processes); **Transfer Function Analyzer** is a frequency spectrum analysis package.

Logic Designer and Simulator . \$249

The Logic Designer is an interactive digital design program which lets you probe the circuits performance before you build a prototype and experimentally examine all the input and output conditions.

Multi-Circuit Analyzer 399

An active, passive, linear, and filter analysis program for engineers, scientists and students.

PC Mathematics . . \$599

A mathematical procedures toolbox designed for engineers, scientists, and college students. It is

menu driven and covers several areas of interest, including: functions and equations, differential equations (including boundary value problems and nonlinear equations), regression, approximation and interpolation, linear algebra, multi-variable power series, more.

CONTACT: *Pocket-Consultant, 7420 Unity Avenue North, Brooklyn Park, MN 55443, USA; Phone: 612-229-6260; Fax 612-566-6727*

File Compression

Stacker 4.0

File compression software that can double the capacity of your memory card.

The Easiest Way to Transfer PCMCIA-ATA Data Between Your Palmtop & Your Desktop

Introducing the ATA/X™ Data Exchange Device... Now Only \$99⁹⁵

ATA/X provides a seamless PCMCIA-ATA data transfer path between your Palmtop and virtually any 16-bit ISA DOS PC...making your PCMCIA-ATA storage devices as easy to use as a floppy.

ATA/X supports ATA Flash Cards and 1.8" Hard Disks, accommodates "Hot" insertions/removals, uses standard MS-DOS utilities such as F-Disk and Format, and operates independently of the PC BIOS.

Available in internal (mounts in a 3.5" drive bay) or external configurations, the ATA/X can be added to your system even if it's technically full... and the need for complicated Card and Socket services is eliminated.



Call Today For More Information
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4165 East La Palma Ave.,
Anaheim, Calif. 92807
(714) 961-7030 FAX (714) 961-1162

A Desktop Home For The Floppy of the '90s.

ProTégé Corporation

™ Protege Corporation Trademark

Medium Floppy disk
Pricing \$99.95
CONTACT: *Stac Electronics*, 5993 Avenida Encinas, Carlsbad, CA 92008, USA; Phone: 800-522-7822 or 619-431-7474; Fax: 619-431-0880.

Business & Financial

100/200LX

Altima Trading System 2.0

A portable option pricing and position management program that delivers values across a broad spectrum of securities. The program prices American and European style equity, index and commodity options. Can be used for executive or OTC options and some warrants. Position management includes all derivatives with breakdowns on a per security, month, line and summed line basis.

Altima utilizes models by Montgomery Investment Technology, Inc.

Pricing \$1,900
CONTACT: *Brownstone Productions Inc.*, 5 Paulmier Place, Jersey City, NJ 07302-3512, USA; Phone: 800-642-7116; Fax: 908-654-7108; Internet: brownst@panix.com.

100/200LX

Lane Bond Trader

Provides professionals access to the tools needed to calculate bond prices and yields, and manage portfolios.

Pricing \$399
CONTACT: *Lane Business Systems*, 87 Hibernia Ave., Rockaway, NJ 07866, USA; Phone 800-444-5263 or 201-586-9760; Fax: 201-586-0929.

100/200LX

Pocket-Consultant Business Programs

The following programs are available on a memo-card:

Bond Analysis \$219

Estimates the prices and yields of fixed income securities, and more.

Business

Pack 100 \$249

A collection of 100 programs for various business calculations, analysis, and formulas.

Investment

Partner \$699

Lets you evaluate and forecast the stock market, analyze options and bonds, perform technical and fundamental evaluation and tracking of mutual funds, track stock transactions, investments, bonds and indexes, plus perform 49 financial functions.

Investors

Accountant . . . \$699

Comprehensive system combining total portfolio management with investment analysis.

Market

Forecaster . . . \$369

Designed on a mainframe computer; the Market Forecaster predicts major market moves, both direction and magnitude of the stock market. Its data covers the past 25 years.

MarketWatch

PC Card \$189

Investment analysis software that lets you monitor and compare your investments. The program lets you compare many types of investments, get instant annualized yields of growth, distributions, total return and more.

MARKEX II

Plus \$499

Comprehensive mutual fund investment management and analysis system on a 10MB PC card. Lets you design your own expert timing system and provides you with a database of thousands of equity based mutual funds.

Portable

EZ-Biller Plus . \$599

Sales and inventory program that lets you track all your inventory, sales, accounts receivables, order entry, and more.

Portfolio

Analyzer \$299

Simplifies recording, managing, and analyzing your

assets for yourself, your business and each member of your family.

Sales and Inventory

Manager \$599

Provides timely access of sales and inventory data. The program handles complete order entry, tracking of salesmen performance, plus purchase history and more.

Stock Portfolio \$129

This program tracks stock transactions and offers a format for purchase date, number of shares, current price, current value, and current gain or loss. Also tabulates dividends, commissions, provides sales history and year end update report.

CONTACT: *Pocket-Consultant*, 7420 Unity Avenue North, Brooklyn Park, MN 55443, USA; Phone: 612-229-6260; Fax: 612-566-6727.

Games/Entertainment

95LX

ACE GAMEcard

Fourteen games are provided on a ROM card for the 95LX, including: Blackjack, Checkers, HP-tris, and Craps. Games selected from a "Windows" icon menu "popped up" from within built-in applications.

[See Advertising, page outside back cover.]

Runs under SysMgr . Yes

Pricing \$79

CONTACT: *ACE Technologies, Inc.*, 2880 Zanker Road, Suite 103, San Jose, CA 95134, USA; Phone: 800-825-9977 or 408-428-9722; Fax: 408-428-9721.

Health Care

100/200LX

Assurance Point-Of-Care

This product allows 100/200LX users to interface with other PC-based software systems from Data Med and is only useful

with those systems. The following Modules are available:

Runs under SysMgr Yes
Pricing for Assurance Point-of-Care Software with the following options:

Homecare System \$850

Long-Term Care

System \$850

Nursing System . \$850

Respiratory

System \$850

Rehabilitation

System \$850

CONTACT: *Data Med Clinical Support Services*, 2331 University Ave., SE, Minneapolis, MN 55414, USA; Phone: 800-STAT-911 or 612-378-2930; Fax: 612-378-2930.

100/200LX

Assurance Kinetics

This service assists pharmacists or physicians in calculating proper dosages and tracking dosing schedules of 20 commonly monitored drugs (gentamicin, theophylline, digoxin, etc.). Software programs contain the latest findings in pharmacokinetics research. Also includes 24-hour consulting service.

Runs under 100/200LX

SysMgr Yes

Pricing (software & training) \$1,850

CONTACT: *Data Med Clinical Support Services*, 2331 University Ave., SE, Minneapolis, MN 55414, USA; Phone: 800-STAT-911 or 612-378-2930; Fax: 612-378-2930.

95LX 100/200LX

Assurance Nutrition

This service provides precise enteral and parenteral nutritional analyses for pharmacists or dietitians. Includes software for analyzing and assessing patient data. Includes the latest findings in nutritional research and 24-hour consulting.

Runs under

100/200LX SysMgr . Yes

Pricing

Software & training \$1,850

CONTACT: *Data Med Clinical Support Services*, 2331

University Ave., SE, Minneapolis, MN 55414, USA; Phone: 800-STAT-911 or 612-378-2930; Fax: 612-378-2930.

100/200LX

Cardiac Risk-Consultant

A program designed for the cardiologist, cardiac surgeon, anesthesiologist, and the general internist. The Risk-Consultant is designed to establish the risk level for stroke and early mortality for open heart surgery. The model is accurate within 2% of the observed mortality within the observed data set if the cumulative mortality is less than 10%. The results are derived from 20 separate surgical groups over a 5 year period and are based on 60,000 surgical cases. It provides physicians with a preoperative risk prediction of mortality and stroke for patients who are candidates for six types of cardiac surgery. It's a useful decision making tool.

Price \$599

CONTACT: *Pocket-Consultant*, 7420 Unity Avenue North, Brooklyn Park, MN 55443, USA; Phone: 612-229-6260; Fax: 612-566-6727.

100/200LX

Clinical Calculations Manager & Pocket Drug Reference

Combines calculation management with a drug reference database for easy and fast access. Solves drug dosage and flow rate problems, unit conversions, critical care applications, and nutritional assessment. Provides complete drug database of description, side effects, precautions and additional useful information.

Pricing \$799

CONTACT: *Pocket-Consultant*, 7420 Unity Avenue North, Brooklyn Park, MN 55443, USA; Phone: 612-229-6260; Fax: 612-566-6727.

95LX 100/200LX

P*M*R: Physician's Medical Reference

P*M*R is an integrated reference system for medical professionals and pharmacists, consisting of a comprehensive drug reference (including information on drug interactions), a medical diagnosis and treatment reference, a full-screen medical calculator, laboratory test normal ranges and common medical abbreviations. Currently, two major databases are available for P*M*R: Lexi-Comp's *Drug Information Handbook* (with full reference information for over 4,000 drugs), and Dr.'s Griffith & Dambro's *The 5 Minute Clinical Consult* (a reference for the diagnosis and treatment of over 1,000 of the most common diseases).

The Lexi-Comp *Drug Information Handbook* contains up to 30 separate topics for each drug entry, including dosing, indication, contraindications, drug interactions, and pharmacology. In addition, you can store your own personal notes for each drug, and manage up to five separate formularies. Both the *Drug Information Handbook* and *The 5 Minute Clinical Consult* have been designed to operate as stand-alone references or as a seamlessly integrated reference (on the same PCMCIA card).

P*M*R was developed over a two year period in concert with the University of Arizona College of Medicine. Its interface includes pull-down menus and pop-up windows. In addition, P*M*R is System-Manager compliant, giving the user quick access to the HP Palmtop's built-in applications.

Runs under SysMgr . Yes
Pricing, PCMCIA card versions

Drug Information \$399
Clinical Consultant \$399

CONTACT: *Prolifix, Inc., 8809 Long Street, Lenexa, KS 66215, USA; Phone: 800-774-7357; Fax: 913-492-7396.*

100/200LX

PEPID: Emergency Physician Information Database

These 100/200LX .GDB databases provide diagnostic, pathophysiological, treatment and disposition information for emergent, urgent, and routine problems experienced in Emergency Departments. Page at a glance format allows rapid assimilation of data. Available as a complete database, or in individual sections, including the following:

■ **Pharmacology \$179**

A database of over 700 commonly prescribed drugs, including information on generic and trade names, adult and pediatric doses, dosage formulations and adjustments, wholesale costs, pregnancy class, contraindications, adverse drug reactions, important drug interactions, common overdose management, pharmacokinetics and other important information.

■ **General E.R. \$229**

Includes information on all emergent and urgent problems in the fields of neurology, psychiatry, dentistry, ophthalmology, ENT, cardiovascular, pulmonary, gastrointestinal, genitourinary, obstetrics/gynecology, infectious disease, rheumatology, allergy, environmental medicine, dermatology trauma, and medicolegal.

■ **Critical Care \$149**

A special database with parts of the Pharmacology, General E.R., and Toxicology database, plus the complete Trauma database.

■ **Orthopedics . \$89**

Includes the essentials on diagnosis and management of fractures, sprains, ligament and joint injuries and infections. Also includes orthopedic procedures such as joint aspiration, reduction of dislocations, splinting and casting.

■ **Pediatrics . . . \$89**

Database of essential emergency and primary care information for Pediatric problems, including information on neonate to teenager, growth and development, diseases and emergency resuscitation.

■ **Toxicology . . \$89**

Database of information on overdose management, antidotes, drugs of abuse, occupational exposures, plant identification/poisonings, general toxins, list U.S. Poison Control Centers.

■ **Trauma \$89**

Includes information on resuscitation basics and the management of traumatic emergencies, plus a step-by-step guide to procedures.

These databases are optionally available on a Flash RAM card, allowing you to add or delete information.

Pricing see above

Complete set

on floppy \$425

On Flash card add 25%

CONTACT: *PEPID Inc., 100 Greenwood Ave., Evanston, IL 60201, USA; Phone: 708-475-0778; Fax: 708-475-0779; Voice mail: 800-329-7872, ext. PEPID (73743).*

95LX 100/200LX

Personal Food Analyst

Helps you track, analyze and modify your eating habits. Create your nutritional profile based on your age, height, activity level, sex and desired weight. Records what you eat during the day and recalculates how many calories (and nutrients) you have remaining.

Personal Food Analyst uses a database of 5,000 food items to analyze what you eat. It lets you preview food for nutritional content before you eat and analyzes food for 29 different nutrients, including calories, protein, fats, carbohydrates, and cholesterol. Comes in consumer version available on ROM card. A more sophisticated professional version available on floppy disk for \$289.

Pricing

PFA Consumer . . \$149
CONTACT: *Mirical Nutrition Corp, 4606 Northpark Drive, Colorado Springs, CO 80918, USA; Phone: 800-732-7707 or 719-598-5276; Fax: 719-598-5790.*

95LX 100/200LX

Pocket RD II: nutrition software

This software for nutrition, health and fitness professionals calculates, sorts, organizes, and graphs clinically relevant data, and prints client and personal reports. It includes 12 program sections: Weight loss, exercise analysis, body composition, nutrient analysis with more than 5,000 foods, diabetic and renal calculations, enteral and parenteral nutrition, and many equations on determining appropriate nutrient intake levels.

Pricing \$499

(Floppy disk version, \$279)

CONTACT: *Poly-Bytes, Inc., P.O. Box 770070, Coral Springs, FL 33077-0070, USA; Phone: 305-485-4600; Fax: 305-485-0022.*

100/200LX

Portable Nurse Works System

This PCMCIA based software program solves drug dosage and flow rate problems. Options are selected from single menu. Instructions are provided at the bottom of each screen.

Pricing \$499

CONTACT: *Pocket-Consultant, 7420 Unity Avenue North, Brooklyn Park, MN 55443, USA; Phone: 612-229-6260; Fax: 612-566-6727.*

Language Translation

100/200LX

Transparent Language™ PC Cards

Lets you read real literature in the original language. Fifteen collections contain over 67 titles in Spanish, French, Italian, Latin & German.

Pricing \$179

CONTACT: *Pocket Consultant, 7420 Unity Avenue North, Brooklyn Park, MN 55443, USA; Phone: 612-229-6260; Fax: 612-566-6727.*

95LX 100/200LX

Globalink Foreign Language Translation

The Globalink Translation Systems gives sentence-by-sentence translations with results given in the grammatical structure of the target Language. According to the manufacturer, the product gives translation quality which is equivalent to that obtained from sophisticated desktop or mainframe systems. Load a 5-10 page file and have it translated. Language output can be post-edited one sentence at a time, or after an entire file has been translated.

Spanish/English, French/English, and German/English versions are available.

Pricing \$79.95
(Buy two cards, get third language free.)

COMPANY: *Globalink, 9302 Lee Highway, Fairfax, VA 22031, USA; Phone: 800-255-5660 or 703-273-5600; Fax: 703-273-3866.*

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Miscellaneous

100/200LX

Misc Programs on PCMCIA Cards

The following programs are available on PCMCIA card, for the HP 100/200LX, OmniBook, or most PCMCIA systems.

TarotMaster . . . \$79

All 78 cards included along with their basic interpretations, names, symbols.

StampBase . . . \$169

Database to catalogue your stamps, including catalog number, description, type, condition, quan-

tity, denomination, year, country, purchase date, cost, and more.

CoinBase . . . \$169

Database to catalog your coins, including standard coin number, description, denomination and year.

AlgeTutor \$79

Learn algebra, all major topics covered.

GeomeTutor . . . \$79

Learn geometry, all major topics covered.

ChemCalc \$79

Intro to chemistry.

AstroTutor \$99

Intro to astronomy.

Eclipse Master . \$79

Computes solar and lunar eclipses, all aspects of calculations included.

FinancialSuper \$119

PCMCIA PRODUCTS

Toolbox of 49 of the most needed financial functions. **FundWatch ... \$169** Track and evaluate mutual funds. Includes analytical graphs, charts price, performance, and more.

Market Strategist ... \$599 Integrated program/database for developing and back-testing stock market trading strategies.

Bearings ... \$79 Program for pilots, skippers, radio amateurs or anyone needing to know precise bearings or great circle directions from one location to another.

Construction Estimator ... \$329 Stores materials prices, runs totals, improves accuracy and cuts estimating time.

DietHelper ... \$169 Tracks intake of calories, sodium, cholesterol, fiber, and 20 other variables.

Finance ... \$89 Learn and do basic financial analysis, mortgages, loan analysis, bond analysis, compound interest, and more.

GraphMaster ... \$99 Create bar/line, pie, scatter and text charts or graphs. Make simple or complex charts with overlays of several types of information. Also plots math functions.

Gravitor ... \$89 Calculates the gravitational forces on astronomical bodies such as stars and planets and determines their orbits; paths are plotted.

Home Inventory \$129 Lets you keep records of possessions, credit cards and important papers. Multiple files can be kept, for home and for business.

Inventory Express ... \$299 Item master database stores over 15 fields of information. Enter orders, receipts, and issues while program tracks changes. Flexible reporting lets you see the data you want. Export to word processing or spreadsheet.

PalmReader ... \$79 Record hand measure-

ment data and "reads" your palm.

PhysiCalc ... \$79 Reviews the major areas of mechanics, gravity, light, quantum mechanics, and relativity. Includes 30 key equations, and more.

RentalManager \$189 Easy entry of data; provides detailed information on your rental properties.

RuneMaster ... \$79 Explore "17171 the secrets of the Runes.

Electrical Engineering .. \$259 10 programs for plotting, analyzing, conversions, simulations and more.

Bridge Master \$199 Comprehensive program.

Blackjack Coach \$149 Learn and practice getting advice and consent, test playing and betting strategies.

Cribbage 2.0 .. \$89 Classic two-handed version.

Backgammon . \$139 Test skills and improve your game, play computer or another player.

HoroScopics

Combo ... \$169 Three programs for predicting the future: **HoroScopics II** — an easy-to-use astrology program; **TarotMaster** — a fortune telling program; **RuneMaster** — a divination program using Nordic runes.

Probaloto ... \$169 Incorporates a mathematical formula to weigh the lottery numbers previously chosen, either positively or negatively, from a data file that is automatically updated as you play.

Lotto Master ... \$199 Track winning numbers & analyze them for projecting the future, customized for any state.

Hansen-Predict \$349 Self learning, general purpose Expert System, predict future outcomes.

Options Analysis ... \$199 Complete analysis for Put & Call prices, writing, values, spreads/straddles, and more.

Active Circuit Analysis ... \$399 Active and passive, ex-

ceptional features for extensive circuit analysis. **Filter Analysis \$199** Calculate the effective attenuation of an electrical filter composed of passive elements.

Trig Expert ... \$119 Define the geometry of the problem, program figures everything else.

Teacher's Gradebook ... \$179 Store, retrieve, summarize, update, manipulate/rosters, grades, & more.

CONTACT: *Packet-Consultant, 7420 Unity Avenue North, Brooklyn Park, MN 55443, USA; Phone: 612-229-6260; Fax: 612-566-6727.*

Project Management

100/200LX

Project: VISION and PlanMan

These two programs follow classical project planning techniques and feature Critical Path Method activity logic flow charts and Gantt Timeline bar charts combined with Resource Use bar charts. They also allow you to do the following:

- Calculate manpower and material usage/costs throughout a project and over multiple projects;

- Adjust master schedules, allowing for resource, budget or time limitations;

- Track the project as it progresses and compare it with your original plan, allowing you to effect changes according to reality;

- Make changes with just a few keystrokes.

Project:VISION and PlanMan are DOS based programs that can run on an PC compatible computer with CGA or VGA graphics, including the HP 100/200LX. They both feature variable magnification on network and timeline screens, multiple logic links between activities, attachable memos, and a worksheet area that can

hold up to 9,900 activities for planning multiple projects. Project:VISION can handle up to 1,000 activities per project. PlanMan can handle up to 75 activities.

Pricing (plus cost of PCMCIA card)

Project:VISION ... \$499
PlanMan ... \$99
CONTACT: *Inmax Publishing Limited, 2673 Terrace Avenue, North Vancouver, BC, CANADA, V7R 1B5; Phone: 604-980-9991; Fax: 604-985-5597.*

Real Estate

100/200LX

RealSearch

RealSearch processes captured multiple listing and tax roll data, converts it to a DBF for fast searches by street, area or MLS number. Enter desired street, select number with lightbar, touch enter and 42 fields of information appear. Scroll up, down or search for another. With compression a 5MB RAM PCMCIA card can hold up to 10,000 records! Can process captured text from other sources. Includes runtime FOXPRO 2.6 and REASSIST, a data extraction utility.

Pricing
On 5MB card ... \$799
Floppy disk ... \$299
Setup ... \$155
(Setup loads your data into program format.)

CONTACT: *BIDS Data Service, Inc., 3714 Horatio Street, Tampa, FL 33609, USA; Phone: 813-839-3646; Fax: 813-839-3003; BBS: 813-835-1963.*

Specialized

100/200LX

The Bible

Comes with QuickVerse 2.0 and concordance on PC card. Your choice of translations; complete King James, New King James, Revised Standard, New Revised Standard, New Century, Living Bible, and New International. Locate word/phrase in just seconds with QuickVerse.

A Hebrew & Greek translation option is also available.

Pricing
Bible ... \$599
Translated Bible ... \$899

CONTACT: *Packet-Consultant, 7420 Unity Avenue North, Brooklyn Park, MN 55443, USA; Phone: 612-229-6260; Fax: 612-566-6727.*

Word Processing

Dictionary/Thesaurus card

HP offers a Dictionary/Thesaurus ROM card for the 95/100/200LX.

Product No. HP F10005A
Runs under System Manager ... Yes
Pricing ... \$149.95

CONTACT: *Hewlett-Packard dealers world wide and selected third-party vendors.*

Publications and Services

95LX 100/200LX

This section focuses on PCMCIA-related publications and services.

95LX 100/200LX

IC Card Systems & Design

This bi-monthly publication focuses on PC card (PCMCIA) issues and technology. The subscription base is comprised of 20,000 design engineers, system integrators, distributors and resellers of PC card products.

Pricing U.S. ... \$29
International ... \$50.00
(Payment in U.S. funds must accompany order)

CONTACT: *IC Card Systems & Design, Attn: Subscription Department, 6151 Powers Ferry Rd., Atlanta, GA 30339, USA; Phone: 404-955-2500; Fax: 404-955-0400.*

95LX 100/200LX

PCMCIA; News Update; Bulletin Board
PCMCIA stands for Personal Computer Memory Card Association. This

association has defined and published standards for PC cards.

They publish *PCMCIA News Update* quarterly, containing news regarding the PCMCIA standards progress along with product announcements and other related information.

PCMCIA also maintains a *Bulletin Board* that provides information on upcoming events, technical issues and general information to members. Non-members are provided a one-time access free of charge (see BBS numbers below).

Pricing ... Free
(Fax requests to PCMCIA, include complete address including company name, etc.)

CONTACT: *PCMCIA Headquarters, 1030 East Duane Avenue, Suite G, Sunnyvale, CA 94086, USA; Phone: 408-720-0107; Fax: 408-720-9417; BBS1 (2400 baud): 408-720-9388; BBS2 (9600 baud): 408-720-9386.*

95LX 100/200LX

The PCMCIA Developer's Guide

This reference book published by Sycard Technologies, contains over 400 pages covering information on the development of PCMCIA-related products. Includes chapters on PC Card Standards, Designing Host Adapters, Designing PC Card Peripherals, PCMCIA Software Requirements, The Future of PCMCIA, PC Card Products, and a very complete Product and Services Directory for developers and PCMCIA users.

The book's appendixes diagram and describe Connectors, Card Services Functions, and Socket Services Functions. They also include a Glossary, Sample Schematics, PCIC Register List, Index, and a section on where you can get more information on PCMCIA cards and their development.

Pricing ... \$89.95
CONTACT: *Sycard Technology, 1180-F Miraloma Way, Sunnyvale, CA 94086, USA; Phone: 408-749-0130; Fax: 408-749-1323.*

PCMCIA Glossary

ATA

Mass storage flash cards produced by SunDisk and IBM are called "ATA Flash disks" because they conform to the PCMCIA ATA standard. This standard was created to allow the development of PCMCIA card "mass storage devices" (high capacity flash cards) that "looked" like a hard drive to the IBM AT (286 or greater) computer using them. The SunDisk ATA Flash Disk is an example of a solid state ATA device. The HP OmniBook hard drive is an example of a rotating ATA device.

Card Drives

Devices similar to floppy disk drives that can be installed in, or attached to desktop PCs and MACs, allowing those computers to access PCMCIA cards (see article, page 15).

Card & Socket Services

These PCMCIA specifications provide PC Card software and hardware developers a common standard, allowing them to develop cards that work in a variety of computers.

Card Services Release 2.0 and Socket Services Release 2.0 are the specifications for the PCMCIA software architecture. Socket Services is a BIOS level software interface that provides a method for accessing the PCMCIA slots of a computer. Card Services is a software management interface that allows the allocation of system resources (such as memory and interrupts) automatically once the Socket Services detects that a PC Card has been inserted.

File Compression Software

Software that compresses files stored on any medium, including PCMCIA memory cards. Compression software can effectively double the rated capacity of a PCMCIA memory card.

Flash-Random-Addressable (Flash RAM) Cards

Flash RAM cards (a.k.a. "Flash Cards" or "Flash Disks") are comprised of computer chips that can be written to and read from. They are different from SRAM cards in that they do not need a battery to retain data and they are available in larger capacities (up to 40MB currently for the HP Palmtops).

I/O Cards

Input/Output cards were made possible by PCMCIA releases 2.0 and 2.01. Examples of I/O cards include fax/modem cards, ATA flash disks and drives, wireless messaging cards, and LAN cards.

JEIDA

The Japanese Electronic Industry Development Association is the organization in Japan responsible for PC Card standards. JEIDA and PCMCIA cooperate closely. JEIDA Release 4.0 is identical to PCMCIA 1.0 and JEIDA 4.1 is identical to PCMCIA 2.0.

PC Card

A peripheral device that can add a variety of capabilities to computers including: memory, mass-storage, LAN, fax/modem and wireless communications. The PCMCIA PC Card is roughly the dimensions of a credit card and has a standardized 68 pin connector at one end. There are three card types (see Type I, II, & III cards below).

The PC Card logo is copyrighted by PCMCIA. Use of the logo indicates that the manufacturer is a PCMCIA member in good standing and the memory or I/O card is compatible with the PCMCIA PC Card Standard.

PCMCIA

The Personal Computer Memory Card International Association is a non-profit trade association and standards body comprised of over 500 member companies that defines the industry standard for the PC Card

technology. PCMCIA also promotes compatibility among PC Cards and PC Card-based systems.

PCMCIA Standards

The complete set of all of the PCMCIA PC Card Standards. The current standards (Sept 94) include the PC Card Standard Release 2.01, Socket Services Specification Release 2.0, Card Services Specification Release 2.0, ATA Specifications Release 1.01, AIMS Specification Release 1.0, and the Recommended Extensions Release 1.0.

PCMCIA Standards, releases 1.0, 2.0, & 2.01 and 2.1

Current and past PCMCIA releases that define the specifications and capabilities of a card. All PCMCIA standards are backward compatible (e.g. a SRAM card developed under the 1.0 standards will work in a memory card drive developed under the 2.01 standards).

Release 1.0, issued in September, 1990, specified a PC Card offering memory capabilities for mobile computing. The SRAM cards used by the 95LX (and subsequent HP Palmtops) were developed under this standard.

Release 2.0, issued in September, 1991, broadens the first specification with the addition of input/output and execute in place capabilities, allowing for the SunDisk ATA mass storage cards, fax/modem cards and wireless communications devices to be developed for the HP 100/200LX.

Release 2.01, issued in November, 1992, is a minor correction of Release 2.0.

Release 2.1, issued in July of 1993, made some additional minor modifications to Release 2.0.

PC

Abbreviation for Personal Computer. It is often used to refer to an 80x86 DOS-based computer system.

SRAM / RAM Cards

Static-Random-Addressable memory cards. These cards come in capacities up to 2MB (4MB with file compression software). The files on the card are retained by a small lithium backup battery, which must be replaced every 10 months or so.

ROM Cards

Read-Only-Memory cards, which come in varying capacities. The data or programs on these cards can only be read by the host computer, they cannot be written to. The HP Dictionary/Thesaurus Card is an example of a ROM card.

Type I, II, and III Cards

PCMCIA has defined three PC Card types. All have the same length, width, and are 3.3mm thick along their edges and connector ends so they can be inserted into standard PCMCIA slots.

Type I is a constant 3.3mm thick overall and is commonly used for memory cards, like the SRAM cards useable in all the HP Palmtops.

Type II is 5mm thick to accommodate applications that require more room for components such as fax/modem cards used in the 100/200LX.

Type III is 10.5mm thick to accommodate higher functionality devices such as rotating storage media (hard disks) and wireless communication devices. These devices are not useable in the HP Palmtops.

Type I & II Extended cards are PCMCIA recommended extensions that are identical to the regular cards with the exception of their length. They are 50mm longer than regular cards, allowing the development of applications that need components outside of the system (like wireless messaging cards used with the HP 100/200LX) or for applications that need more internal room for components.

HOW TO CONTACT US

There are a number of ways to get in touch with *The HP Palmtop Paper* staff. You can write; mail us a disk with your comments; send CompuServe mail; fax; or call. Our mailing address and contact information is:

Thaddeus Computing, Inc.,
P.O. Box 869 or 57 E. Broadway,
Fairfield, IA 52556, U.S.A.
Phone: 515-472-6330 or 800-373-6114;
Fax #: 515-472-1879;
CIS ID: Hal Goldstein, [75300,2443]
Internet: 75300.2443@compuserve.com

To advertise in *The HP Palmtop Paper*, contact Brian Teitzman or Margaret Martin.

To subscribe, change address, or clear up any problem with your subscription, contact our subscription department (Director Sharon Dilmore).

Technical Support

HP Technical Support — HP offers these options:

- **FREE TECHNICAL SUPPORT**— is offered to all Palmtop users and is available by calling 503-757-2004.
- **FREE AUTOMATED SUPPORT**— is offered 24 hours a day by calling 800-443-1254.
- **REQUEST FAXED OR MAILED INFORMATION** — 800-752-0900.

On-Line Support — offered by these bulletin board services.

■ **COMPUSERVE: GO HPHAND FORUM** - Call 800-848-8199 or 614-457-0802; For FREE membership state #231.

■ **AMERICA ON LINE:** Keyword PALMTOP - Call 800-227-6364 or 703-893-6288 for membership information.

■ **INTERNET:** comp.sys.palmtops (best); comp.sys.handhelds; or eddie.mit.ed.

How to submit an article

The richness of *The HP Palmtop Paper* comes from the contributions of Palmtop PC users. We and your fellow users welcome your submissions. (We do not offer payment for articles; your reward is knowing that you've helped others.)

If you have a good idea and want to "go for it," send it in via CompuServe E-Mail [75300,2443], Internet: 75300.2443@compuserve.com, or send disk or hard copy to Hal Goldstein or Rich Hall at the above address. Alternatively you can send an outline of your idea. We will try to guide you as to when and whether we would use the article and contact you if we need clarification or have any suggestions. We may want to use an article but for a variety of reasons you may not see it for many months. Please understand that we cannot promise to run any particular article.

If you can, especially if you write a Palmtop Profile, send us a black and white photo of yourself.

Products advertised in The HP Palmtop Paper PCMCIA Review

Company	Product [Phone/Fax numbers]	Page number
ACCURITE	(External Disk Drive) [408-433-1980; Fax: 408-433-1716]..9	
ACE	(ACE Double Card) [800-825-9977; Fax:408-734-3344]..back cover	
ACMA	(Impression CardDrive) [510-623-1212; Fax: 510-623-0818]..39	
AMP	(Flash memory card) [800-488-8459]..41	
Aware Electronics	(Geiger Counter) [Phone/Fax: 302-655-3800]..46	
Brownstone	(Trading Software) [800-642-7116; Tel/Fax: 908-654-7108]..23	
ComputerBoards	(Data Acquisition) [508-261-1123; Fax: 508-261-1094]..19	
CSS	(Barcode System) [800-733-5017; Fax: 503-752-7037]..22	
Dana Design	(Solar Pouch Rechargeable Battery) [406-587-4188; Fax: 406-585-9284]..44	
Databook	(Memory Card Drive) [716-889-4204; Fax: 716-889-2593]..40	
E & B	(Leather Cases) [800-896-2273; Int'l: 916-344-5047; Fax: 916-782-9306]..1	
EduCALC	(Accessories Catalog) [800-677-7001 (ext. 108); Fax: 714-582-1445]..32	
EM Alternatives	(Palmtop/Palmpeds Medical Software) [800-258-2550; Fax: 414-241-8514]..31	
Envoy Data	(PCMCIA Products) [602-892-0954; Fax: 602-892-0029]..33	
Epson	(PCMCIA Flash, Ram, Modem) [800-374-7300]..26	
	(PCMCIA Flash, Ram, Modem) [800-374-7300]..27	
EXP Computer	(ThinFax Modem) [800-EXP-NYCA; Fax: 714-453-1319]..inside back cover	
Extended Systems	(JetEye, Infrared Printer Interface) [800-235-7576; Fax: 406-587-9170]..16	
	(Infrared PC Interface) [800-235-7576; Fax: 406-587-9170]..26	
Greenwich Instruments	(Palm Link-a-Printer) [800-476-4070, 704-376-1021; Fax: 704-335-8707]..12	
Greystone	(Universal Card Drive) [408-866-4739; Fax: 408-866-8328]..28	
Hewlett Packard	(StarLink) [800-917 LINK]..25	
InMax	(Vision CGA Graphics Pack) [604-980-9991; Fax: 604-985-5597]..30	
Maxtor	(PCMCIA Flash Cards) [800-EGGHEAD, 800-4MAXTOR]..24	
Mobile Media	(MobileMate) [800-562-2830]..21	
Opus 63	(Palmtop Liberator (holster)) [718-706-6787; Fax: 718-706-7034]..43	
Peripherals Direct	(Flash Card Reader/Writer Bundle) [800-724-3000]..9	
Portable Solutions	(T-Shirt) [800-700-1189]..49	
Prolifix	(Physician's Medical Reference) [800-774-7357; Fax: 913-492-7396]..13	
Prolinear	(PCMCIA Memory, Modems) [800-759-0881 or 818-821-1881; Fax: 818-821-1879]..10	
Protege	(PCMCIA ATA Reader/Writer Card Drive) [800-995-4453; Fax: 714-961-1162]..47	
RadioMail	(Internet) [800-909-0260 (Dept. HP) or 415-286-7800; Fax: 415-286-7805]..34,35	
SCM Microsystems	(Desk Card Reader) [U.S. 408-395-9292; Fax: 408-395-8782; Germany: 4989 859 8702]..5	
	Contact [U.S. 408-395-9292; Fax: 408-395-8782; Germany: 4989 859 8702]..5	
Seagate	(PCMCIA Flashcards) [408-438-8111;]..17	
Smart Modular	(SmartCard:Fax/Modem/Memory) [800-536-1231]..inside front cover	
Steele Creek Tech.	(Card-link Drives) [Phone & Fax: 704-588-1780]..12	
Thaddeus Computing	(HP Palmtop Paper) [800-373-6114; Fax: 515-472-1879]..8	
	(HP Palmtop Paper ON DISK) [800-373-6114; Fax: 515-472-1879]..45	

Software mentioned in The HP Palmtop Paper PCMCIA Review and included in past issues of The HP Palmtop Paper On Disk or the Subscriber PowerDisks

NOTE: PCMCIA.ZIP, the text file for *The HP Palmtop Paper PCMCIA Review*, will be found in the September/October 94 issue of *The HP Palmtop Paper ON DISK*.

Product	Function	CIS forum	Type	Page
100BUDDY.ZIP	(Best Palmtop Tips) Adds useful features to the 100LX	HPHAND/11	Share	7,13
95BUDDY.EXE	(93 Subscribers PowerDisk) Adds features to 95LX	HPHAND/7	Share	7,13
ACCIS9.ZIP	(BestTips 94) Automates CompuServe access	HPHAND/5	Share	37
DIET.ZIP	(N/D 93) Compression software	na	Free	7,14,20,21
DIET145F.ZIP	(BestTips 94) Newer ver. of DIET compression program	Internet	Free	7,14,20,21
LHA213LX.EXE	(93 Subscribers PowerDisk) Compression software	HPHAND/1	Free	22
NOTEPAD.ZIP	(BestTips 94) Note taker that links the 95LX PHONE/APPT applications	HPHAND/7	Share	14
PKL103.ZIP	(J/F 92) Compression program for .COM and .EXE files	HPHAND/1	Share	22
PK203G.EXE	(M/A 94) PKZIP/UNZIP 2.04g, an archive utility	HPHAND/1	Share	22
SSFAX5.ZIP	(M/J 94) Ver. 5.0 faxer for 95LX & 100LX	HPHAND/9	Share	37,47
TIMOUT.ZIP	(M/A 92) Change auto shutoff time on 95LX	HPHAND/6	Free	7,13
ZIP163LX.EXE	(93 PowerDisk) File transfer program	HPHAND/5	Free	16
ZIP171.ZIP	(Best Palmtop Tips) Ver. 1.71 file transfer program	HPHAND/5	Free	16

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- ◆ MODEM - 2400bps.
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- ◆ View received faxes (up to 7 pages).
- ◆ Send up to 10 pages.
- ◆ Automatically converts ASCII files to fax format before sending.
- ◆ Interfaces with HP integrated phone book for frequently used numbers.
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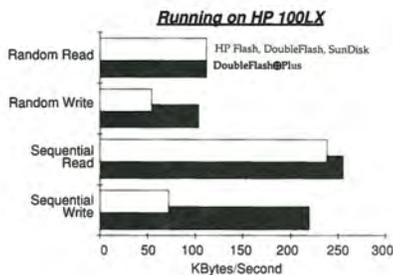
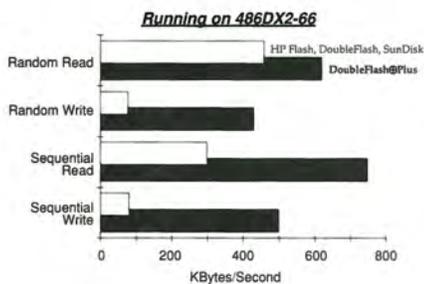
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Features

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- ✓ 50% to 400% Faster than Standard ATA Flash Cards
- ✓ Plug-&-Play Installation
- ✓ Built-in Battery Management Supports NiCd, NiMH, Alkaline & Lithium batteries
- ✓ HP Palmtop Optimized Driver
- ✓ Optional ROM Installation Card
- ✓ Five Year Warranty

Specifications:

PCMCIA: Type I and II
 Voltage: 5V, +/- 5%
 Power modes: High, Med, Low
 Reliability: 300,000 hrs MTBF
 < 1 in 10e14 bits
 Shock: 1,000 G