

THE HP Palmtop Paper

U.S. \$7.95

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Publisher's Message



In an industry of constant change, our HP Palmtop platform stays the same. Yes, we can add more memory, double the speed, and add a variety of software and accessories. Still, fundamentally the HP DOS Palmtop has not changed since the 100LX was introduced 6 years ago in May 1993. (The 1995 HP 200LX added a few usability features and changed the color of the case, but basically it is the same machine.)

I know some would like backlighting and a color screen (without a loss in battery life) and a faster processor. Synchronization with Windows applications would be appreciated. However, the 200LX remains an incredibly durable, flexible, and practical tool for our daily handheld activities.

The stability of the HP palmtop platform gives us the luxury of exploring its nooks and crannies yielding surprisingly useful results. Ed Keefe, editor of the HP Palmtop Paper, has been given carte blanche to dig up hidden treasures. His in depth discussions of the data base applications (phone, notetaker, database) bring more possibilities to already useful applications both for casual and power users.

We have discussed a number of times how to view great literature on the palmtop. In this issue, you will learn how to view great art on the palmtop. Read Gene Dorr's tutorial on porting graphics files to the palmtop for great topcards.

Regular columnist David Sargeant, well known in the palmtop community thanks to his www.hplx.net web site, profiles himself. Engineer, father of two, and webmaster, David describes his creative uses of his palmtop in his role as a full time student. Finally, those with many files on a PC card or on a memory-upgraded palmtop will want to read about Magellan. This powerful file manager, once a several hundred-dollar product, and one of my favorites, is now free.

The good news is that although HP will not market or improve the HP 200LX, all indications are that it will continue to sell it. Based on the number of upgrades we do and the continued support and enthusiasm of users, I would not be surprised if the HP 200LX is not around for another six years.

Ed Keefe claims that the HP Palmtop is the computer equivalent of the venerable HP 41C programmable calculator. The HP 41C held its place in the market for ten years and is still the calculator of choice for many professionals.

Hal Goldstein

The HP Palmtop Paper

Increasing Your Personal
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News!

News and New Products

Over the past couple of months we've received at least thirty requests from HP Palmtop users asking if there's a way to synchronize the Palmtop's Appointment Book, ToDo List, Phonebook, and NoteTaker with Microsoft's Outlook.

We wish that we had the answer to this oft-repeated request but, as of now, we do not.

We've looked at the problem of synchronizing the two different programs and have tried coaxing veteran Palmtop programmers to solve the problem.

The best that has been done, so far, is a one-way conversion of Outlook's Calendar to the HP Appointment Book via MS Excel and the Intellisynch program from Puma. A second attempt at transferring files is also available but purportedly only works for the HP 100LX. These interim solutions may be found at www.PalmtopPaper.com/download.htm. Just type 'outlook' in the search box and click Fetch!. Download APPTMAKR and OUTLOOK.

Apparently no one has attempted to synchronize Outlook's Contacts and Journal applications with the HP Palmtop's Phonebook and NoteTaker.

If anyone solves this problem, please send e-mail to Hal Goldstein (hal@thaddeus.com).

Y2K and cc:Mail

In the Sep/Oct issue of *The HP Palmtop Paper*, we mentioned that Lotus Development Corp. had declared that its cc:Mail program was not Y2K compliant. We took this declaration at face value.

Subsequent investigations, most notably those by Martin Paul, have convinced us that our acceptance of the Lotus statement was unjustified.

Martin Paul who runs the palmtop.com email service has demonstrated that cc:Mail is just as Y2K compliant as any of the other System Manager programs in the HP Palmtop. The program will not always display a four digit year but it will deal with

information that contains dates for 2000 and beyond. It will sort information by date and correctly time-stamps all cc:Mail messages.

This means that ALL of the built-in functions of the HP Palmtop are indeed Y2K compliant. Enough said!

(One of my new millennium resolutions will be not to believe everything I read from Lotus Development Corp.)

Meal Master Is Now "Giveaware"

Meal Master (v.8.06f) a well-known, database program for recipe-collectors is now being offered as copyrighted freeware by its parent company, Episoft.

The announcement came to our attention about a week too late to make it onto the 1999 CD InfoBase from Thaddeus Computing, Inc. However we have included a copy of the MM806f database program on this issue's *The HP Palmtop Paper ON DISK* and on our Web site at www.PalmtopPaper.com/downloads.htm. Just enter Meal Master in the search box and click Fetch!. An older, shareware version, 7.02, is available on the 1999 CD InfoBase and from our Web site. The originating site for MM806 is <http://home1.gte.net>. That site has links to several other sites with thousands of recipes for the Meal Master program.

It would be great if the recipes could be converted from Meal Master format to the database format of the HP Palmtop. So far, no one has tried doing this but don't let that prevent you from giving it your best shot.

Framework and the HP Palmtop

In the days when "integrated software" was popular, Ashton-Tate, the company that produced dBASE, also marketed Framework, a suite of programs that knitted together a word processor, outliner, telecommunication, spreadsheet, database, graphics program, personal information manager and the FRED programming language.

Ashton-Tate was later acquired by Borland International

Selections & Functions, Inc. has taken

over the development of Framework and has versions of the program that will run under Windows 95/98 as well as a version that will run on DOS palmtop computers

Framework V LX is a special version of Framework which can run on the HP Palmtop. The program suite will not run under System Manager. It requires either a separate Software Carousel, DOS session or you must exit System Manager altogether with the More MENU Application Terminate command. Framework is best run on a double-speed Palmtop. Its performance on a standard Palmtop may be unsatisfyingly slow.

Framework V LX is delivered together with Framework V on a CD-ROM. The dual license to use Framework V on a desktop computer and Framework V LX on the HP Palmtop means that you can have the same programs and data files on both machines. The LX version of Framework features Nettamer as its Internet browser and email manager.

For more details, visit the Framework Web site at www.fred.com/

For pricing and availability of Framework, please contact Selections & Functions, Inc. at (781)545-3327.

In Passing

We note, in passing, that the Compuserve HPHAND forum converted from ASCII to HMI transactions on or about Feb 10, 1999. There was some hint that this would happen eventually but the actual changeover was without any alert to long time users of the forum.

If you access the forum with a Windows based program, e.g., WinCim, you should not have noticed any difference.

Palmtop users can use acCIS 4.0. Earlier versions of acCIS don't support HMI (www.rundel-d.com).



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Manage Your Files With Magellan

A longtime user of the Magellan file manager/file viewer shares his insights into the program's unique features.

by John B. Hickman

With the disk capacities of an HP Palmtop being enhanced to 8,16, 32 or 64 megabytes, file management has become an increasing problem.

Filer, HP's built-in file management program, is excellent for navigating and even finding files on a well-organized Palmtop. However, my HP 200LX has never been that well organized and I doubt that it ever can be. It currently has over 1000 files spread over more than 50 directories and subdirectories on two physical disks.

With all that stuff, how can I find older files and eliminate unneeded ones? After all, the purpose of keeping old files is the probability that they will be useful later on for some purpose. Eventually, however, there comes a time to purge useless files. Whether you're looking for a file to use it or purge it, the first problem is to find it.

Running Magellan

My solution is to install Magellan 2.0 on my HP. I have owned a registered copy since the early 1990's when Lotus introduced the program. Fortunately, for HP owners, Lotus has placed the program in the public domain so anyone may have a copy.

Magellan is too big to run under System Manager. This means I have to

press More MENU Application Terminate every time I want to use the program. However, being able to fire up Magellan is worth this small hassle. Since I've installed Software Carousel, Magellan is always loaded on my HP and it is just a hot-key away at any time in its own DOS session.

Here are some of the tasks Magellan will do:

File Management

Magellan is primarily a file management program. It has files called "viewers" that permit viewing many kinds of files without executing the programs that run them. One can even cut text from a viewed file and either print or paste that text to a file.

Macro Language

Magellan has a simple macro language that lets users streamline repetitive tasks. Any combination of keystrokes can be combined into a macro. By including "Program Launch" in a macro, the possibilities are immense. The macro facility makes it easy to customize the program to suit your needs.

Exploring Directories

Magellan offers a very powerful Explore feature that slices through complicated directory structures to present carefully tailored subsets of your files for viewing, moving, deleting and even editing. The subset of file names appears on the screen regardless of the directories in which the files reside. This way, related files may be grouped together without disturbing their actual locations on any disk. The directories are, of course, clearly identified.

Archiving Using PKzip 1.1

Archiving files using PKzip is a very simple task. Simply shake out a set of files that may need archiving. Then highlight the ones to be archived. A couple of keystrokes later, the files are compressed to a *.ZIP file with a name of your choosing. Once zipped this way, it is easy to view those files again without unzipping. Just highlight the zipped file and a list of its contents will appear. Then highlight a file of interest, and immediately, its contents are displayed on



ABOUT THE AUTHOR

John B. Hickman (jbh@wph.com) is Chairman and CEO of the W. P. Hickman Company, a manufacturer headquartered in Asheville, North Carolina. Mr. Hickman holds a Master's Degree in Engineering from the University of Michigan. He has been a computer hacker since 1958 and owner of an HP Palmtop since 1991.

the screen. Unfortunately, the built-in MGzip is an early version that won't read or unzip files zipped by the current Version 2.04g of PKzip.

File Viewers

Magellan examines both the file extension and the file's structure to decide what kind of file it is. Then it selects an appropriate viewer for displaying that file. There's an override to change the viewer if the wrong one is selected. One of the viewers is actually a crude text editor that can be used to edit or create files. On the HP Palmtop, the simple text viewer will let you peek inside Database, Phonebook and Appointment Book files. The files won't look like they do normally but text information will be there to read.

File Cleanup

Magellan simplifies cleaning up a disk full of files. After extracting a subset of files (say, all 123 files on A: and C:) they can be sorted in either ascending or descending order by file name, extension, path, size, time/date as well as other criteria. The list shows the path, size and creation time and date of listed files. By highlighting the file name and pressing the Enter key, one may see a file's contents.

One way of cleaning up obsolete files is to find exact duplicates. These would be files sorted by name, regardless of path that have the same size and creation time and date. Sorting files by size can reveal identical files that have different names. If you are unsure of the contents, there is a compare function that will compare two files and report whether their contents are the same or different. The compare feature works without disturbing the current file subset and sort view.

File Organization

Beyond cleaning up files, one may also wish simply to organize them in a more logical fashion (Screen 1). Magellan simplifies file organization. For example, my Lotus 1-2-3 files fre-



Screen 1: Magellan lets you list all the files in a directory and view the contents of most files.



Screen 2: You can look inside a 1-2-3 file and scroll around — even copy and paste.

quently need reorganization. I usually place newly created 123 files in the default directory (C:_123\). Using Magellan, I can inspect them and move them to appropriate subdirectories. This keeps the default directory clear of clutter while placing the files in smaller directories where can be more easily found.

Fuzzy Searches

"Fuzzy" searches are easy and very useful when looking for files containing common elements. To do such searches, it is necessary to keep a file index. The index can become quite large. For my 20 million bytes of files, the index is about 500,000 bytes. However, once it is built, the index allows you to search quickly for any string of words that may appear in files.

The "fuzzy" search results in a list of files having any of the words. These are ranked by a goodness of match score. The goodness of match can vary from 0 (no match) to 100 (perfect match). Files with a score of 20 or less are suppressed. That default level is adjustable by the user. From time to time the index can be quickly updat-

ed. The update process adds only new or changed information to the index.

Launching

Magellan can also launch programs. Simply highlight the executable file and press F7. If there's enough memory to run the program (which is usually the case), the program will execute and return to

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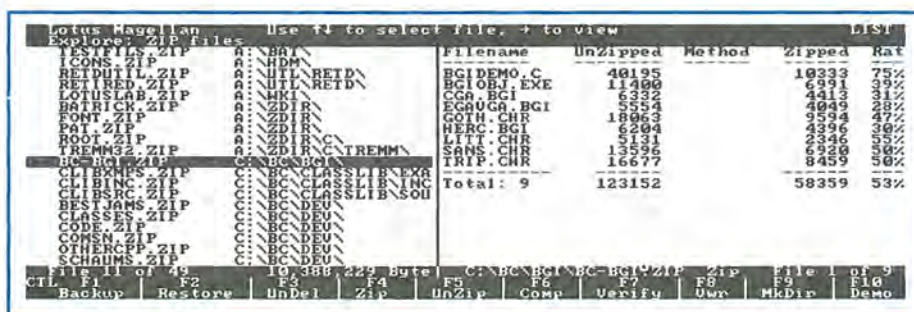
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Screen 3: You can gather all your GDB files in one list and peek inside them



Screen 4: Magellan will let you look inside a ZIP file. You can also adjust the size of the windows

Magellan upon exit.

No Support from Lotus

Unfortunately, Lotus stopped supporting Magellan a few years ago. As a result, there was never a Windows version of the program although it operates fine under Windows 95/98 and even has mouse support. To use a mouse, execute the program MGMOUSE.EXE instead of the usual MG.COM. I use it almost daily on my Pentium machine in preference to Windows Explorer.

The worst part about the lack of support from Lotus is that there are no viewers for files created by newer programs. Lotus Freelance for DOS files pop right up, but the Windows version files can't be examined. DOS versions of MS Word and Word Perfect files are viewed perfectly, but neither can be viewed in their Windows 95/98 versions. While older PKzip version files can be viewed and even unzipped, the newer version is unsupported although it is said that with a copy of PKzip 2.x and the Magellan launch feature, a macro can be created to work around that problem. I haven't tried that, though.

Tutorial

As you might expect, your freely downloaded copy of Magellan won't come with a manual, although it will have a file MGMOUSE.DOC explaining the mouse setup. Magellan is easy to learn by trying different features. It's hard to make any serious mistakes. The download will include a very good tutorial program with sample files that will lead you to other features of the system.

CompuServe

Fortunately there is a CompuServe Forum for Magellan. It is Section 7 of the LOTUSB forum. Lots of helpers lurk there. Not only that, but CompuServe messages have a special viewer that displays the file headers. To see a message, one simply highlights a header and then views it by pressing Enter.

Downloading Magellan

Lotus has placed a number of its older programs and certain Frequently Asked Question (FAQ) files on an FTP Web site. To download your copy, you can search for "Magellan" on either

www.palmtoppaper.com/download.htm or www.palmtop.net and you will get to the Magellan site quickly.

One of the files that will show up on a search is called MAG2INST.ZIP. This is a copy of Magellan 2.0 that has been pre-installed on an HP 200LX. The splash screen shows the user name and company as "Courtesy of... Thaddeus Computing, Inc." You can download this file onto your HP Palmtop and use the command PKUNZIP -d MAG2INST.ZIP and the file will expand into an automatically created \MAG2 directory. When you're satisfied with the performance of Magellan, you can download a copy of the program along with the viewer files you want and reinstall the program to suit your own tastes.

Summary

Magellan is a superb file management program well suited to the HP 200LX. It is easy to use and offers features beyond those available in HP Filer. HP users should seriously consider including it among their favorite utilities. ■

Freeware mentioned in this article

Magellan 2.0 — available as copyrighted freeware from Lotus Development Corp. It is available on both the 1999 CD InfoBase and at www.PalmtopPaper.com/download.htm

The preinstalled version of Magellan is also available at this location, as well as on this issue's *The HP Palmtop Paper ON DISK*.

Topping-Off Your Palmtop

Personalize your Palmtop by creating a set of custom Topcards. All it takes is the right tools and Gene Dorr's definitive recipe.

Eugene Dorr

As any good carpenter will tell you, the right tools makes all the difference between doing a job well or not doing it at all. The same is true when creating Topcards for your Palmtop.

Selecting The Right Tools

Although it is possible to create Topcards using just the Palmtop itself, the best tools for the job are those that work on a desktop PC with Windows (3.1x/9x/NT). Here are a few of the software tools that I and other users have tried. Start with a couple and add others as needed. The more tools you have the easier it will be to create Topcards with pizzazz.

Commercial Drawing Software

If you have a commercial drawing program from Adobe or Corel you've got the best tool already. On the other hand if you're looking for something less costly here are a couple of shareware and freeware programs that will perform almost as well.

Paint Shop Pro

Paint Shop Pro (PSP) is an image conversion and enhancement program available for all versions of Windows. It's shareware and is available on CompuServe in the Graphsupport forum. PSP will let you convert color images to black and white, change their brightness and contrast, sharpen or blur them, resize and crop them. It will also let you magnify an image up



Three Spheres, Sample Topcard

to 16 times to fill in details. It can import almost any type of graphic file and convert it to a .PCX file.

Graphic Workshop

Graphics Workshop (GWS) is a graphic enhancement and conversion tool from Alchemy Mindworks. It does almost everything that Paint Shop Pro can do except for drawing. It's available as shareware in the Graphsupport forum of CompuServe. There is even a version of GWS that will work on the HP Palmtop; but on a standard speed machine, GWS is aggravatingly slow.

WinGIF

WinGIF lets you adjust the brightness and contrast of images and convert color or grey scale images to

black-and-white. WinGIF is available in the "Windows Software" library of the CompuServe ZENITH forum. On the World Wide Web, you can find it at www.rad.kumc.edu/win31/viewers.htm.

LXPIC

Stephan Peichl created the LXPIC program for the HP 100/200LX Palmtop computers but it will also run on any DOS computer. LXPIC will let you convert color images to B&W and save them in .PCX format. On top of all this, it's only 6K in size and it's freeware! You can find LXPIC at www.palmtop.net/super.html.

Optional Hardware

If you plan to create Topcards from photographs or print media you'll

ABOUT THE AUTHOR

Eugene Dorr (edorr@pobox.com) has been programming HP handhelds since 1975, starting with the HP-65 calculator. More recent projects include CMCalc, VClock and PwrMon for the HP 200LX Palmtop. He finances his electronic gadget addiction by programming (in Java) for Progress Software, in Bedford, MA.



Bayeux Tapestry



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Finding Images

Once you've gathered the right tools the next task is to find or create images that will eventually become Topcards.

Unless you're rich or famous you won't find images of yourself or your family floating around in cyberspace but you can probably find something that relates to your life, your heritage, your hobby or your job.

There are literally millions of images available on the World Wide Web and CompuServe. These images range from clipart to prize-winning photographs. One of the best sources for these images is the Art Today web site at www.arttoday.com. It has over 750,000 copyrighted images and fonts: enough to fill 160 CD-ROMs.

You can download as many images as you want and use them for any purpose once you pay the \$30 per year subscription fee. However, you may find what you're looking for on one of the free Web pages devoted to graphic images.

The HPHAND forum on CompuServe has several collections of Topcards but many of these have not been correctly sized for the aspect ratio of the HP Palmtops.

When you're looking for images, select those that have moderate to high contrast and don't depend on fine detail. A picture with over two million colors may look great on a color display, but will look like a random pattern of black and white dots on the Palmtop.

If you want an image to fill the Palmtop's screen, the original image should have a landscape or horizontal orientation and be about twice as wide as it is high. If you find an image that doesn't meet this criterion, you can crop it to fit the Palmtop's screen.

Resizing and Cropping the Image

The Topcard image on the HP Palmtop requires a black and white image of exactly 640 by 200 pixels. Here's how to create an image that will fit.

Start Paint Shop Pro or WinGIF



Babylon 5 Space Station

on your desktop computer and open the image file on which you want to work. If your image is too large or too small reduce or enlarge it so that the width is 640 pixels. Let the program adjust the height so that the resized image has the same height to width ratio.

The next step involves "cropping" the image. Follow the instructions for your graphic program and select an

area of the image that you want as your Topcard. The trick here is to crop an area of exactly 640 X 240 pixels. Later in the process you'll reduce the size to 640 X 200.

If the area you select is less than 640 pixels wide, then resize the image again so that the width is 640 pixels. Let the program maintain the same height to width ratio.

When you enlarge or reduce an

image it will sometimes appear grainy. This effect will disappear when the image is converted to black and white.

Adjusting the Aspect Ratio

Once you have a 640 X 240 pixel image that looks good, use the Resize command in your graphics program. This time de-select the "Resize to Scale" or "Maintain Aspect Ratio" checkbox. Then, change the width to 640 and the height to 200 pixels and click the OK button. The image will appear somewhat flattened but that's the way it should look at this point.

Converting the Image to Black and White

The goal in this step is to produce a two color (black and white) version of the image. Two colors is the maximum that the HP Palmtop's Topcard viewer can handle.

If you're using Paint Shop Pro use the Colors, Grey Scale command. If you're using WinGIF continue working with the color image. Use the contrast and brightness commands in your graphics program to get a bright, high contrast image. Then, and only then, convert the image to black and white. In WinGIF do this by selecting the Edit, Monochrome, Dither command. In PSP use the menu and select

Graphics Terminology

Aspect ratio: the ratio of an image's height to its width.

Dithering: to reduce color images to black and white by replacing colors with dots, dashes, and x's that, at a distance give approximately the same impression as the original image.

Filters: alter an image or selection to achieve a particular effect. Filters alter each pixel's color based on its current color and the colors of any neighboring pixels.

Grayscale: Depending on the display there may be between 4 and 64 different shades of gray that may be substituted for the colors in an image.

Orientation: If an image is taller than it is wide, the orientation is referred to as portrait. Otherwise the orientation is called landscape.

File Formats: There are almost as many ways to store a graphic image on disk as there are producers of these images. Here are a few of the more common file name extensions for such graphics files.

ART: PFS, First Publisher

BMP: Windows

EPS: Adobe PostScript

GEM/IMG: Ventura Publisher

GIF: CompuServe Graphic Image File

HGL: HP Graphics Language

JPG: Joint Photographers Graphics

MAC: MacPaint

PCX: PC Paintbrush

PIC: Lotus Graphic File

RLE: Older Windows

TGA: Truevision Targa

TIF: Many scanners

WPG: WordPerfect Graphic

WMF: Windows Meta File

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Colors, Decrease Color Depth (2), Error Diffusion, Floyd-Steinberg. This will "dither" the image i.e. turn pixels on and off to emulate different shades of grey.

At this point you should have a good idea of how the image will appear on the Palmtop. If you don't like what you see try adjusting the brightness and contrast and dither the image again. Repeat these steps until you are satisfied.

Reversing the image

Since the Topcard viewer in the HP Palmtop presents a "negative" version of the image, you'll need to create your own "negative" image so that the two negatives will make a positive.

Paint Shop Pro will let you create a negative image with the Colors, Negative command.

WinGIF does not have such a "negative image" feature. Instead, save your image and switch from WinGIF to the DOS prompt and run LXPIC on your desktop. Just load the positive image into LXPIC, press the "I" key to invert it and press F5 to save the screen as a B&W .PCX file. Give the file a new name and press Enter. Load the negative image file into WinGIF to see what it looks like.

Adding Text (Optional)

Paint Shop Pro will let you enter text in an image; WinGIF will not. In the latter case, you can use an older version of Window's Paintbrush to add text. In that case, use the "outline" font style to make the text stand out against a grey background.

When adding text, pick a font that sets off the image. Make sure the text stands out from the background. Use font size 12 or larger and make the text bold.

When you're satisfied with the composition of the image save it on your PC. Use whatever transfer method you prefer to get the image onto your Palmtop.

Using Setup to Select New Image

Tell your HP Palmtop about your new Topcard by opening the Setup application (CTRL + Filer). Press MENU, Options, Owner..., ALT + Picture and pick the .PCX file you created. Press F10 (OK), F10 (OK), MENU, Quit. Close all open applications, and admire your new Topcard.

If you want owner information to appear in the middle of your Topcard you must store your .PCX file in the C:_DAT subdirectory with the name

TOPCARD.PCX.

If the Topcard does not appear and you hear a beep, then there's something wrong with the Topcard file. Either there are too many colors remaining in it or the size is incorrect.

Sample Topcards

I get bored looking at the same pictures all the time. In my office I change the wall hangings every so often. On the other hand, I let my Palmtop change its own Topcard. I use the following two System Macros to do this.

Select a Topcard
(Setup){menu}oo{Alt+P}a:\usr\pcx*.pcx{Enter}{Tab}

Finish selection
(F10){F10}{Menu}q

You'll need to adjust these macros to suit your own setup. If you end up with a collection of Topcards on your Palmtop, you may want to create a subdirectory just for storing Topcards (mine, as you can see from the above macro, is a:\usr\pcx). ■

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Freeware/Shareware mentioned in this article

Graphic Workshop v.7.0e, (shareware) from Alchemy Mindworks, Inc.; P.O. Box 500, Beeton, Ontario LOG 1A0, Canada. Registration: \$40

WinGIF, version 1.4, (shareware) SuperSet Software Corp; PO Box 50476, Provo, UT 84605-0476. Registration costs \$15.

Paint Shop Pro, (shareware) \$69.00, available from JASC, Inc.; PO Box 44997, Eden Prairie, MN 55344 USA; 800-622-2793 or (612) 930-9171; FAX (612) 930-9172

LXPIC, (freeware) from Stephan Peichl available from www.PalmtopPaper.com and on the 1999 CD InfoBase from Thaddeus Computing, Inc.

A Student and a Palmtop

A busy college student takes time out to describe how he uses the Palmtop in and out of the classroom.

by David Sargeant

Since 1994, when I joined the HP Palmtop community, my life has changed drastically. One thing that has stayed constant, however, is school. It seems I'm always going to one class or another. There's always a report, a presentation or a project due in the next few days.

How do I manage to fit fulltime course work into my busy schedule of full-time family duties, fulltime career, overtime avocation? The answer, of course, is that I use my Palmtop fulltime.

The HP 200LX is well known for being a multi-talented machine. Most, if not all, of these talents can be put to use by students of all types to make the educational experience less painful and more rewarding.

There are several different aspects of the Palmtop-savvy student's use of the 200LX, each of which I'll describe.

The Built-In Apps

Most of the built-in applications can be put to good use by a student. The most obvious use, and the reason I bought my Palmtop originally, is to use Memo to take notes in class. The HP 200LX's keyboard is unsurpassed in the palmtop/handheld world for speed of entry, with rates of 40 words per minute not uncommon. One user even reported 70 wpm on the palmtop keyboard in Memo. You may not

be able to record every word that comes out of the professor's mouth, but you'll come close and the outlining feature of Memo will make it easy to organize lectures into logical blocks that can be learned more easily.

When you're finished taking notes, you can copy them to your desktop—if you have one. If not, a serial or infrared printer can be used to print a quick copy right from the palmtop. On the other hand, why print? The 200LX is easy enough to carry around, and less likely to get torn or lost. You can review study material on the screen while watching your favorite movie. (And try not to get distracted.)

The Appointment Book is another very useful application for students. What I do is create a repeating appointment for all of my classes and then, as I get due dates, I add new appointments set to go off well in advance so I won't put off a crucial paper until the night before. When I get a homework assignment, I hit F3

(Note) and enter it into the appointment for that class on that day. At the end of the day another appointment goes off and reminds me to check for homework lest I forget. In this way I prevent myself from letting any deadlines slip by.

The Phone Book is a great tool for the typical student. Not only does it allow you to keep track of the names, numbers and e-mail addresses of all your friends and study partners, it lets you keep track of your professors and their pertinent information such as office locations and hours.

Who really keeps the syllabus for a class for the full semester? Not me. But having the contact information for an instructor in a special phone book has saved me from many misunderstandings on assignments. By knowing when to show up at the office to ask a question, I've narrowly avoided making huge errors.

The built-in database program has many applications that might be useful for students. One of the best edu-



ABOUT THE AUTHOR

David Sargeant lives in Boulder City, Nevada with his wife and two little girls. He is a computer engineering student at the University of Nevada at Las Vegas and computer system administrator for a local company. In his spare time he maintains the www.hplx.net Web site that is devoted to things "LX". David can be reached at david@hplx.net

cation-oriented databases is called DBLearn ■ and it's available from the download section of www.PalmtopPaper.com. DBLearn lets you use your database like a set of old-fashioned flash cards like the ones you used in elementary school. You can enter questions in one field of the DBLearn database and put the answers in another field. DBLearn will then randomly select questions for you to answer and keep track of the score. This is extremely handy for memorizing anything from formulas in a statistics book to the answers for your favorite Trivia game.

Lotus 1-2-3 is also a great tool for a student. It allows sophisticated mathematical analysis in the palm of your hand. I use 1-2-3 to keep track of data points during the course of labs, and then instantly analyze the data.

sophisticated formula that lets me compute the score I must get on a test to avoid failing the class. (As if an HP 200LX user would ever fail a class.)

Thus we see the main student uses for the built-in applications on the palmtop. Which brings us to:

External Applications

The built-in applications are great for student use, but with a few well-chosen external applications added to your arsenal, you can become academically invincible.

You'll want a good dictionary on your palmtop; Thaddeus Computing sells an excellent product in the form of the Collins Dictionary and Thesaurus. This is an absolute must for school. All colleges require a solid core of language skills and you want to avoid misspelling and misusing

and relatively complete.

Another must-have, word-oriented tool is a GREP type program. GREP will let you track down a word or phrase in all the different files on your Palmtop and list the lines on which the word occurs.

Sure, the MENU, Options, Text Search... command in Filer will do almost the same thing but it doesn't go far enough. It will find all the files that contain the word for which you're searching but it doesn't actually find the word. On the other hand, the Global Search program (GS.EXM) is System Manager compliant and, when GS finds a word in any of the files created with one of the Palmtop's built-in applications, it will let you automatically launch the application and run the built-in Find command. It may not be the fastest program you'll ever run but it sure beats digging through pages of hand written notes looking for a lost reference. This is especially true at the end of a semester when you're preparing for a final test.

A good drawing program is always handy for taking notes that require graphics. I use AutoSketch 1.01 on my palmtop, along with the Cirque Easy Cat touchpad. The Easy Cat is a very small and very inexpensive companion for the palmtop. It gives me all the flexibility of a mouse in a smaller form factor. This combination (AutoSketch and a touch pad) allows me to take notes in classes such as chemistry, where I often need to draw circles and the like to represent atoms.

Derive is a math student's dream come true. A powerful symbolic calculation utility, Derive can turn your palmtop into a lean, mean, problem-solving machine. Derive can handle tough integrals and derivatives without batting an eye. And it's a very compact program as well, easily fitting on your C: drive. Derive's interface is not intuitive but the manual that accompanies it will make an expert out of you in no time.

There are plenty of utilities on the SUPER site for the more scientific-

The built-in applications are great for student use, but with a few well-chosen external applications added to your arsenal, you can become academically invincible.

This allows me to fill out the reports faster and more accurately than I could do on my own.

In addition I use Lotus 1-2-3 to enter the grades from my report card and have it report on my semester and cumulative GPA's. You have to keep on top of these things when you have scholarships.

Ed Keefe just sent me a copy of his GPA.WK1 worksheet ■. It looks rather complete. It works for grading systems that use A, A-, B+ grades as well as the usual A, B, C grades. It even has a formula to compute what GPA you must earn, down the road, to maintain or improve your final, overall GPA.

HP Calc is, of course, useful for math classes and also statistics and accounting courses. The Solver application has allowed me to develop a

words in any case. Poor language skills will not only affect your grades, but could send an otherwise sterling resume into a thousand circular files. In short, get a dictionary for your palmtop even if it means buying a larger flash card.

Those studying other languages will want to check out the Collins Multilingual Dictionary as well.

Since most dictionary programs let you enter new words, you can use this feature to create your own list of abbreviations and use them to improve your typing speed. Just prepend an easy to type character, e.g. "*" to each abbreviation you create. After a note-taking session in which you've used your abbreviations, run the dictionary program and you'll have notes that are readable

Using the 200LX to Cheat

One use for a Palmtop computer that many students see right away is to use it to help out (i.e., cheat) on exams. It's no secret that calculators like the HP48 and the TI-8x series can be used to store notes. On a Palmtop this is taken to a whole new level. Entire textbooks of information could be carried into an examination and used.

I don't use my Palmtop in this way because of my ethical convictions. I bolster my ethical convictions with the dire thought that I might get caught and my Palmtop would be confiscated and held indefinitely for evidence. If that happened, not only would I be out of school, I'd be out of business and maybe even out of my mind.

ly inclined student. The Palmtop Periodic Table is a great reference for chemistry students and SkyGlobe is probably the handiest resource an astronomer could ask for. CMCalc helps do computer related math, and PSpice on a palmtop is a great electrical engineering tool.

The ability of the palmtop to compile C++ programs is a very handy one for computer science students. C++ is generally the language taught these days. In my last programming class I was able to type all of the programming assignments into the palmtop (often during the lecture) and compile them right there. Sometimes I'd have the entire assignment done during class, and I could then e-mail it (right from the palmtop, using Post/LX) to the grader for comment. You can bet I got an "A" in that class.

Making the Most of Limited Time

The third aspect of using a palmtop as a student is more philosophical. Students are busy. They're trying to learn material that's often difficult and they are usually judged by results rather than effort. Because of this, the 200LX is uniquely suited for student life. The powerful PIM functions can help organize your activities so that you don't waste time or forget what you are supposed to be doing. Along these same lines, having a Palmtop with you at all times allows you to work on assignments whenever you have the time. A large essay can

quickly be cut down to size when you work on it a few sentences at a time during breaks at work, or at a stop-light, or in line at the bank. This allows you more time to revise, and to think about what you're writing, leading to a higher-quality finished product. Expect higher grades when you conscientiously use an HP 200LX to help with your studies.

Most importantly, the HP 200LX can be used by students for the very reason they go to school in the first place: to learn. When there is a vast amount of information on a variety of subjects in your pocket, you're more likely to learn and remember. As a simple example, suppose you step outside to take a break from studying one night and see a particularly bright star in the sky. You wonder why that one is so much brighter than the others. If you were just an ordinary person, you would probably puzzle over it for a minute or two, then shrug it off and forget about it. Since you have your Palmtop, you can start the SkyGlobe program and check it out. From then on, you'll remember what the name of that brighter-than-usual object is. You've learned something you otherwise wouldn't have, thanks to the palmtop.

Given all that, it's difficult to see why any student wouldn't want to use an HP Palmtop! ■

Freeware mentioned in this article

Global Search, PSpice, Palmtop Periodic Table, CMCalc, SkyGlobe 3.6, and XGREP — all available from the download section of *The HP Palmtop Paper Online*, www.PalmtopPaper.com/download.htm as well as the 1999 CD InfoBase from Thaddeus Computing, Inc.

DBLEARN.ZIP and GPA.ZIP — available on this issue of *The HP Palmtop Paper ON DISK* and from www.PalmtopPaper.com/download.htm

Commercial products mentioned in this article

Derive: The Mathematical Assistant — available from SOFT WAREHOUSE, INC. 3660 Waiialae Avenue, Suite 304, Honolulu, HI 96816, U.S.A.; Phone: (808) 734-5801; FAX: (808) 735-1105; Web: www.derive.com; Cost: \$199 (\$69 for teachers or students with proof of school affiliation).

Collins Dictionary/Thesaurus and Collins Multilingual Dictionary — available from Thaddeus Computing, Inc.; Web: www.PalmtopPaper.com

Easy Cat — \$26.95, is available at most computer stores (e.g. CompUSA.)

AutoSketch 1.01 — no longer available.

Post/LX — part of the WWW/LX suite by D&A Software. A demo is available at www.dasoft.com and includes instructions on registration.

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Through the Looking Glass: Data-Basics

Ed presents a compendium of tips, tricks, traps and techniques (some old, some new) for creating and using the database applications in the HP 100/200LX.

by Ed Keefe

Before diving into this article, please take a few seconds to see if you can answer some questions about the database applications in the HP Palmtop.

If you can answer all of the questions you already know everything about "data-basics". You can skip this article and wade into the article about using the Subset Language in the HP Palmtop's database engine (page 21).

A Baker's Dozen of Questions

1. What are the HP Palmtop's "database" applications?
2. What are the two "views" in each database application?
3. What additional "view" does the HP 200LX have that the HP 100LX does not? What's this new "view" good for?
4. How many pages can a database application have? What key(s) do you press to get to a different page?
5. Where can you find dozens of sample databases for the HP Palmtop?
6. How do you start to create a database and where do you go after you get started?
7. What are some guidelines for creating a custom database?

8. What are the various types of fields you can have in a database?
9. What are the limits to the various types of fields in a database and to a database file itself.
10. What are a couple of ways to get large amounts of text into a Note field?
11. What's a subset and how do you create subsets?
12. What's a "smart-clip" and what is this feature good for?

13. Where's the "report generator" for the Palmtop's database programs?

The Answers: Not Necessarily in the Order of the Questions

This article uses a custom database file as a medium for describing some of the tips, traps and techniques involved with using and creating databases on the HP Palmtops. Even though the topics in the article will emphasize the Database application, they will apply to the Palmtop's

Database: GENERAL All Database Items 09-JAN-99 9:45 am									
Text Field	Category	Date Field	Ed	R	P	N	B	I	A
00 Text field sample. Te	GenInfo	05-JAN-99	✓				✓	✓	
01 Accommodating multiple	Technique	07-JAN-99	✓		✓				✓
02 Arithmetic Missing but	Technique	07-JAN-99	✓	✓					✓
03 Category field has the	Categ;Lim	07-JAN-99	✓		✓			✓	
04 Changing Categories in	Categ	06-JAN-99	✓		✓				
05 Copy Note To Appt Todo	Clip	06-JAN-99	✓		✓			✓	
06 Copying Phone Book entr	Clip;Tip	06-JAN-99	✓		✓			✓	
07 Create Your Own ALT Sho	Tip	06-JAN-99	✓		✓				
08 Creating a blank copy o	Technique	06-JAN-99	✓		✓			✓	
09 Customize The Fields in	Tip	06-JAN-99	✓		✓				✓
10 Database, PhoneBook, Wo	GenInfo	06-JAN-99	✓		✓		✓		

Screen 1: The List View lets you speed-locate an item.



ABOUT THE AUTHOR

Ed Keefe is an author and editor of *The HP Palmtop Paper* and the book *PC In Your Pocket: Information When You Need It*. Ed is also a former college instructor of logic and computer science and a consultant in the computer industry. Ed can be reached at ed@thaddeus.com

Phonebook, NoteTaker and World-Time databases as well. These four database applications are what I call "feel-alike" instances of the Palmtop's database engine. The fifth instance of the database engine, the Appointment Book, is so unique that it belongs in a class (and an article) by itself.

They're All The Same

Not only do these four applications "feel-alike", they are alike. They're all instances of the same program. The only thing different about them is their data files and apparently the only thing that makes a NoteTaker file different from a Database file is one character. If you change the twelfth character (byte) in any file that has the extension GDB, NDB, PDB or WDB you can open that file in the general Database, Phonebook, NoteTaker or World-Time. See the Quick Tips article in this issue for the way to change .GDB files to either .NDB or .WDB file.

The database applications feel alike because they all present information in the same way.

When you open a database file in any of these applications, you'll see a list of data items. The User's Manual refers to this as the List View (Screen 1).

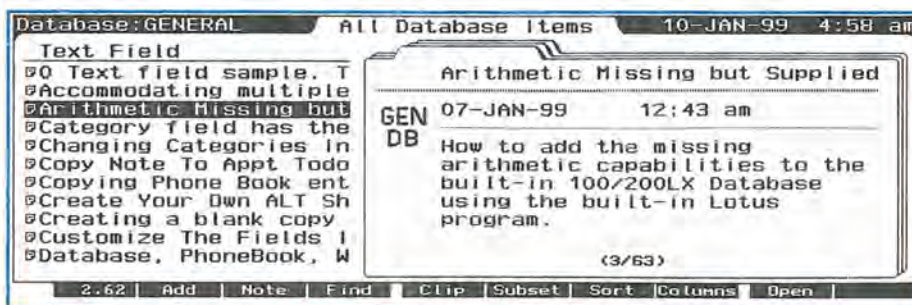
If you highlight an item in the list and press the Enter key, you'll see all the information in the item. The User's Manual calls this the Data Item view.

On the HP 200LX, the Database, NoteTaker and Phonebook also have a Data Card View which is a split screen view with a partial List View on the left half of the screen and a limited Data Item View on the right (Screen 2).

The List View lets you scroll through the items in the database file. It also has a feature called speed-locate that lets you find an item quickly. Just start typing and the highlighter will jump to an item that matches the characters you've typed. When the match fails, the Palmtop will beep..

In the Data Item View you can press the F7 or F6 function keys to move to the next and previous items in the file.

The Data Item view can have up to



Screen 2: The Data Card View is a split-screen view

four screens. Pressing the Page Up or Page Down arrow keys (Fn+Up-Arrow or Fn+ DownArrow) will cycle you through the screens.

What's a Database Good For?

Most Palmtop users are familiar with the Phonebook database. Many have turned it into a contact manager and some have made it a small project manager. For these folks, the Phonebook is their business. You don't have to tell them what this it's good for: they'll tell you.

Palmtoppers who work with ideas and words seem to prize the NoteTaker database. It's a great way to eliminate all those Post-It notes. A couple dozen keystrokes is all it takes to save, recall, improve or wipe out a passing thought that might otherwise be lost.

Road warriors and world travelers have found the WorldTime database to be indispensable.

But what about the general Database application itself: what's it good for?

The Database application is best suited for storing and retrieving more complicated information.

To get an idea of the kind of information you can store in a database, take a look at a few of the databases at www.palmtop.net/hp_db.htm. There are almost 100 databases at this Web site that contain information ranging from "area and country codes" to "USDA nutritional facts." I'm sure there are thousands of other databases in daily use, but the information in them is confidential. We'll never know what they are or who uses them.

The best place to look for information for a database is in your own areas

of expertise. Hobbies, jobs, avocations, and interests all contain data that you use on a daily or weekly basis.

If you're not an expert in an area but would like to be one, the Database application can be a great learning tool. Load in the information and take it with you.

The only type of information the Palmtop databases can't handle is anything that requires computations. You can't use the databases to calculate commissions, track budgets, or tally expenses. If you need that capability, there's always the built-in Lotus 1-2-3 or Quicken programs.

Likewise, if your information is such that it would need more than 99 fields per item or more than 5,000 items per file, then it's time to get an add-in database such as DataPerfect..

(The limit of 5,000 items is stretching things a bit. If you have records with lots of fields or large notes, the 5,000 item limit drops to 3,000 or less.)

Building a Database

Suppose you have some information and you want to try building a database. Where do you start?

Actually, the best place to start building a database is at your desk with your Palmtop turned off. Take a piece of paper and write the words

"I want my database to..."

at the top of the paper. Then write down what you want the database to do for you when it's working.

An Exemplary Database

Let me illustrate the process by describing a database that contains information about the Palmtop's data-

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Applications

HV (Hypertext Viewer)

HTML browser to view Web down-loads.

PE (PalEdit)

A MEMO-like editor with many enhancements including spellchecker.

VR (Vertical Reader)

Lets you read doc files and electronic books, vertically on the palmtop.

DBV (DataBase Viewer)

Fast phone, appt and database file viewer.

View

Lets you vie files from a variety of word processing formats.

Tune

Metronome and musical tuner.

ZIP

Fast PC to palmtop serial transfer program.

Draw

Palmtop drawing/paint program

PC Outline

Enter thoughts, plans ideas, and organize them into a hierarchical structure.

Stereo Shell

DOS File Manager.

garlic

Fixes corrupt database files.

PKZIP

File archiver compressor.

LHA

File archiver/compressor.

LXPIC

Lets you view GIF, JPG, BMP, PLX graphics files.

Andrew3

More readable palmtop font.

CloseFir

Close Firer to save memory.

Buddy

Zillion utilities in one.

fastdb

Speeds up database programs (e.g. Phone).

MoreEXM

Breaks system limitation of 7 EXM files. Enable software like ZOOM.

Typing Tutor

Type faster on the palmtop.

Zoom

Wonderful Magnify-like program that enlarges and makes more readable any section of the screen in built-in apps. For example can blow-up datacard for more readable phone numbers.

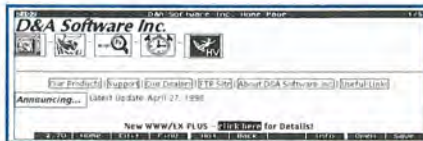
Subst

DOS 5 utility superior to ASSIGN.

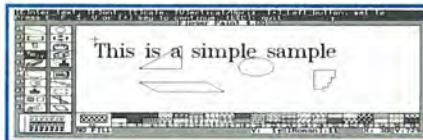
Vclock

Whole screen clock and timer.

Here's a brief preview of what SUPER Software Carousel does for your palmtop!



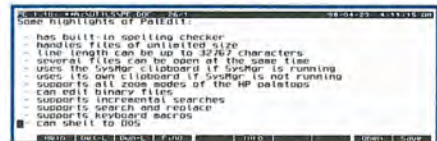
Use HV and LXPIC to view web documents graphics.



Paint, Flowcharts and maps with Draw



LXPIC can view PCX, BMP, JPG, GIF files on your palmtop.



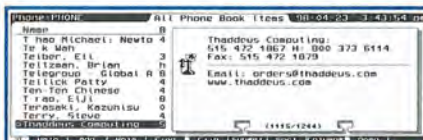
Advanced editing with MEMO-like PalEdit with spell checker.



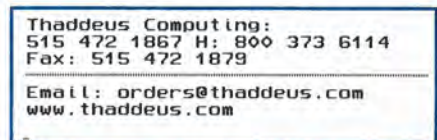
Read literature or documentation on palmtop sideways.



Visible Clock: Full screen clock, timer, stopwatch.



Zoom blows up any phone book, appointment book, or database item. Above is a before and after view.



Games

Dominoes	Golf	Mine Sweep	Solitaire
FreeCell	Blackjack	Reversi (Othello)	(many kinds)
Yahtzee	Bridge	Sokabin	Therapist
42 LX	Hearts	Boggle	Play Music
Cribbage	Backgammon	Chess	3-D Tic Tac Toe
Tiles (Mah	Checkers	Go	Worm
Jhong)	Tetris	777	
Klondike	MasterMind	Go-Moku	

Here's how to order:

Super Software Carousel comes on a CD with complete, easy-to-follow installation instructions and a concise electronic User's Guide.

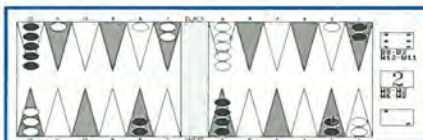
If you have Thaddeus Computing install it while your palmtop is with us (free installation) you'll still receive the CD. (You can even send your palmtop just for the free Software Carousel installation.)

If you are upgrading from a previous version of Software Carousel, see **How Do I Upgrade?** on previous page to save \$60.

Super Software Carousel (New)	\$139.95	# SSCN
Super Software Carousel (Upgrade)	\$79.95	# SSCU

System Requirements

Includes the complete version of Software Carousel, plus lots of additional software. Runs on HP 100LX, 200LX, or 1000CX on flash disk or in system RAM (C drive). Full package requires 5 meg: a little over 2 meg for applications, 2 meg for games, and 1 meg for Software Carousel sessions. Even more applications than listed are included on CD.



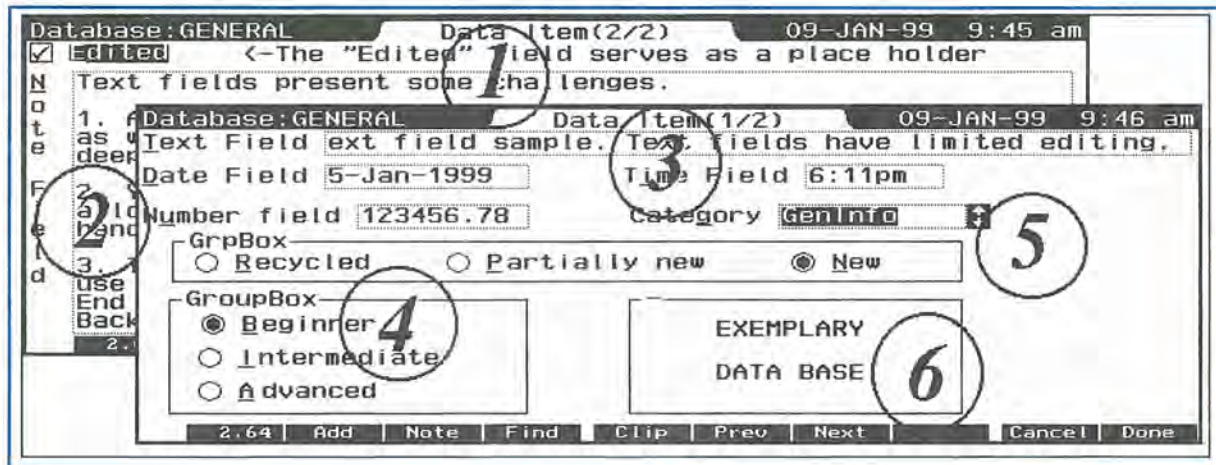
Here's how Backgammon, FreeCell, Chess, and a Go tutorial look on the palmtop. Other games include Tetris, Checkers, a music selection, and a palmtop therapist.



Apps

Zoom Anywhere

Games!



Screen 3: Data Item or Record View

base applications.

Here's what my "want list" contains.

"I want this database to..."

1. serve as a pedagogical tool.
2. contain all known tips and techniques about the Palmtop's database applications.
3. illustrate all the different types of data that the database engine can handle.
4. illustrate the traps and techniques in constructing a database.
5. be modifiable so that others can change the layout, delete and add fields and add yet more tips.
6. be visually appealing and easily navigable.

Designing the Data Item View

In the good old days, designing an input/editing screen for a database was a task that started with paper and pencil. Once you had a detailed picture of the screen's layout you would spend days coding and testing the program that would let users work with the screen.

The database engine in the HP Palmtop makes the task of designing a Data Item (editing) screen relatively easy and code-free.

To create the screen, use the command MENU File Define New Database. You'll see the Add Field dialog box. At that point you can type in a name of a field and press the Tab key

to pick a Field type from a list of 10 different data types, namely Text, Number, Date, Time, Label, Group box, Option, Checks, Category and Note.

Once you've chosen the field type you want, you can press F10 (OK) and use the arrow keys to move the field around the screen. You can also press the F3 key and use the arrow keys to resize the field. If you hold down the Shift key while pressing the arrow keys you'll get fine control over the position and size of the data field.

Screen 3 above shows the layout of the Exemplary Database. The numbers with circles around them relate to the large numbered sections in the following discussion.

1 I could have squeezed all the fields for the Exemplary Database onto a single page with a couple of lines at the bottom of the page for a Note field. Instead, I chose to use two pages. The "Data Item (2/2)" at the top of the screen shows that this is the second of two pages.

The Check box called "Edited" is the first field on the second page. This field serves two purposes. It reminds me to edit the text and it improves the navigation between pages.

Ordinarily you can move from page to page by pressing the Page Up and Page Down keys. However, if the Note field is at the top of the page, the Page Down key will put the cursor inside the Note field where pressing the Page Down key only moves

the cursor in the Note field. The only way out is to use the Tab key to move back to the first page. Putting a field ahead of the Note field gets around this surprising behavior of the PageDown key.

While we're on the topic of Check boxes, here's a tip.

If you're designing a database that has several Text fields for "key words", change the text fields to Check boxes. When you're entering data in the database, it's easier to move to a check box and press the space bar than it is to type in the same key word over and over again.

The second page also demonstrates a couple of tricks you can do with the "Label" Field.

Labels usually describe something on the screen. They don't appear in the List View and they're limited to about 20 characters.

If you need more than 20 characters for a label, you can use several label fields and place them next to each other. If you want a vertical label you can create a label field for each character in the label and put the fields beneath one another.

2 There's a good reason to put the Note field on a separate page. The database will work more quickly that way. This is especially true if the Note field contains a lot of text or if your Palmtop has not been turbocharged with a double speed upgrade.

If you want to speed up a database

even more, install the FASTDB.TSR program in the C:_DAT directory and reset the Palmtop. FASTDB prevents the database engine from "packing" the disk file every time you edit a database file.

A Note field can have almost 30 screens, enough to hold 32,000 bytes of text, but you can only have one Note field per record.

Each Note field in the Exemplary Database contains from four lines to several thousand lines of text. Rather than key in the information, you can use the System Manager's clipboard to copy text from a Memo document and paste the text in a Note field. An easier way to bring text into a Note field is to press the F3 key to get a full screen view of the Note field and press F3 again. Then type in the name of a text file that contains the information and press Enter. This will insert the text into the database.

To make a Note field more readable, format the text before you insert or paste it into the Note field. Use a text editor or word processor that will let you remove tabs and extra spaces from the text. Format each paragraph so it has a hard carriage return only at its end. This will insure that the Note field will wrap the text within its borders and prevent ungainly line breaks.

3 The first page of the Data Item view starts with a Text Field. You can have as many text fields as you want in a database. (up to 99) and a Text field can be anywhere from two to almost sixty spaces wide. When you enter data in a text field, you'll be able to enter about 50% more characters than the width of the field. Text fields have one minor nuisance feature: you can't use the CTRL+ arrow keys to hop from word to word when you're editing.

I included the Date, Time and Number fields to show how the database engine handles these field types.

When you enter a date or a time in its respective field the date or time will change to the format chosen in the Palmtop's Setup application (Ctrl



Screen 4. DBView Does Simple Arithmetic

+ Filer). The Number field type will also insure that you enter only numbers in the field.

These fields also demonstrate the use of "hot-keys".

Hot-keys let you hop over fields when you're entering or editing information. Ordinarily you move from field to field by pressing the Tab or Enter key. If you want to hop to a specific field, give the field name a "hot-key". For example, the hot-key for the Date field is ALT+D. To create this hot-key, put an "&" (ampersand) before the chosen letter when you're entering the Field name in the "Add fields" dialog box.

Hot-keys are tricky to get right. On the one hand, you can use the same hot key for more than one field. For example the ALT+I key hops to the Time and Intermediate fields in the Exemplary Database. If, on the other hand, you want to avoid duplicate hot-keys, you have to pick another letter in the field name. For instance, to avoid duplicate ALT+N hot-keys for "Number field" and "New", I chose to put an ampersand before the "u" in "Number". An important tip for picking hot-keys is to avoid using the letters F, E, V, S, O, Q, and H since the database itself has appropriated these keys for its pull down menu.

When you're designing a Data View screen it's often a good practice to add all the fields at once and press F10 (OK) when you're done. Then you can move the fields around so they are in the right order.

Take care when moving the fields. The trick is to get the cursor to move

from left to right and from top to bottom in the working database. To make sure this happens superimpose one field on top of the other until the horizontal borders seem to grow dim (use the Shift arrow keys for "fine movements") then slide the field left or right.

The Number field on the first page is there mostly to remind me that the database engine doesn't do math which for many database programmers is the greatest shortcoming of the database application.

As a workaround for this shortcoming you can quit the database engine and load a database file in the DBView add-in program. DBView will do simple arithmetic on number, date or time fields for either the whole database or subsets of the database (Screen 4).

4 The Exemplary database contains two sets of Group buttons to show that you can display these groups either vertically or horizontally. Group buttons are useful since they give much more flexibility in creating subsets for a large database (see the article on subsets on page 21). The only trick to using Group buttons is that you have to put them inside a group box. Unlike Check boxes, they cannot stand alone but must be wrapped up in a Group box.

Group buttons are sometimes called Radio buttons since they are like the buttons on car radios. If you depress one button the others will all be off.

You can have as many Group buttons and Group boxes as you need.

Group boxes have an unusual way

of handling hot-keys. If you assign a hot-key, say ALT-G, to a Group box hoping that this will put the cursor on the GroupBox label, you'll be surprised to see the cursor jump inside the Group box and land on the Group button that is currently on or to the first Group button if all the buttons are off. If you want to toggle the button off, you'll have to use the arrow keys to move to another button and press Tab or Enter to lock it on. The way to avoid this nuisance feature is to avoid assigning hot-keys to group boxes.

5 The Category field in the Exemplary Database points up the fact that you can only have one Category field per database. If you want more than one, try the following trick: change the category options into a series of Check boxes. After all, the options in a Category field are just a group of check boxes disguised as a pull-down pick list.

This trick of turning category options into Check boxes will overcome another limitation of the category field. Theoretically you can have up to 32 options in a category field. However, the total number of characters for the names of all the options cannot exceed 255.

If you need more than 32 options consider using Check boxes instead. When you're entering data in a working database, it's easier to fill in a check box than it is to pull down a list and look for the right option.

On the other hand, once you type in a category option, you don't have to type it again. Just press the down arrow key to activate the drop down list and type the first letter of the category word as often as needed to find the option you want and press the spacebar.

You can also combine options. For instance, some items in the Exemplary Database are both Tips AND Traps. To combine options just pick more than one category word. The database will add a semicolon between the words automatically.

To delete a category option, you have to pull down the list box and

highlight the option and then press the Delete key. You can't delete the word merely by pressing the Delete key when the drop down list is not visible.

6 The region labeled "6" shows another use of Label fields and Group boxes.

I wanted the title "Exemplary Database" to appear in all Data Item screens. To accomplish this I created two Label fields called "Exemplary" and "Database", moved them to the lower right of the screen and then surrounded them with a group box. If you look closely you'll see that the Field Name for the Group box is actually a minus sign.

Modifying the Database

When you get a copy of the GENERAL.GDB file you can make it your own by deleting the superfluous fields, adding your own fields and arranging the others to your own liking.

To do all this get to the List View and use the MENU File Modify command (MENU FF).

In the "Modify Database" screen the Tab key is the only key that will let you move from field to field.. The arrow keys will either move the field or resize it.

Use the F7 key to delete fields and the F4 key to change the names of the fields. For instance, you could change the field name, "Text field" to "Title".

If you delete all but the Title, Category and Note fields, you'll have the equivalent of a standard Note-Taker file which will be smaller and faster. To move the Note field to the first page, tab to the note field, cut it with the Fn+ Cut key and press the PageDown key and immediately press the Fn+Paste key. Use the Move and/or Resize key (F3) to put the fields in a NoteTaker layout. Finally press F10 when done. All of this will trim about 4000 bytes off the size of the file. However, even though the database file has the look and feel of a NoteTaker file, you won't be able to open it in NoteTaker: not even if you

rename the file to GENERAL.NDB. However, all is not lost. See the Quick Tips article in this issue to discover three ways to convert a .GDB file into an .NDB file.

Generating a Report

Many other database programs have the ability to generate printed, columnar reports, complete with subtotals and grand total. The Database engine in the HP Palmtop does not have such a function. However, several users have found that you use the Smart Clip function to produce the raw material for a columnar report. The Smart Clip function will let you set the spacing for each output field. You can also specify whether you want data to be right or left justified or centered in a printed column. Granted, getting the Smart Clip to produce a readable report using the built in spacing commands takes some trial and error.

Others have found that it's simpler to use the Smart Clip function to produce a Comma Delimited Format file. They just print the data to a disk file and then import the CDF file into Lotus 1-2-3 or DataPerfect. Both of these programs have good to excellent report generating capabilities, complete with page and column headings, date and time stamps and automatic page numbers. ■

Freeware mentioned in this article

GENGDB.ZIP is available in this issue of *The HP Palmtop Paper ON DISK* and at www.PalmtopPaper.com/download.htm

DBVIEW is available on the 1999 CD InfoBase as well as on Compuserve in the HPHAND library and at www.PalmtopPaper.com/download.htm

Programmers' Corner

Database Subsets and SSL

To slice and dice your databases and serve them up your way, use the built-in subset function and add a dash of SSL.

Ed Keefe

How do you speed up the speed locate feature in a large database?

How can you sort a database on a date or time field and still use the speed locate feature?

How do you display all the items in a database that belong to two categories but not to a third category?

How do you display items that have empty date or number fields?

How do you find the most recently entered items in a database file?

How do you check for invalid data in a database?

Got Questions?

Database developers started asking the above questions almost as soon as they started using the Database, Phonebook, NoteTaker and WorldTime databases in the HP 100/200LX Palmtops. They noticed that as databases grew larger they also grew more lethargic. They realized that the more data they had to key into a database the more likely it was that they'd miss filling in a field or two and the more chances they'd have of entering invalid data.

Database developers discovered another problem. They could sort their databases by dates or numbers but then found that the speed locate feature failed to work properly.

We've Got Answers

These problems begot questions and, over time, the questions begot answers. Most of the answers involved a better understanding of the subset function in the Palmtop's database engine.

In this article we'll start at the bottom of the "subset learning curve" and describe what subsets are and what they're good for. Along the way we'll point out some subset features that should work but don't and conversely we'll mention some features that should not work but perversely do. Finally we'll look under the hood at the Subset Specification Language (SSL) and explore its powerful documented features and some of its quirky undocumented features.

Throughout the article, we'll use the GENERAL.GDB file, developed for the "Data-Basics" article as an Exemplary Database.

By the way, here are the quick and dirty answers to the questions asked above.

Use subsets and sort first on the left-most field.

Sort on a blank field; then sort on a number field.

Use the 'or', 'not and' SSL operators.

Use the !*Date or !*Number SSL commands.

Sort the primary field with None as the 1st sort item.

Use the SSL range operator ">".

If you deem these answers to be sufficient, you're way ahead of the rest of us. On the other hand, if the answers mean little or nothing to you, then it's time to go...

Up the Learning Curve

To start at the bottom of the subset learning curve, we'll describe what a subset is.

A subset is just what the name implies: a small part of all the items that make up a database.

The HP database engine extends the idea of a subset. In the Database, Phonebook, NoteTaker and WorldTime applications subsets may include not only a part of the database but all the items in the database. So the question arises, if you can have subsets that include all the items in a database, why bother? In other words what are subsets good for?

To get a better appreciation of the value of subsets consider the following.

Think of a database as if it were a spreadsheet. The data items would be the rows in a spreadsheet and the data fields would be the columns. In a spreadsheet, if you wanted to view the information in a different way you could move the columns around

Database: GENERAL All Database Items 24-JAN-99 11:55 am									
Text field	Category	Date Field	Ed	R	P	N	B	I	A
00 Text field sample. Te	GenInfo	05-JAN-99	✓			✓	✓		
Accommodating multiple	Technique	07-JAN-99	✓			✓			✓
Arithmetic Missing but	Technique	07-JAN-99	✓	✓					✓
Category field has the	Categ:Lim	07-JAN-99	✓			✓			✓
Changing Categories In	Categ	06-JAN-99	✓			✓			✓
Copy Note To Appt Todo	Clip	06-JAN-99	✓			✓			✓
Copying Phone Book entr	Clip;Tip	06-JAN-99	✓	✓					✓
Create Your Own ALT Sho	Tip	06-JAN-99	✓	✓					✓
Creating a blank copy o	Technique	06-JAN-99	✓			✓			✓
Customize The Fields In	Tip	06-JAN-99	✓			✓			✓
Database, PhoneBook, Wo	GenInfo	06-JAN-99	✓			✓			✓

Screen 1: The List View of the General Database

and delete or hide some of them. Similarly you could select a few rows from the spreadsheet and display them all by themselves on the screen.

However, with a spreadsheet, like Lotus 1-2-3, once you rearrange the data, there's no easy way to get back to the original layout. To do so you'd have to retrieve the original spreadsheet and thereby wipe out all your hard work.

With the database engine you can rearrange the columns or reduce the number of rows, or both, and save the layout as a "subset". To get back to the original view you simply press the F6 (subset) key, highlight the "All Database Items" subset and press Enter. There's no need to reload the whole database itself.

Once you've created and saved a subset, you can retrieve it just as quickly.

The important thing to realize is that subsets do not change the original information in a database. No matter how many columns you apparently delete, no matter how many rows you wind up with, you won't wipe out any data from the database.

In the same vein, if you press the Enter key on a selected row in a subset, you'll see that the Item View is the same as it is for the All Database Items subset. In other words, subsets do not alter the underlying structure of an item.

In short, subsets are a non-destructive way to rearrange the information in a database for your viewing pleasure. Since you can save subsets and call them up whenever you want, they can act as "information filters" to

let you examine parts of a database that are relevant to your needs. They do this by hiding the columns and/or rows that you don't want to see.

A Simple Example

Screen 1 shows the original List View of the GENERAL.GDB file.

Our goal is to show all the items (rows) in the database but we want to rearrange the columns so the Date Field column is on the left edge of the screen. Here's how to do this.

Press the F6 key to start the subset function and then press the F2 (Define) key. The Define subset screen will appear.

Immediately press F10 (OK) and you'll see the "Name" entry box. You could give the subset a unique name but you don't have to. Just press F10 to keep the "Unnamed subset" label and press F10 (OK) to return to the List View.

To rearrange the columns in the List View press the F8 (Column) key. Move the cursor to the Date column and use the F7 key to move it to the left side of the screen. Press F10 (Done) and you really are "Done". You've got a new way to view the data.

To sort the items by date press F7 and then press the 'D' key to set the Date field as the "1st sort field." Press Tab and the Spacebar to check the Ascending box and press F10 to return to the List View.

You can return to the original view by pressing F6 (subset) and selecting the All Database Items subset. When you want to have the data sorted by date, just press F6 and pick the Unnamed subset from the list and

press Enter or F10.

Suppose you want to review the last ten items you keyed into a database. Here's a subset that will let you do this.

Press F6 (Subset), press F2 (Define) and press F10 (Done). Name the subset "NaturalOrder" and press F10 twice Now press F7 (Sort) and make sure that all three sort fields have the word None in them. If necessary clear the Ascending check boxes. Press F10 (OK). The last items entered should be at the end of the list.

An Undocumented Non-Feature

Suppose you want to speed locate an item dated 08-JAN-99 using the Unnamed subset.

If you press the 0 key, the cursor will not move. However, when you press 8 the cursor will hop to the last item in the list.

It may come as a surprise that the speed locate feature does not work with date fields. Apparently it only works with text fields, note fields and categories. It doesn't work with dates, times and numbers.

This isn't a bug: it's a feature that should work but doesn't and the User's Manual doesn't say anything about it. I suppose we could call this an undocumented non-feature. The sidebar describes a clever way to make the speed locate feature work with date, number and time fields.

Rearranging columns may seem like a trivial use of the subset function but it turns out to be quite useful, especially if you have a Phonebook file with thousands of names and addresses.

In a Phonebook file all the fields are text-type fields so speed locate will always work. Simply move a chosen field to the first column in the List View and you're almost ready to use speed locate to find a Name, a Zip code or a City.

To make sure that speed locate really is speedy, sort the database in ascending order using the first column as the "1st sort field."

Speed locate will work even if the

data is sorted on some other field but you may have to wait for a second or two between keystrokes. On large databases the wait can grow to three or more agonizing seconds between keystrokes.

More and Different subsets

The previous example showed how to use a subset to view all the items in a database file. The only thing that changed was the arrangement of the columns in the List View.

Another use for the subset function is to limit the number of rows in a List View.

The purpose of this type of subset is to gather together items that have something in common so that you can look at just those items and filter out all the others.

Since there are fewer rows in this reduced item subset the speed locate and the search operations will work more quickly.

The simplest way to generate a reduced item type of subset is to use a category field in your database.

Screen 2 shows a partial list of the subsets for the GENERAL database. Most of these subsets were created using the different category options in the database.

Building subsets with categories makes sense. After all, when you "categorize" something you're limiting it in some way. So why not show the limited set of items that belong to the category?

The only thing wrong with this thinking is that, even though you can have up to 32 different category options in a database, you're limited to 16 subsets. The second sidebar for this article describes a way to get around this limitation.

It's easy to generate subsets based on category options. Here's how:

In the List View, press F6 (subset) and then press F2 to define a new subset. Use the tab key to move the cursor to the Category field in the Define Subset screen and press the Down Arrow key and select a category option with the spacebar. Press



Screen 2: Some of the subsets in the General Database

F10 and give the subset the same name as the Category. Press F10 twice to return to the List View and see what appears.

If you want a subset that combines the items in two or more categories just pick the second category option with the spacebar before you press F10. The database engine will add a comma between the category options. If you want to have a subset whose items belong both to one category AND another, just edit the line in the Category field and substitute an ampersand for a comma.

(The User's Manual says that a "semicolon separates multiple selections" but on the HP 200LX it is a comma rather than a semicolon.)

As an example of a multiple category subset for the GENERAL database you could define a subset that would look like "Add-on,Subset&Tip" which would generate a list of all items that belong to either the Add-on OR Subset AND Tip categories.

You can also create subsets using fields other than the Category field. For some examples of this variety of subsets, turn to the User's Manual. The section "Using Check Boxes and Options Buttons in a subset Definition" is quite good.

To use Text and Note fields to create subsets go to the Define subset screen and fill in a Text or Note field with the word or phrase for which you want a subset. For example, in the GENERAL database, you could type the words "tip,=Trap" in the Note field. Omit the quotes but keep the comma: it signifies that you want

items with tip OR Trap. The "=" sign signifies that you want the word "Trap" exactly as shown, i.e., case sensitive. Since "tip" doesn't have an equal sign the database engine will do a case-insensitive search for the word. If you want only those items in which the Note field contains both tip AND Trap use the phrase "tip&=Trap". The ampersand stands for the word AND.

If you do create a subset by putting "tip,=Trap" in the Note field you can expect to wait a looong time for the subset to appear after you press F10. The database engine has to search through all the Notes looking for "tip" or "Trap".

You can stop the subset creation process by pressing Ctrl+MENU (Break).

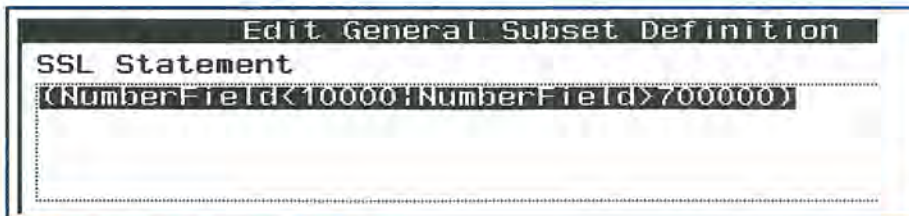
If you absolutely must have this type of subset here's a way to speed up the subset.

Suppose, for example, you want a subset that shows only those items in which the Note fields contain "tip" or "Trap".

Start by selecting the All Database Items subset and, in the List View, use the MENU File Modify command and add a new field to the database. Name the field "tiporTrap" and select "Check box" from the list of Field types.

Now create a temporary subset by putting "tip,=Trap" in the Note field and pressing F10. When the subset finally appears open each item and check the "tiporTrap" box for that item.

Finally press F6, highlight the temporary subset and press F4 to edit the definition. Delete the words "tip or



Screen 3: An SSL Statement is Generated Automatically

Trap" from the Note field and put a check mark in the new tiporTrap box. Press F10 twice and watch how quickly the subset appears. Of course this is cheating because you searched the database beforehand and checked the relevant items, but this corner-cutting method will make your database a lot faster.

Here's another way to create a subset using a field type other than a category field.

Suppose, in the GENERAL database, you want a subset of all items whose Number field is greater than or equal to 10000.0.

If you open the Define subset window and type ">=10000.0" (without quotes) in the Number field and press F10, you'll get an error message telling you that this is an "Invalid subset Definition". Apparently you have to use the statement ">10000,10000" to make this work. (This is another example of something that should work, but doesn't.) A better way to build this kind of subset is to use SSL, as we'll see.

Validating Data

Most database programs have a method to keep you from entering invalid data. For example, they can stop you from entering alphabetical characters in a ZIP code field.

The database engine in the Palmtop has a small amount of data trapping built in. For example, you can't put alphabet characters in a Number field. You can put alphabet characters in a Date field but the field will be cleared and the computer will beep if the entry is not something like 26-Jan-99.

Something the database won't do is prevent you from putting values in a number field that are "out of

bounds" for your particular application. Likewise, you could accidentally put alphabetic characters in a ZIP code field and the Palmtop will let you get away with it.

Similarly, you can omit entering data in a required field and the database will not stop you. Other database programs would force you to fill in a required field before you could continue.

Although the database engine doesn't stop you from making mistakes, the subset function can help you find and correct many data entry errors.

Here are a few examples.

Out of Range Values

Suppose, in the GENERAL database, we wanted to limit the values in the Number field to those greater than or equal to 10,000 and less than or equal to 700,000.

To clean up the data we want to create a list of all items that have a Number field value less than 10000 or greater than 700000. Here's how.

Press F6 (subset) and F2 to define a new subset. In the Number field of the Define subset screen type

<10000,>700000

and press F10 (OK) two or more times and you'll have a subset of items whose Number fields are outside the "valid" range. The values will be either less than 10000 OR greater than 700000.

Suppose we want to check for date values that are before (less than) 1/6/99 or after (greater than) 1/9/99.

If you enter <1/6/99,>1/9/99 in the Date field of the Define Subset screen and press F10 two or three times, you may or may not get the results you want. This subset definition will only work if the dates you

enter in the Define Subset screen match the date format selected in the Setup program. I'm not ready to call this a bug in the database engine, but it is a surprise.

The SSL Language

The Subset Specification Language (SSL) of the HP database engine is what drives the subset function.

To see what a typical SSL statement looks like we'll use the subset definition in which the Number field has <10000,>700000 in it. If you press F6(subset) and then press F4(Edit) you'll see the "Edit General subset Definition" window. In the SSL Statement field you should see (NumberField<10000 | NumberField >700000) as in Screen 3.

This is the SSL code that is generated automatically when you enter the expression in the Number field. The "|" (bar or pipe symbol) stands for the OR operator.

If you're not familiar with the Logical Operators (&, | and !, i.e. AND, OR, and NOT) think of them as being like the arithmetic operators "*", "+" and "-" (multiply, add, and negate).

(C/C++ programmers take note. Since these are logical operators, you'll probably want to use && and || instead of & and | which are the symbols for the bitwise AND and OR operators. Resist the temptation and go with the flow of SSL.)

The User's Manual refers to these operators as Boolean Operators since they only work with values of 0 and 1 (True and False). "Boolean" comes from the name of the founder of two-valued arithmetic, George Boole.

SSL also has a standard set of simple relational operators, namely >, <, = (greater than, less than, and equal to). It also supports the compound relational operators >=, <=, <> (greater than OR equal to, less than OR equal to, not equal to). However, these compound operators are not allowed in the Define subset screen. They only work in SSL statements.

Both kinds of relational operators

Define Subset

Text Field

Date Field Time Field

Number Field Category

General Subset Entry

SQL Statement

(Textfield#"tip"!Textfield="Trap")&(DateField={9-Jan-99})&(NumberField=123)&(Category#"Add-On")

Screen 4: Fill-in-the-blank vs. SSL coding.

Define Subset

Text field 0,1,2,3,4,5,6,7,8,9

Date

General Subset Entry

SSL Statement

(Textfield#"0"!Textfield#"1"!Textfield#"2"!Textfield#"3"!Textfield#"4"!Textfield#"5"!Textfield#"6"!Textfield#"7"!Textfield#"8"!Textfield#"9")

Number

Group

OK Cancel

Screen 5: Generated SSL can prevent a lot of typos

```
SSL Statement
1 (Z1PB"0"Z1PB"4"Z1PB"0"Z1PB"3"Z1PB"4"Z1PB"5
"Z1PB"6"Z1PB"7" Z1PB"8"Z1PB"9")A1(Z1P"")
```

Screen 6: SSL code to check ZIP codes.

compare two values and give the result of the operation as 0 or 1, i.e., false or true.

To see how relational operators work, take a look at the SSL statement above and imagine that the database engine is examining a Number field

that contains 707070.70. The engine evaluates the expression `NumberField < 10000` as false (0). It evaluates the second expression, `NumberField > 700000` as true (1). Then the OR operator takes over and evaluates `0 OR 1 = 1`, i.e. false OR true is true. Since the result is true, the item does indeed belong to this subset.

The relational operators in SQL have been extended (C++ folks use the term “overloaded”) to work with text, date and time values as well as numbers. You can compare a field to a value or you can compare two fields of the same type to each other. For example, if you’re building a database to track projects you could use an SQL statement such as {Begin Date}>{EndDate} to create a subset of all items that may have their date fields in the wrong order.

To complete the picture, SSL throws in a couple of extra operators: "`->`", "`#`", and "`*`". The first is a range or set operator; the second is a substring operator and the third is called a wildcard operator.

To see how the range operator

Overcoming the Subset Limit

The following tip is a workaround for the limit of sixteen subsets per database file. The tip assumes that your database contains a Note field and it relies on the fact that behind every subset there's a SSL statement.

Even if you create a subset from the Define subset screen, the database engine will generate the equivalent SQL statement in the background. You can view and edit the SQL statement by pressing the F2 (General) key in the Define subset screen.

THE TIP:

Look through the list of subsets and identify those that you use infrequently. When you find one, press the F4 (Edit) key and, if needed, press the F2 (General) key. Press Fn [.] (Copy) and then open Memo and paste the contents of the clipboard in an empty document. On a separate line in the document, describe the SSL statement, e.g., “subset of all who have met sales quota.” When you’ve gone through the list and copied the SSL statements to Memo, you can use the F7(Delete) key to remove those subsets from the list. Save the Memo document as

```

Full Screen Note
26-JAN-99 6:28 am
The following are some "extra" SQL statements that can be
copied and pasted into the "dummy" SQL General screen to
get around the limit of 16 subsets.

:This one will find empty number fields
l-Number field

:This finds Number fields that are either empty or 0
Number field=0

:These will find empty Time Fields
l(Time field#"a":Time field#"p")
l(Time field#"")

2:59 Save As Insert Clear Cancel OK

```

Use Memo or a Database Item to save eXtra subset definitions

C:\subsets.txt. In the database, select the All database items subset and press F10(OK) to return to the List View. Press F2 to add an item. Use a text field to label the item as "Xtra subsets". Press F3 twice to open the Note field and insert the file C:\subsets.txt into the Note field.

Anytime you want to use a "saved" subset, open the Xtra subsets item in the database, press F3 to open the Note field. Highlight and Copy the SSL statement. Close the Note field and press F6, F2, F2 and paste the SSL statement into an empty General subset Entry screen. Press F10(OK) twice to activate the subset.

If your database doesn't have a Note field, you can use the "subsets.txt" Memo file as your Xtra subsets repository.

Getting Speed Locate to Work with Dates and Numbers

Speed locate ordinarily lets you locate an item in a database by typing the first few characters of a selected field. However if the field contains numbers, dates or times, speed locate fails.

An unsatisfactory workaround for this is to store dates in a text field rather than a date field. The problem with this workaround is that when you sort the items using a text field you will wind up with 11/29/99 coming before 8/12/98 in the list.

The best solution is to keep dates in Date Fields but add a text field to the database. Use the MENU File Modify command and press F2 (Add). Call the field DateSort or whatever you wish and choose Text as the Field Type. Press ESC to cancel the Add field operation and, if you wish, resize the field to a minimum since it will always be empty. Press F10 (OK) to return to the List View. Press F7 (Sort) and use the DateSort field as the "1st sort item," and the DateField as the "2nd sort item." Check the Ascending box for both fields. Press F10 (Done). You should now be able to use the speed locate operation with dates. Expect that speed locate may be slightly slower than it usually is. The reason for the slowness is because the Date Field is not the 1st sort field.

A similar strategy will let you use speed locate on a Number field. You'll need to add a new Text field, NumSort. Be sure the Number field is located in the first column and use the NumSort field as the "1st sort field" and the Number field as the "2nd sort field." Make sure that both fields are sorted in Ascending order. (This clever trick was discovered by David Sargeant. Be sure to read David's column on page 11 to see what he does in his spare time.)

works, consider the SSL statement above. It looks for all items whose Number fields are outside the range 10000..700000. We could use the range operator to write an equivalent SSL statement:

```
!(NumberField->10000..700000)
```

Note the "!" (NOT operator) before the parenthesis. The expression would read "give me all items whose values are in this range: NOT" That is, if the expression inside the parentheses is true, the whole expression will become false. Likewise if the inner expression is false the outer expression will become true.

I don't recommend using the range operator for creating subsets. It seems to be slower than the equivalent expression using relational and logical operators.

You could key in SSL statements, but why bother! Use the fill-in-the-blank method. It's faster and there's

less chance to making typing mistakes.

Screen 4 shows a complicated subset definition screen and the equivalent SSL statement. Take your pick. Both types of subset definitions get the job done.

Here's another example. It assumes that you want to see only those items in which the Text field contains numbers. Screen 5 shows the text field filled with the ten digits separated by commas. It also shows the SSL statement generated by the database engine. The # sign stands for "contains. The code says, in effect "If the Textfield contains a "0" or if the Textfield contains a "1", or if.... the Textfield contains a "9" then the item belongs in the subset.

If it does nothing else, this example shows the advantage of letting the database engine do the coding. Moreover, the code can be quite useful in trapping a common error.

Suppose you've entered 500 or

more items to your Phonebook and you want to check that the phone numbers and Zip code contain only numbers and no other characters. Here's how to expedite this.

Highlight the SSL code above; copy it to the clipboard and paste it into Memo. In Memo use the F5 (Replace) key to replace all instances of "Textfield" with "Zip". Put ! (an exclamation mark, i.e. the NOT operator) before the opening parenthesis and add &!(ZIP="") at the end to eliminate any blank ZIP fields from the subset. Copy the new version of the SSL code to the clipboard and it into the General subset Entry box in your Phonebook and press F10 (OK) a couple of times to activate the subset. See Screen 6 for a picture of this code. Hopefully you'll wind up with an empty subset which shows that your Zip codes include only the digits 0 through 9.

The "*" operator is called a wild-card operator. The User's Manual and the Help screens for the subset function give a couple of examples of how to use it.

Detecting Empty Fields

When you're filling in items in a database it's only human to leave some fields empty and promise yourself that you'll come back later and fill them in. However, when the database has grown to hundreds or thousands of items, it's problematic that you'll catch all the records with empty fields.

The subset function can save a lot of time tracking down those items.

Here's a recipe for creating a subset of the items that have empty fields in your Phonebook.

Open your Phonebook and press F6 and F2 to define a new subset. In the Define subset press the Spacebar and the Enter key to put a space in each field. Then press the F2 key to look at the SSL code. It will contain a lot of statements like (Name#"") & (Business#"") etc. Highlight and copy all this code and paste it in Memo. Use the Replace key in Memo to change "&" to "|" and replace "#" with "=". Remove

any fields, along with their OR operator, that you don't care about such as (Address2="")|. Copy the modified code and paste it back in the General subset screen. Press F10 (OK) two or more times and you'll see how many items are missing important data.

Note the difference between the "#" operator and the "=" operator. In this case we wanted to find those fields that were "exactly" blank rather than those that might contain a blank somewhere in the text.

This recipe will work for the Phonebook since all the fields are text fields and the way to test for an empty field is with the SSL statement Fieldname="".

However the technique for finding empty number, date, and time fields is not documented in the User's Manual.

Without further ado, here is the SSL code that gets the job done.

To find items with empty date fields use the SSL code !*Date Field. For empty number fields use the code !*Number field (i.e., NOT wildcard field name). Note you can also use NumberField=0 but this will give you fields that contain a 0 as well as empty fields. For empty time fields use TimeField=":".

The use of the wildcard operator

with a field name is not supposed to work, but it does, at least for the date and number types of fields. The same trick fails to work for time fields so we resort to looking for time fields that do not contain a colon as in 12:34am. If you're using a time format such as HH,MM,SS you'll have to substitute a comma in place of the colon.

Speeding Up subsets with a System Macro

Once you've started using subsets to slice and dice your Database or Phonebook you'll wind up with a number of subsets that you use frequently.

You may also begin to notice that switching from one subset to another takes a long time. This delay happens the first time you switch subsets. Subsequent switches happen almost immediately.

The delay is caused by the database rebuilding the subset each time you open your Database or Phonebook.

To get over the hurdle of waiting for the subset to be rebuilt use a system macro that you run each time you open the Database or Phonebook. The macro would consist of a series of expressions like:

```
{F6}{F10}{F6}{Down}{F10}{F6}  
{Down}{F10}{F6}{Down}{F10}
```

and so on for as many subsets as there are in the database. Rather than wait around, run the macro and leave your Palmtop alone until the task is done. From then on you should be able to use the subsets quickly.

Two Final Speed Up Strategies

There are two "must have" programs that will speed up databases: FASTDB.TSR and DBVIEW.EXE. Both of these programs were mentioned in the Data-Basics article on page 14.

Fastdb.tsr will make editing your databases much faster. Once you've completed a database, the DBView program will let you view it without having to wait for subsets to be rebuilt each time you want to use the database.

In this article we've covered a lot of the tips, traps and techniques of using the Palmtop's Subset function and its SSL language. In the process we hope that we've answered most of the questions that you may have as you continue to use the database applications in your Palmtop. ■

A Database About the HP Palmtop's Database

The database file used throughout this and the next several articles is called GENERAL.GDB and is available on this issue's *The HP Palmtop Paper ON DISK* as well as on the Web at www.palmtoppaper.com/downloads.htm. Enter GENERAL in the search field and click Fetch! The file is about 110K bytes in size and contains a wealth of information. Much of the information in the file has appeared before in the pages of *The HP Palmtop Paper*. About 10% of it is new. Be sure to get a copy of the database. That way you can play along as you read this article.

To construct the database, I began by looking at the HP Palmtop's "User's Manual" on the 1999 CD InfoBase..

I searched for and bookmarked the relevant sections of the electronic User's Manual that dealt with the "Database", "PhoneBook", "Notetaker" and "WorldTime."

After reviewing what was in the User's Manual, I used

the CD InfoBase to do a complete search on the words "database", "phone", and "notetaker" and came up with almost 800 citations including everything from passing references to complete articles on the database applications. I also referred to my own databases called BTIPS and QTIPS, and found about 40 or so tips dealing with the database apps.

It was a bit overwhelming and left me scratching my head: how to present this information without making it a re-hash of the User's Manual.

It took about two hours to decide on the layout of an exemplary database file and create it. It took several days to organize the information that would go in the database and another day or two to develop and test eight new tips. In the end, I had a database with over 60 data items all of which pertain to the same topic.

••• BASIC TIPS •••

Unless otherwise noted, the Basic Tips are by Ed Keefe.

General

Resetting the Palmtop

If your HP Palmtop freezes or locks up here is a set of keyboard options to use to remedy the situation. The options are given in the order of least risky to potentially dangerous. Try each of them in the order given.

1. Press CTRL + MENU or CTRL + C (Break), several times to see if that will unfreeze a non-responding program.

2. Sometimes pressing CTRL + Z once or twice will end a program that is waiting for a response.

3. Press and hold CTRL + ALT and then press DEL to do a "warm boot".

4. If the warm boot doesn't stop the misbehaving program press CTRL + Left Shift + ON (a "cold boot") and answer NO to the question about reformatting the C: drive.

Do NOT answer yes otherwise you will lose all the information on the C: drive.

Finally, if the cold boot does not work (and in seven years of experimenting with the Palmtop I've never had an occasion when it didn't) you may need to remove the batteries. If you do this, remove the backup battery first then remove the AA cells. If you leave the backup battery in place it will maintain the state of the machine until it eventually dies which is probably not what you want to have happen.

An Aid to Memory

If you've never had to do a "cold reboot" on the Palmtop you probably won't recall the reset keystrokes when you really need them.

Here's a memory aid you can use. Use a copy machine to duplicate this page and cut out the following box.

**CTRL + Left Shift + ON
Answer NO and press Enter**

Tape the small reminder to the inside of the battery cover on the Palmtop. Hopefully, if you decide to pull the batteries, this note will jog your memory and save you from wasting your C: drive.

HP CALC

Roots of Numbers in CALC

You can find cube roots, fourth roots, etc. in the following way. Put the HP calculator in Math mode with Menu Applications Math. This will expose the LN, e^x , LOG, and 10^x functions. To take the 5th root of a number, for example, all you have to do is divide the LN of the number by 5 and then do the e^x function. This would work exactly the same with the LOG and 10^x functions. A simpler way is to realize that the cube root of a number is simply the number raised to the "one-third" power. That is, the cube root of 27 is $27^{(1/3)}$. If you're using RPN, the keystrokes would be 27 Enter, 1 Enter, 3 /, \wedge . The answer is 3.00. Likewise the fourth root of a number is $\text{Number}^{(1/4)}$ and so on.

Stan Dobrowski — 76711,2302

Help in FILER

Most people know that pressing the [F1] function key, in FILER, opens a Help screen. Unlike context-sensitive help screens the HP Palmtop uses a combination of hypertext and function keys to access the Help you want.

On the Palmtops, hypertext appears as words surrounded with boxed borders. When you press an arrow key or the Tab or Shift+Tab keys a highlight hops from one hypertext word to another. If you press the [ENTER] key you will get more Help on the highlighted word.

You may also navigate through the Help screens with function keys. For example in FILER, when you press the [F1] function key twice,

you'll get an Index of all FILER's features. The screen is almost entirely hypertext. Press the arrow keys to skip from one word or phrase to another. When you press the [ENTER] key, the text will change to Help on a specific topic.

The [F8] function key will return you to the previous screen. Either the [F9] function key or the [ESC] key will "Cancel" the Help function entirely. You can use the [F6] and [F7] function keys or the PageUp or PageDown keys to move through the Help screens that have more than one page of content.

To try this out start FILER and press the [F1] function key twice to open the Index screen.

Press the [TAB] key repeatedly until the word "Filter" is highlighted. Then press the [ENTER] key. The "Displaying Matching Files" screen will appear. It tells you that you can press [MENU] O F (Options Filter) to open the "Show Only" box where you can type in a "filter", e.g. *.wk1 and press the [F10] (OK) function key to "lock in" the filter. (See the MS-DOS Tip below for an explanation of wildcards and how to use them.)

Using FILER's Filter Feature

Start FILER and go to the C:_DAT directory (If needed, press [ESC] until C:*.* is displayed in the top right corner of the screen. If you find yourself in the "Available Drives" screen, highlight [-C-] and press [ENTER]. Then highlight _DAT and press [ENTER]).

Press the [MENU] Options keys and observe that the word "Filter" is the first option in the pull-down menu. Also note that the "hot-key" for this operation is [F4]. At this point you can press either F, [F4] or [ENTER] to open the "Filter" box. Type in *.wk1 and press [ENTER]. FILER will show only those files with

continued on page 32

... QUICK TIPS ...

All Quick Tips are by Ed Keefe unless otherwise noted.

XLATE

Converting Database files to Notetaker files

XLATE, is part of the HP 200LX Connectivity Pack. This program is the best tool for those who want to import or export files into the HP databases.

The latest version of this program (1.02) can work with custom database files: something the earlier version could not do.

Two freeware programs, GDBIO and GDBUTIL will do much of what XLATE will do. GDBIO can't handle Note fields in the databases. XLATE on the other hand adds the ability to merge or synchronize files as well as translate them. Like other conversion programs, XLATE may fail to translate large Note fields. It seems to truncate Notes that are larger than 2400 bytes in length.

For example, if you want to export an HP database file for use in DataPerfect or dBASE you would start by converting the HP database file into a Comma Delimited Format (CDF) file. You could do this on the Palmtop with the Smart-Clip function and then print the file to disk.

The XLATE program will do the same thing but faster and with less chance of making a mistake. XLATE will add the "," (quote, comma, quote) characters in all the right places for you. It will also put a pair of quotes around words that already have quotes and strip off the quotes when it imports a CDF file. It will not put quotes around numbers, dates or times.

Hopefully the target database program will have a way to import the CDF file.

The database applications in the HP Palmtop cannot import CDF files. For this you need a program like XLATE or GDBLOAD. (GDBLOAD is part of the GDBUTIL package. Several users have found that GDBLOAD

will not handle files larger than 200K bytes.)

As an example of how to use XLATE, we'll describe how to convert a Database file to a NoteTaker file.

XLATE will not convert a Database file to a NoteTaker file directly. It does so indirectly using a two-step process.

To demonstrate the process we'll use a modified Phone Book file like the one shown in Screen 1.

(Tip in a Tip: To modify a Phone Book file, for example TEST.PDB, rename the file as TEST.GDB and open the file in the Database program. Therein use the MENU, File, Modify file (MENU F F) command and add, delete, and rename fields as you wish. For example, we added a date field called "Last Contact" and rearranged and resized some of the other fields. When you're ready, press F10 (OK) and quit the Database program. To open the file in the Phone Book application, just rename TEST.GDB to TEST.PDB.)

Since the Cpack's XLATE program won't work with modified Phone Book files, we'll just rename the file as TEST.GDB and use this as our file.

We want to extract the Name, Note and Category fields from TEST.GDB and put only this information in a NoteTaker file called TEST.NDB.

Here's the procedure to follow:

1.) Create an empty NoteTaker file by opening the NoteTaker program and using the MENU, File, New command. Call the file TEST.NDB and then exit from the program.

2.) Within Cpack, start the XLATE/ Merge program.

3.) Press the F2 function key to open the Add dialog window.

4.) Select Translate from the Task buttons and Database from File Type group (Screen 2).

5.) (Optional) Type XLATE GDB

to CDF in the description field.

6.) Press F8 to bring up the "Settings: Translate Database" dialog window.

7.) Press TAB to select the Target field in the File Format box. Press the up arrow key so that "CDF Files" appears. (Leave the Source category field as it is.)

8.) Press F5 to set the source and use the file picker to find and choose the TEST.GDB file.

9.) Press F6 and use the file picker to select a drive and directory for the CDF file. Then press ALT+N and give it the name TEST.CDF.

10.) (Optional) Press F7 and use the file picker to choose a suitable directory for a Log file. Name the file TEST.LOG. (A log file will save any error messages so you can trouble shoot the translation process later.)

11.) Press F8 to open the Field Mapping dialog box. Leave the Name field as it is. Highlight the word "Title" and press the F7 key to Remap the field. Select <unmap> from the list of field numbers. Press Enter. Do the same for all the other fields except the Category and Notes fields. Highlight the "Category" word and press F7 to remap this to Field 3 (Screen 3). Select "Notes" and remap this to Field 2.

12.) Press Enter several times to return to the XLATE/Merge opening screen. Press F6 to run the translation.

The Field Mapping function is XLATE's way to mimic the Smart-Clip feature of the database programs.

To bring TEST.CDF into the NoteTaker file, repeat steps 3-11 above. This time use Notetaker as the "File Type" and key in "XLATE CDF to NDB" in the description field. In the "Settings" window make the File Formats "CD Files" and "HP 100/200LX". Use the F5 and F6 keys to specify the Source as TEST.CDF and the Target file as TEST.NDB. The Mappings don't need to be changed.

Database:TEST		Data Item		01/03/99 6:31 am					
Name Goldstein,Hal		Title							
Category Business		LastContact		12/15/1998					
Phone: Bus 1-800-373-6114		Home		515-472-1887					
Email hal@thaddeus.com		Fax		515 472-1879					
Company Thaddeus Computing, Inc.									
Address1 110 North Court Street									
Address2									
City Fairfield		State IA		Zip 52556					
Note CIS:75300,2443									
Help F1	Add F2	Note F3	Find F4	Clip F5	Prev F6	Next F7	F8	Cancel F9	Done F10

XLate/Merge: FILETRAN.\$TM 01/03/99 6:15 am

Task Type Description

Translate Database XLATE GDB to CDF

Task

- ☒ Translate
- ☐ Merge
- ☐ Synchronize

File Type

- ☐ Appt Book
- ☐ Phone Book
- ☒ Database
- ☐ Notetaker
- ☐ Pocket Quicken

Settings...

OK

Cancel

Description XLATE GDB to CDF

Help F4 Task F2 File Type F3 Description F4 Settings F5 OK F6 Cancel F7 F40 F0

Xlate/Merge: FILETRAN.STM 01/03/99 6:16 am

Task Type Description

Edit

Settings: Translate - Database

File Formats Source: C:\BAKLX\A\DB\TEST.GDB

Source: C:\BAKLX\A\DB\TEST.CDF

Field Mapping

Source Fields: Target Fields:

Name Field 3

Title

Category

LastContact

Bus

Home

Remap... OK

Defaults Cancel

OK

Cancel

Help F1 F2 F3 F4 F5 F6 Remap F7 Default F8 Cancel F9 OK F10

Press the F10 key to return to the starting screen of the XLATE program, and press the F6 function key to Run the translation. If an error message "File not found" appears, it means that the translator could not find the TEST.NDB file that should have been created in Step 1 above.

When you quit the XLATE application, it will ask if you want to save the setup. Answer Yes. The setup can serve as a reminder of how to use this somewhat confusing program.

If you decide to use XLATE on a regular basis to perform a group of translations, you can build each translation once and then press the F4 function key to Run All of them as a "batch" process.

common entries plus your 200 unique entries and the 200 unique entries from your partner's Phonebook.

XLATE's Merge operation let's you specify whether you want to perform the process interactively by telling the program to stop each time it detects an item that has some fields that are the same and some that are different. You can also perform the process quickly and tell the program to give either your file or your partner's file priority in resolving any differences. Later you can look at a log of conflicts and resolve any differences that remain.

The XLATE/Merge application will also let you Synchronize two Database, Phone Book, Quicken or Appointment Book files. This means that both you and your partner would wind up with identical PhoneBook files.

I have not used the Synchronize option since it's just as easy to merge two files into one and then use Filer's Copy command to make a duplicate of the master file.

Database

Using Notetaker to Display Database files

If you have a number of databases and/or Phonebooks that you want to open at the same time, you have a couple of options.

One option is to use Software Carousel to create multiple System Manager sessions and open different databases in different SC sessions.

The latest version of Software Carousel (ver 7.07) prevents you from opening the same Database or Phone Book file in more than one session. This restriction eliminates one of the major causes of corrupted database files.

It is possible to open two Phone Book files or two Database files in one System Manager session. For example, you could open two database files, e.g., DB1.GDB and DB2.GDB, by using the MENU File Rename command to give DB2.GDB the file named DB2.PDB. Once

you've done that you can open DB2 with the Phone Book and DB1 with the general Database program.

If you want to keep your Phone Book file and two database files open at the same time, there's even a way to do that.

You can use NoteTaker to open a second .GDB file. However, this trick takes a little more effort. It's not as simple as renaming a file.

Use the utility program GDB2NDB by Jorge Trevino (Csi 72540,620) to convert a .GDB file to a NoteTaker file and you'll be able to open a second database file in NoteTaker and still keep your Phone Book file open.

The easiest way to do this is to put the GDB2NDB.COM file, along with a copy of the DEBUG.EXE program (from the D:\DOS directory on the Palmtop), in the same directory as your database file. The DOS command to use is

GDB2NDB DBName

Do not add the .GDB extension to DBName. Press Enter and the conversion will be done. You'll end up with a file called DBName.NDB which you can open in NoteTaker.

The upside is that you can now use the System Manager clipboard to copy and paste from one database file to another without having to close one file and open the other.

GDB2NDB is the second in a matched pair of programs. The flip side to GDB2NDB is the program called NDB2GDB. Jorge created the pair of programs so he could convert a NoteTaker file to a database file with NDB2GDB. He could then open a NoteTaker file in the Database application and use the command [MENU], File, Modify and add a date field to his NoteTaker file. He used the GDB2NDB program to change the modified file back to a NoteTaker file that contained a new date field.

For the purposes of this tip you only need the GDB2NDB program. However, you'll want to keep the other program handy just in case you

want to modify the structure of your "expanded" NoteTaker file.

WorldTime

Using WorldTime to Display Database Files

The WorldTime application is another instance of the database engine in the HP 200LX. The application is designed to use only one data file, WORLD.WDB. There is no command in the application to open another data file.

Here's a way to get a general database to appear in the WorldTime application. It's a tip best suited for database power users and "hackers".

To make this tip work, you'll need a hex editor (DEBUG will do in a pinch).

If the WorldTime application is open, close it.

In Filer, go to the C:_DAT directory and Move (F3) the WORLD.WDB and WORLD.ENV files to any other directory to make room for the new WORLD.WDB file.

Pick any Database file and copy it to the C:_DAT directory and rename it to WORLD.WDB.

Use the hex editor to change byte 000C in the renamed WORLD.WDB file from the letter 'D' to the letter 'W' (hex 57) and save the file.

If you're using DEBUG, type the following commands and press Enter after each one. This will change the character at location 000C (010C in DEBUG format) to a 'W'.

```
DEBUG WORLD.WDB
-e 10c 57
-w
-q
```

Start the WorldTime application and press F9 to get beyond the "Welcome" screen. The database file will appear.

You won't be able to change the on-screen appearance of the file and you'll have to live with the limited File commands. The highlight bar will blink once a minute and there's no Data Card. However, you will be able

to copy and paste to another System Manager application. You can scroll through the list, use subsets, view the data items and perform searches.

Can you use this "hack" to change WORLD.WDB to a Database amenable file? NO! I changed the 12th byte of the default WORLD.WDB file from W to D and tried loading the file into the Database application. This promptly produced a "Divide Overflow" error and a hard crash.

On *The HP Palmtop Paper ON DISK*, we'll include a couple of batch files and Debug script files that will make the process of converting Database files to NoteTaker files and/or WorldTime files a little easier.

Freeware mentioned in this article

NDB2GDB/GDB2NDB — available on the 1999 CD InfoBase from Thaddeus Computing, Inc. and in the HPHAND forum of CompuServe. (Freeware, 1994)

D2W.ZIP — (contains batch files related to the Quick Tips in this issue.) Freeware available on this issue's *The HP Palmtop Paper ON DISK*.

Commercial products mentioned in this article

HP Connectivity Pack for the HP 200LX — available from Hewlett-Packard and from Thaddeus Computing, Inc.; 110 No. Court Fairfield, IA, 52556, Email orders@thaddeus.com or online at www.PalmtopPaper.com

Software Carousel v.7.07 — available from Thaddeus Computing, Inc.

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Software on The HP Palmtop Paper ON DISK

March/April 1999

You can find all the software described in this issue at www.palmtop.net/super.html which is now sponsored by our Web site www.PalmtopPaper.com.

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BASIC TIPS *continued from page 28*

a .WK1 extension. The "*" (asterisk) is called a "wildcard" because it can stand for any combination of letters and/or numbers.

If the list is empty, it means that there are no such files in this directory. The highlighter will be on the "View Up" line.

Press [ENTER] to return to the C:\ (root) directory.

If there are no files with *.WK1 in

this directory the list will be empty and you'll be stuck.

To get back to the _DAT directory you'll have to press the [F5] (Goto) function key and type _DAT in the Goto box and press [ENTER] or [F10].

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