

# THE Portable Paper

## Issue # 36: Final Issue of *The Portable Paper*

### New Company Formed By Former Personalized Software Employees Will Support HP110, Portable Plus, and HP150 Computers

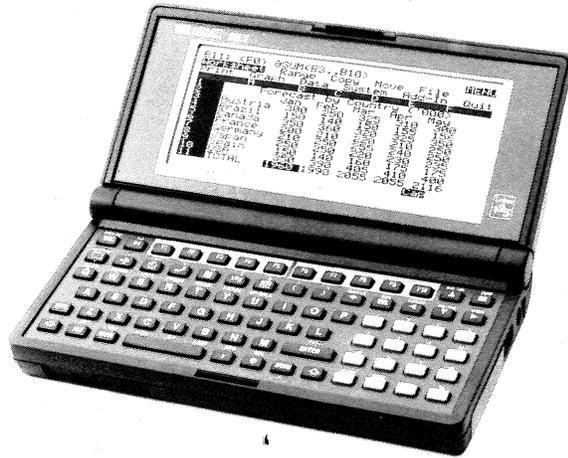
(See page 14)

---

<b>Publisher's Message</b> .....	1	<b>Durability of the HP Portables</b> .....	12
<b>Letters</b>		<b>I/O Design</b> .....	12
User Likes DIET110 .....	2	<b>Current Notebooks: Who are the Heavyweights?</b> .....	13
Thanks for your support; keep some ROM stock! ..	2	Most Powerful .....	13
Translating ECM files to HP 95LX PHONE format ..	2	Best Overall Value .....	13
<b>110%</b>		Most Durable .....	13
Transferring Files Between		Best Keyboard .....	13
The HP 110 and The HP 95LX .....	3	Elegance and Prestige .....	13
Portable Navigator on the HP110 and Portable Plus	4	Longest Battery Life .....	13
CompuServe HP Systems Forum for HP Portables	4	Best Video Display .....	14
Message Boards .....	5	Best Small Package .....	14
Libraries .....	5	<b>News from Personalized Software</b>	
Conference Rooms .....	5	Good News for HP Portable/HP150 Users! .....	14
Accessing the HP Systems Forum .....	6	<i>The Palmtop Paper</i> Well Received by Subscribers .....	15
Using CompuServe with your HP110/P.PLUS ..	7	<b>Portable Profiles</b>	
Designing the HP110 and Portable Plus .....	7	Putting an Application on ROM, and Other Notes ..	16
CPU .....	8	<b>Through The Looking Glass</b>	
PPU and Battery .....	8	The Final Product .....	18
Battery Choice .....	9	Let's Stay in Touch .....	19
Power Supply .....	9	<b>The Savvy User</b>	
Plug-in Memory .....	10	Transferring Files to HP Portables Via CrossTalk .....	19
Self-Test .....	10	In Closing .....	20

**ATTENTION:**

# Owners of the new HP 95LX Palmtop



Call 800-373-6114 to get your **FREE ISSUE** of *The Palmtop Paper*, the newsletter devoted exclusively to users of the HP 95LX Palmtop PC.

Here are some of the things you'll learn by subscribing to *The Palmtop Paper*:

1. Complete information on new 95LX-related software and hardware products from HP and third-party vendors.
2. Tips and in-depth articles on how to make the best use of the HP 95LX's built-in software.
3. Information on which existing MS-DOS software can be made to run on this 40-column by 16-row palmtop.
4. How to select and use the best portable printers and modems for the HP 95LX.
5. How to transfer files efficiently between your HP 95LX and a PC, Mac, or main-frame computer.
6. How to use your HP 95LX as a pager.
7. All about flash ROM and higher-capacity RAM cards, as they become available.
8. How to use the built-in infrared interface.
9. How to transfer information between the built-in editor, Lotus 1-2-3, the appointment book, phone book, and financial calculator.
10. Techniques for getting around the limitations of the HP 95LX's small screen and keyboard.
11. How to make maximum use of the 95LX's limited file space.
12. ...and much, much more.

## Extra bonus — **FREE Subscriber Disk**

As an extra bonus, each year's subscription to *The Palmtop Paper* comes with a free copy of our Subscriber Disk for that year, packed with valuable software programs specifically selected for the HP 95LX, including: ■ Compression programs so you can fit more files on your Palmtop ■ Games ■ Utilities to make your 95LX more productive ■ Lotus templates and macros written specifically for the 95LX ■ More.

### Portable Paper Subscribers

Even if you don't have an HP 95LX, if you want to take a look at our new publication, give us a CALL at (800) 373-6114, or FAX us your request at (515) 472-1879. We'll send you a free issue.



**Personalized  
Software INC.**

A DIVISION OF THADDEUS COMPUTING, INC.

*Products that make HP computers smarter*

P.O. Box 869, Fairfield, IA 52556 (515)472-6330 FAX:(515)472-1879

# PUBLISHER'S MESSAGE



Hal Goldstein

As usual I waited until the last minute to write this 36th and last Publisher's Message for *The Portable Paper*. This time, for once, I am without words ... but something must be expressed.

Some of you have been with us for six years, since the first issue. You have seen your HP Portable go from being a state-of-the-art industry leader to a misunderstood, no-longer-manufactured, curiosity.

The fact that we, the HP Portable users, always had something new to say, issue after issue of *The Portable Paper*, is a real testimonial to the brilliance of the design and to the usefulness of the machine. Hundreds of you contributed to the 1,500 pages of HP Portable knowledge expressed in 36 issues over 6 years. Thanks to each one of you.

I feel fortunate to be on the forefront again of a new computer technology with the HP 95LX Palmtop. I have spoken to some of you who are not so enthusiastic about the HP 95LX because of its small keyboard. All I can say is that I use it constantly. Having a fully PC-compatible computer with Lotus 1-2-3 in my pocket has proven incredibly useful to me. I find the keyboard acceptable for notes, to-do lists, phone numbers, calculations, and games.

I invite any reader of *The Portable Paper*, past or present, to call us at (800) 373-6114 or (515) 472-6330 and request a copy of our first issue of *The Palmtop Paper* at no charge, whether or not you own an HP 95LX. As you turn the pages, you'll see quite a few parallels between the HP Portables and the HP Palmtop.

Finally, some good news for HP Portable users. Brian Teitzman, our Director of Sales, and Larry Baldozier, our Director of Operations will be starting their own company, CLASSIC COMPUTERS, to take over Personalized Software's HP Portable and HP150 business. Brian and Larry will be there to fulfill many of your HP Portable needs. Please see "News From Personalized Software," page 14, for more information on this.

What more is there to say but that I wish you success in all your material and spiritual aspirations.

FOR HANDY REFERENCE: Items *directly* relevant to the three HP Portables are denoted in this issue as follows:

**110** 110 Portable **P+** Portable Plus **PV** Portable Vectra **LS/12** Vectra LS/12

When items are *partly* or *indirectly* relevant they are denoted as:

**110** 110 Portable **P+** Portable Plus **PV** Portable Vectra **LS/12** Vectra LS/12

## THE PORTABLE PAPER Volume six / Number six November / December 1991

### Editor/Publisher

Hal Goldstein

### Managing Editor

Richard Hall

### Department Editors

Tom Page

Ed Keefe

### Contributing Editors

Larry Baldozier

Ted Dickens

Rita Goldstein

Ron Taber

Brian Teitzman

### Copy Editor

Glen Frank

### Art Consultant

George Foster

### Circulation

Margaret Martin

Marni White

Mindi Bass

### Executive Advisor

Rita Goldstein

The Portable Paper (ISSN-0886-9138) is published bimonthly by Personalized Software, a division of Thaddeus Computing, Inc. at 57 East Broadway Avenue, Fairfield, IA 52556. Thirty-six issues of The Portable Paper were published from 1986 through December, 1991. For information on back issues please contact Thaddeus Computing, Inc. at the address below.

Please allow four to six weeks for receipt of back issues. Executive, Editorial, Circulation, and Advertising Offices: P.O. Box 869, Fairfield, IA 52556. Telephone: (515)472-6330, FAX: (515)472-1879. (c) Copyright 1991, Personalized Software, all rights reserved. No part of this publication may be reproduced without written permission. Reasonable efforts are made to provide accurate and useful information, but the reader must make his or her own investigations and decisions; the Publisher and Editorial Staff cannot assume any responsibility or liability for the use of information contained herein.

**POSTMASTER:** Send any address changes to Personalized Software, Attn: *The Portable Paper*, P.O. Box 869, Fairfield, IA 52556.

# LETTERS

## User Likes DIET110

**110** Well, this will be my final letter to the *Portable Paper*. I'm sorry that it is going to end. It's helped me over the past few years and I will miss it.

**P+** I just wanted to share my thoughts about one way to get more out of the limited RAM/EDISK capacity of the HP Portables. I think all portable computers should have at least one file compressor program among their utilities. These compressors come in many different types.

**PV** One type creates archives by combining many separate files into a single compact file that is easily sent/received via modem and facilitates keeping the file set together on disk. PKZIP is this type of program. It is commonly used to keep document, program, and associated files together on distribution disks.

**LS/12** Another type allocates part of the disk space as a "virtual disk" and sets up a system to intercept reads and writes so that everything stored there is compressed when stored and decompressed when retrieved. Squish Plus is an example of this type of compression program. In effect, this type increases the amount of disk space available by as much as 50%, depending on the types of files stored; text, spreadsheets, and small batch files compress well, program files generally do not.

Perhaps the first file compression program developed was one to compress individual files. While the original file compressors were only able to compress text files, more recent programs will also compress program files, and allow them to remain executable in compressed form. Articles in *The Portable Paper* have mentioned several of these and Personalized Software has distributed a number of them on its Subscriber Disks, and various other disks. Of those, I like DIET110 best (from the Keefe Kollection). DIET110 offers several advantages over the others I have seen. In my personal order of importance, those advantages are:

2. It is a small program (10K).
3. It compresses both .EXE and .COM files.
4. It produces compact output files which require less RAM overhead to run. (For example, one executable file compressed to 16K with DIET and 60K with SCRUNCH, another file compression program.)
5. It is fast. (It is much faster than SCRUNCH when compressing a file and loading.)
6. It can also compress other types of files.

As if these weren't enough, DIET110 has two other very significant advantages that I have not seen in other programs of this type:

1. It accepts the DOS wildcards (\* or ?).
2. It can restore (decompress) the files it compresses.

It's important to note that I am talking about DIET110, the smaller version of DIET distributed with The Keefe Kollection. The regular DIET is a larger program which includes a TSR routine to compress and expand text files without user intervention.

I encourage individuals to include DIET among their utility tools. I would also encourage Personalized Software to use this program when compressing program files for distribution since it requires less RAM overhead than alternative programs and allows the user the option of decompressing the file and using the original when minimum program load time (or absolute minimum RAM overhead) is desired.

Thanks again for a whole lot of useful information over the years.

**William J. Pinnick**  
**Chem-micro-Metrics**  
**1689 Scarborough Road**  
**Greenville, NC 27858**

## Thanks for your support; keep some ROM stock!

**110** Thank you, all the people who have helped get out my views over the years. I feel like a child whose parents are divorcing; it's something I can't alter, but I still feel sad.

**P+** Even though the company is getting out of supporting the Portables, I

hope someone on the staff will fill the need I have — to keep the machines I have left functioning.

I also hope that you keep ROM software in stock until December. I want to buy a number of the items.

Finally, I want to give my thanks to the editorial team which produced *The Portable Paper* and helped explain what the HP Portables were all about.

I still hope I will not lose complete contact with the people I have met from Utah over the years.

**Jack Ross**  
**3 Bray Street**  
**Mosman 2088**  
**Australia**

*[We're happy to announce that two of our most experienced personnel, Brian Teitzman, Director of Sales, and Larry Baldozier, Director of Operations, will be starting their own company, Classic Computers, and taking over Personalized Software's HP Portable and HP150 business. For more information see the ad on the back page and the announcement in "News from Personalized Software," page 14 in this issue — Rich.]*

## Translating ECM files to HP 95LX PHONE format

**P+** Thank you very much for sending me the Translate Utility for the HP 95LX. I intended to use the Translate Utility to make my Portable Plus's Executive Card Manager files readable for the PHONE application on my HP 95LX, but I was not successful. I shall describe what I did, and perhaps you could help me.

With "copy cardfile/transfer out" I translated my phonebook file (about 400 names, numbers, addresses, etc.) from ECM into a holding file in the BASIC format. In this format, ECM writes the phonebook information into an ASCII file of quoted strings. According to the table on page 4-9 of the Connectivity Pack User's Guide, this is the format that the Translate Utility needs. But when I run the Translate Utility on my desktop PC and attempt to translate the file, the process progresses to nearly 100% completion, and then I get the message: "Cannot process source file: Invalid file format, press ESC to continue." The Translate Utility is working, I have successfully translated an LX-phonebook file to CD1 format, and back. What did I do wrong?

Before you sent me the Translate Utility, I tried to solve the problem with Lotus and the Copy and Paste Utility on the 95LX. I imported the ECM BASIC holding file into Lotus on my desktop and placed the fields in such a way that they could fit in the 95LX PHONE application. Then on the 95LX, I transported the information from the holding file to the Phonebook program using the Copy and Paste functions (the inter-program macro function on the 95LX was

indispensable for this process). This seemed to fill the fields up with extra spaces and my Phonebook file grew to more than 60K (the maximum size file PHONE can handle). I had to split the resulting file in three, which was not a very satisfactory solution. I don't seem to be able to remove the extra spaces without making the file unreadable by PHONE. Can you help me? Thanks very much in advance.

**Johan van Arnhemstraat**  
**Rozendaal, Holland**

*[Some programs attach an End-Of-File marker when they produce an output file. To fix this, start MEMO and open the DC1 file. Page down to the end of the file. There you should find some special characters after the last record. These will look like one or more horizontal arrows. Press <DEL> to remove these characters and save the file. Use the Translate Utility on the file again. With the EOF markers gone, the translation should complete successfully — Rich.]*

# 110%

## Making More of Your HP Portable

by Hal Goldstein

### Transferring Files Between The HP 110 and The HP 95LX

By Ron Taber

*[Thanks to Ron of Hewlett Packard technical support for this information — Rich.]*

**110** Transferring files between the HP 95LX Palmtop PC and the HP 110 Portable is a relatively simple thing to do. The hardware needed is as follows:

- HP 8222A Serial Cable.
- A male gender changer that swaps pins 2-3 and 5-7. Pins 2 and 3 are transmit and receive. Pins 5 and 7 are signal ground. (You can use the 25-pin adapter cable that comes with the 8222A Serial cable and the HP 9221M HP Portable modem cable.)

### CONFIGURING THE COMPUTERS

#### Configuring the HP 110

1. Select **TERMINAL** and press either **ENTER** or **F1** to start the application.
2. Press **ENTER** to select the default configuration.
3. Press **F5** for Terminal Config and select the following options.

Comment:	Leave blank
Logon String:	Leave blank
Phone Number:	Leave blank
HandShake:	NONE

Xmit Pacing:	NONE
EOL Sequence:	CR
Parity:	NONE
Recv Pacing:	NONE
Parity Check:	OFF
Device:	Serial
Baud Rate:	19200
Data Bits:	8
Echo:	OFF

4. Store these values in a file by pressing **F2** (Store File).
5. Press **F8** to exit the configuration menu.

#### Configuring the HP 95LX

1. Press the **COMM** key.
2. Press **MENU**, **Settings**, **Config**, **Port**, **Baud**, **6** (for 19,200), **Quit**, and **Save**. Enter **HP110** when asked to "Save current settings as:"

With the settings saved as HP110, you can call them up automatically whenever you want to transfer files between the HP 110 and the 95LX. To do this from **COMM**, press **MENU**, **Settings**, and **Use**. Then enter **HP110**, or move the highlight bar to **HP110.DCF**, and press **ENTER**. **COMM** is now configured.

### TRANSFERRING A FILE FROM THE HP 95LX TO THE HP 110

#### IMPORTANT NOTE!!!

Always start the file transfer process on the HP 110 first.

On the HP 110

1. Press **F4** (Download Config).
2. Configure the download file as:

From Remote File: leave blank  
 To Local File: filename to be stored in 110  
 File Type: 8-bit Text  
 Remote Invocation: leave blank  
 Protocols: On  
 Command Options: leave blank  
 Overwrite Permission: On

3. Press **F8** to exit the configure menu.
4. Press **F1** (Connect). The HP 110 should beep and display CONNECTED in the lower left corner.
5. Press the **System** key. This returns the softkeys to the display.
6. Press **F1** (From Host).

On the HP 95LX

1. From COMM press **MENU**, **Transfer**, **Xmodem**, and **Send**. Now select the file to send to the HP 110. The XMODEM file transfer program in the HP 95LX does require a small amount of time to establish the connection.

**TRANSFERRING A FILE FROM THE HP 110 TO THE HP 95LX**

On the HP110

1. Press **F3** (Upload Config) and set the options as follows.

From Local File: filename you wish to send  
 To Remote File: leave blank  
 File Type: 8-bit Text  
 Remote Invocation: leave blank  
 Protocols: On  
 Command Options: leave blank

2. Press **F8** to exit the configuration menu.
3. Press **F3** (To Host).

On the HP 95LX

1. Press **MENU**, **Transfer**, **Xmodem**, and **Receive**. Then type in the filename you wish to receive from the HP 110.
2. Wait: when the retry indicator reaches **5** the two computers will be synchronized and the file will start transferring.

**Portable Navigator on the HP110 and Portable Plus**

**110 P+** Graham Collins, of Effective Solutions Ltd in the United Kingdom, informed us that the version of Portable Navigator he is developing for the HP 95LX was first developed, and works on the HP110 and Portable Plus. It's never been sold for those machines, but Graham promises to complete the documentation if enough 110 or Portable Plus users are interested.

Portable Navigator is a real-time navigation package that can interface to the Navistar DECCA or LORAN navigational receivers for use on board small vessels. It features Ghasht plotting, log files, real-time tidal atlas, waypoint management, and speed and course-made-good calculations.

If you are interested, please contact Graham directly at ESL in the United Kingdom (phone: 44-344-874103, fax: 44-344-872612). If interest warrants, ESL will quote a price and delivery date.

**The CompuServe HP Systems Forum for the HP Portables**

*The HPSYS CompuServe Forum provides HP Portable users with a wealth of support and product information.*

*By Ted Dickens,  
 HP Forum Sysop, CompuServe # [76701,272]  
 Introduction by Hal Goldstein, CompuServe # [72257,714]*

**INTRODUCTION**

**110 P+ PV LS/12** Those of us who used the HP Portables (and now the HP Palmtop) in our daily activity are pioneers of sorts. We have all suffered trying to make some piece of software or hardware conform to our will. Our reward has been a new set of tools that make our everyday activities more effective and powerful. The investment of time in learning computer technology has given us a significant competitive advantage over those who are not computer literate.

I feel the same can be said about electronic networks such as CompuServe. If you are willing to tolerate the expense and the initial bit of frustration in learning a new tool, you will be rewarded in many ways.

Participation in CompuServe forums means access to a whole new world of useful knowledge. It provides an opportunity to "meet" people in all walks of life with whom you would never come in contact. Furthermore, CompuServe is great fun.

In particular the HP110/Portable Plus section (section 5) of the HPSYSTEMS forum is one of the only sources available for responses to your HP Portable questions.

In the past years hundreds of HP Portable users have frequented the Forum's message area and contributed interesting insights, tidbits, firmly held opinions, and in-depth technical discoveries. You can eavesdrop and "download" (copy to your computer) those messages and files of interest to you. However, the fun of CompuServe is participating and sharing information and ideas.

Expect a reasonable learning curve and to make a few mistakes "online" — no one minds much — we've all been there. The HP Forum SYSOP — the individual who is in charge of the forum — Ted Dickens, is excellent. He'll help you with any initial problems using the forum. (If you have the new HP 95LX, Ted is an excellent resource. He is an extraordinarily knowledgeable and active 95LX user with lots of answers to your 95LX questions.)

You can talk to me on CompuServe — my ID number is 72257,714.

### **GETTING STARTED: WHY THE HP FORUM?**

The HP Forums on CompuServe have two goals — to allow users to talk to each other and to augment HP's support mechanisms.

In other words, it's a user's group. Only there are no meetings to attend and all communication is done electronically. Each of the more than 10,000 HP forum members gets to tailor this user's group to his or her individual needs.

The forum is a great place to get questions answered, keep up with the latest information from HP and other vendors, get software updates, and tap into the wealth of public domain and shareware software for your HP product. (The HP110 and Portable Plus are just two of many HP products covered in the HP Forums.) And unlike HP's support channels, the HP Forums are open 24 hours a day, seven days a week.

If you have used an electronic bulletin board system (BBS), most of the forum concepts will be familiar. Each forum has three main areas:

- Message boards, where you can read and write messages;
- Libraries, where you can find files and download them to your system;
- Conference rooms, where you can "meet" on-line with other users and talk interactively.

In practice, HP110 and HP Portable Plus users will find the HP Portable library the most useful resource.

### **MESSAGE BOARDS**

Instead of one big message board, each forum is divided into sections; each section is devoted to a single

topic. The sidebar lists all of the sections for each of the HP Forums. Of particular interest to *The Portable Paper* readers: The HP110/Portable Plus section (number 5) of the HP Systems forum.

Activity in the HP Portable section of the HPSYS forum has declined as the product has matured. But the forum remains a good place to get your HP110 and Portable Plus questions answered. There are enough experts frequenting HPSYS that even the most arcane questions can usually be handled.

One of the things that sets a CompuServe forum message section apart from a typical BBS is that forum messages are "threaded." When you ask a question and I send a reply, my reply is automatically linked to your question. Reply to my reply and the "thread" gets longer. If several people reply to your message, all of those replies (and replies to those replies) are added to the thread. Not only does this make it simple to read all of the related messages in the proper order, it is easy to pick out and read only the threads that look interesting.

### **LIBRARIES**

Each section has a corresponding library where you can find application notes, product announcements, software upgrades, answers to frequently asked questions, public domain and shareware utilities, captured "threads" on interesting topics, and more. All told, there are about 61 files in Library 5, the HP110/Portable Plus section.

Each file is accompanied by a one line title, a paragraph or two of description, and a list of key words to help you decide which files are of interest.

The files for the HP Portables are many and include a wide variety of information. (See the box in next column for more on content of Library 5.)

### **CONFERENCE ROOMS**

Electronic conferences offer you a chance to "talk" to special guests. In the past year, forum members have met with HP lab, support, and marketing groups including several memorable conferences with the chief architect of HP's NewWave. Conferences are also held on related topics, such as the conference on PCMCIA memory cards (used in the HP 95LX).

### **WHAT IS COMPUSERVE?**

The CompuServe Information Service (CIS) is a public-access computer system that provides information services. The breadth of information available from CIS is staggering. There are 1400 different information services. No matter what your personal or professional interests may be — there is something on CIS that you will find valuable.

CIS forums cover the full range of hardware, software, and even "paperware" (magazines). Besides the forums for HP, you'll find forums for IBM, Apple,

Microsoft, Lotus, Borland, Novell, and more. In the HP Systems Forum you'll not only find coverage for the HP110/Portable Plus, but many other HP products including the HP 95LX Palmtop. In the *Palmtops* forum, you'll also find Casio, Sharp, Poqet, Traveling Software... All told, there are more than 200 computer companies active on CompuServe.

## ACCESSING THE HP SYSTEMS FORUM

If you already have a CompuServe account, you can access the HP Systems Forum by typing GO HPSYS. If you don't have a CompuServe account, you can obtain a free Introductory Membership. Call 800-848-8199, ask for representative #231. International users can call the non-800 number in the U.S. (614-457-0802) or one of the numbers listed below. The Introductory Membership comes with a manual, instructions for getting signed on, and \$15 of free connect time.

Country	Toll free	Normal
United Kingdom	0800 289 378	(+44) 272 255 111
Germany	0130 37 32	(+49) 89-66550-111
Switzerland	155 31 79	
Japan	0120-22-1200	03-3221-7363
Australia	008-02-5240	(+61) 02-411-8603
New Zealand	0800-44-6113	

## STRATEGIES

CompuServe is not a free service. The basic U.S. connect rates are \$6.00/hour up to 300 baud, \$12.50/hour up to 2400 baud, and \$22.50/hour up to 9600 baud.

However, using some very simple strategies can keep your monthly bill down — and the value up.

The first strategy is to decide how you are going to use CIS. Do you just want answers to your questions, or do you want to keep up with what's going on in the field? If the former, you only need to log on when you have a question. For the latter, you will need to log on at least once a week. (Messages are kept in a first-in, -first-out queue; messages disappear after about a week.)

The second strategy is to choose your baud rate carefully. If you are going to log on interactively, consider 300 baud. That's roughly 300 words per minute which most of us can read comfortably. Use the faster rates only if you are going to be downloading files or using an automated access program. (More on that in a bit.) In fact, while you are learning to use CIS, 300-baud is ideal. The \$15 usage credit in the introductory membership will pay for 2.5 hours of access at 300 baud. That's enough to learn your way around.

The third strategy is to be selective. In each forum you can select sections of interest. CIS will then only show you messages from those sections. Further, you can "scan headers" and only read interesting "threads."

The final strategy is to use an automated access program. These are programs written specifically to access CIS. These programs (Autosig and Tapcis for the PC, Navigator for the Mac) have different user interfaces but share an underlying design philosophy: Do it

## Contents of HP Systems Forum Library 5: HP110/Portable Plus

These are the HP110/Portable Plus-related files in CompuServe's HPSYS Forum, Library 5 as of October 1, 1991. Log on to CompuServe and type GO HPSYS. Then select Library 5. To obtain a free Introductory Membership to CompuServe, call 800-848-8199 and ask for representative #231.

Filesize = size of file in kilobytes;

FILENAME.EXT	Filesize	File description
PCRUN.ARC	7	Run PC-compatible programs on the P.Plus
DNLPP.HLP	8	How to download from CIS to P.Plus
FUEL.COM	0	Display P.Plus battery level from DOS
PPTERM.TXT	9	Documentation for PPTERM.COM
PPDRV.DOC	4	Run 1-2-3,2.01 & Symphony 1.2 on P.Plus
POKRPP.ARC	19	Las Vegas poker slot machine for P.Plus
ROMDOC.TXT	21	How to program EPROMs for the P.Plus
HPIL.HLP	2	Introduction to the P.Plus HP-IL ToolKit
PPTERM.DBG	25	DEBUG script to create PPTERM.COM
PRTTRM.ARC	32	Terminal program for the P.Plus
HPILST.ARC	25	Tricks & tips on using the HP-IL card in a PC
KERM110.ARC	14	KERMIT 1.3: Datacomm program for Portable
TM.ARC	34	Time Management program for the Portable
HPCALC.ARC	54	Nifty calculator program for the P.Plus
PACK.COM	1	Pack (un-fragment)the Portables Edisc
PLSLOT.COM	10	Slot machine game for the P.Plus
HP110.BUG	27	Unofficial list of P.Plus bugs/anomalies
PPROM.ARC	33	Developing ROMs for the P.Plus
PPTRM2.ARC	6	PPTERM: Datacomm program for P.Plus
STUFF.ARC	3	Stuff keystrokes in the key buffer
CAL.ARC	7	Calendar program for P.Plus
PPRLE.COM	1	View RLE graphic files on the P.Plus
GAUGE.ARC	1	Battery 'fuel gauge' program for HP Portable
KERM110.ARC	33	KERMIT 2.29: Datacomm program for Portable
KEY.ARC	5	Utility to redefine softkeys on the P.Plus
FAQ004.DOC	7	Frequent Questions about TERM program
PORTSW.TXT	2	List of Portable/P.Plus software avail from HP
PPLUS.SET	20	P.Plus driver for 1-2-3v2.01/Symphony v1.2
CEN110.APP	2	Interfacing centronics printer with HP 110
TETPLU.ZIP	18	TETRIS for the HP P.Plus
9114PS.DOC	3	An AC power supply for the 9114 disk drive
POSLOT.COM	11	Slot machine game for the Portable
EMACPP.ARC	42	EMACS editor for the P.Plus
MISCP.L.ARC	2	Collection of utilities for the P.Plus
FAQ017.DOC	13	Frequent Questions on Device Configuration
TJETCT.ARC	4	TSR for P.Plus to control ThinkJet
PORTPR.TXT	16	Advantages of portable computers
HPIL.DOC	20	Documentation for the P.Plus HP-IL ToolKit
PDL30.ARC	17	Updated HPIL.SYS Driver w/ reconfig options
APBURN.COM	1	Program to burn EPROMs w/Aprotek
MSCPLU.ARC	3	Turn on/off the P.Plus internal modem
PPCAL.ARC	9	Turbo Pascal Calendar program for Plus/110
PPHST2.ARC	17	Command line editor/history utility for P.Plus
FONE.ARC	13	Command files for Reflections and P.Plus
SPS110.COM	17	Generate 15 spirograph images on Portable
HPINFO.ARC	12	Utility to convert Infocom games for Plus/110
VU110.EXE	12	View MacPaint files on the Portable
FKSTD.ARC	1	Utility to initialize f-keys on HP100 and Plus
HPILMN.BIN	2	Part of the P.Plus HP-IL ToolKit
PP16.ARC	2	Replacement INT16 Keyboard BIOS for Plus w/source
MMM.ZIP	12	Useful front end for Memo Maker on P.Plus
PPLUSW.DOC	1	Documentation for PLUS.WPD
PPT2SR.COM	12	PPTerm 2 Source Code
READID.ASM	1	Subroutine to read the Portables serial number
FONE.ZIP	16	Batch file for WR&O's Reflection on P.Plus
PPLUS.WPD	3	WordPerfect 5.0 graphics driver for the Plus
EDBAT.ZIP	11	Integrating editor and spell checker with PKZIP
LIF110.TXT	2	Read/Write HP LIF disks on a 110!
KERMPL.DOC	5	Documentation for KERMP.L.ZIP
KERMPL.ZIP	75	Kermit v3.10 for the HP110 and P.Plus
KRM110.ZIP	135	Kermit 3.10 for HP P.Plus & HP110

off-line. With Autosig (ATO for short), the program logs on to CIS, visits each of the forums I use, downloads all the new messages — then logs off. And it does this at the full speed of the modem. Then I read the messages and compose my replies off-line. When I'm done, ATO logs back on to upload my messages. The difference is dramatic. Instead of me being on-line for an hour reading and writing messages, ATO does the same work in a few minutes of connect time. Unfortunately, these programs don't run on an HP110 or Portable Plus — you need a PC compatible.

### USING COMPUSERVE WITH YOUR HP110 AND PORTABLE PLUS

Through the years we have run a number of articles about the specifics of using CompuServe with the HP110 and Portable Plus. If you have past issues, look up "CompuServe" in the 1986-1990 index to *The Portable Paper*. The following references appear in the index. Note that the volume number is listed first, followed by the issue number and the page number. So 1:1-5 indicates the first volume, first issue, page 5:

[*CompuServe*, 1:1-1, 1:4-29, 3:1-29; *AutoLogon*, 1:4-5, 2:2-11, 4:3-43; *Automate Functions*, 3:5-9; *CIS A Protocol*, 5:3-13; *EasyPlex*, 1:4-5, 3:1-32; *Email*, 1:1-4, 3:1-32; *HP Forum*, 1:1-5, 1:4-2, 3:1-30, 3:2-42, 3:2-43, 3:3-5, 5:5-34; *IBMAPP Fourm*, 5:6-40; *IBMSYS Forum*, 5:3-6, 5:6-34.

### SUMMARY

Whether you need to access years of collective wisdom about the HP110 and Portable Plus, get an answer to a specific question, or keep abreast of the latest information, the HP Forums on CompuServe offer something to every HP Portable user. Joining is easy and in no time at all, you'll be a CIS veteran. While CIS is not free, by using some simple strategies, you can get the most for your money.

Besides being a great source of information, the forums are also just plain fun. There are some real characters on the Forum, and not all of them ASCII. In the midst of a discussion on why some of the 95LX's make faint clicking noises when running on batteries, we had some highly imaginative explanations — including "little green men who get in through the door on the card slot."

Try it out!

[*Ted Dickens writes PC software for Niche Designs Corporation. He became a forum user in 1984, was "demoted" (Ted's comment) to Sysop in 1987, and has spent the last two years in a room with a PC, modem, and fluffy white walls — Hal.*]



### THE PRACTICE FORUM: Learning on CompuServe's Nickel

Make your introductory membership credit last even longer by using the GO PRACTICE command to get into the Practice Forum. Not only will you find a "Sysops" (knowledgeable person in charge of the forum) who specialize in helping new users, you find lots of files of tips and tricks — and it's all free to any user. While you are in the Practice Forum, CompuServe suspends the normal connect charges. So you can learn to read and write messages, upload and download files all without paying for it.

(Overseas users, beware. Network charges are not suspended. In much of North America and some international sites, network charges are only 30 cents/hour. But for other places, the network charges can be significant.)

#### Section names

HP Systems Forum	HP Peripherals Forum
1 General	1 General
2 DOS related	2 Mass Storage
3 Vectra	3 PAL Utilities
4 HP150/Touchscreen	4 LaserJet
5 HP110/Portable+	5 DeskJet
6 Analytical	6 PaintJet
7 Networking	7 ScanJet & FAX
10 NewWave	8 FAX products
11 HP Applications	9 HPs for Apples
12 Minis	10 Other peripherals
13 Handhelds	11 3rd party products
14 95LX Palmtop	15 Direct-Connect API

## The Designing of the HP110 and Portable Plus

[The following material is based on an article written in the HP Journal in July, 1986. Even non-technical readers may find much of this article fascinating. The discussion reveals not the particulars of the HP110 and Portable Plus design, but why some of the design decisions were made. Some of the material, especially on battery life, may be a little out-of-date. However, when you consider the original HP110 was designed in 1982 and 1983, one can see how advanced HP designers were in their thinking — Hal.]

Putting all the components for a complete personal computer into a box the size of a notebook is not a trivial task, but necessary for the design of a portable system. It also requires that the circuitry consume the minimum amount of power possible to conserve battery

life. CMOS circuitry was used throughout the HP110 and the Portable Plus computers to achieve this goal. The hardware system (please see figure next column) is designed around a CMOS version of the 80C86 microprocessor that was developed by Harris Semiconductor.

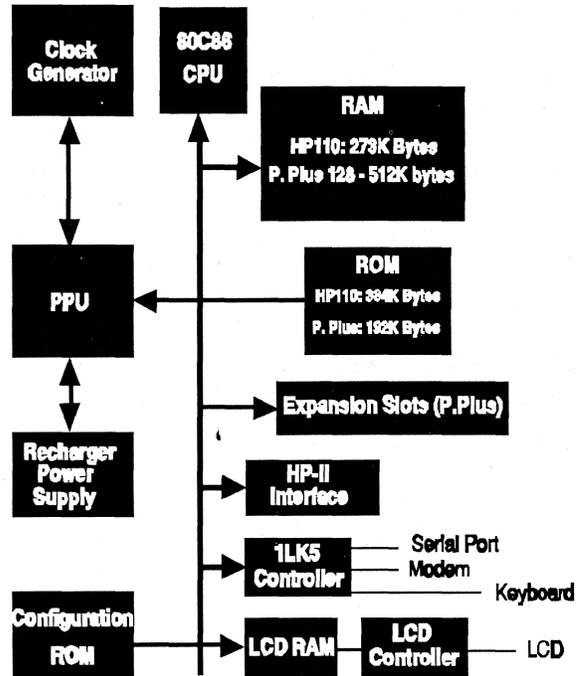
The HP110 contains 272K bytes of CMOS static RAM and 384K bytes of ROM. The Portable Plus contains less memory in the base unit (128K bytes of RAM and 192K bytes of ROM), but is currently expandable via plug-in RAM or ROM cards to 1.28MB of RAM or 1.5MB of ROM.

The Portable Plus is designed for software compatibility with the HP110 and to accommodate plug-in expansion. Systems RAM starts in memory space at address 00000<sub>16</sub> and grows upward. Display memory begins at address 80000<sub>16</sub>, and the system ROMs reside in the upper addresses. A 256K swap space is used to swap in a pair of one MB application ROMs completely when needed. The I/O space allocation of built-in devices is compatible with the HP110. The 32K of I/O space not used in the HP110 is used in the Portable Plus for its plug-in drawers.

**CPU**

The 80C86 processor operates at a 5.33 MHz clock rate, which is about 12% faster than the processors used in the original personal computers. This, combined with the increased efficiency of the 80C86 16-bit bus, lets the HP110 and the Portable Plus operate almost twice as fast as the standard 8088-based computer. The 5.33 MHz clock rate was chosen to provide increased processing power in addition to saving precious printer circuit board area. The 82C84A clock generator and a 74HC393 dual binary counter form the clock generator circuit. The 82C84A uses a 16 MHz crystal to create a 5.33 MHz (33% duty cycle) clock for the 80C86 and a 2.67 MHz output clocks a counter in the 74HC393, creating 1, 2, 4, and 8 MHz signals. To use all of the available space, the unused half of the 74HC393 is pressed into service as a counter for wait state insertion. In the HP110, the lower 512K bytes of memory space are allocated to system RAM, and run with no wait states. I/O devices requiring longer access times have one wait state to pull the open drain ready line low to insert additional 80C86 wait states.

The current drawn by the 80C86 is low compared to an NMOS part, but is still too high to leave running all the time. The HP110 and the Portable Plus contain a second microcomputer called the peripheral processor unit (PPU) that controls the system when the 80C86 is turned off. This processor (an MC146805) typically draws 1% of the current of the main processor and is left running all the time.



Block diagram of the hardware system for the HP 110 and Portable Plus

**PPU AND BATTERY SUPPLY**

The peripheral processor unit actually operates the computer because it controls the switches that power the rest of the system. The PPU contains a timer that is used to provide a real-time clock for the system. It also provides for time-zone conversions and alarms. Because it has a clock and controls the power, the PPU can wake the system up at a predetermined time to run an MS DOS program and, when finished, it can then put the computer back to sleep. It monitors all the interrupt lines so that if an interrupt occurs while the main CPU is turned off, it can power up the CPU to service the interrupt. For example, the computer can be awakened by an incoming telephone call and can be programmed to answer it.

A fuel gauge value that represents the percentage of charge left in the battery is computed by the PPU using configuration data supplied by the main CPU and then displayed in the main menu screen of the computer's built-in Personal Applications Manager. The PPU knows what sections of the computer are active and drawing current. It also receives a signal from the charging circuit that indicates when the battery is being charged. It uses this data to calculate the amount of charge available in the battery at any time. Although the accuracy of this value will decrease as the battery ages, the only other way to determine the charge of the battery is to measure terminal voltage, a method that would only give a result within 20% of the true value.

The PPU controls the charging circuit and can switch it into a low-charge-rate, or float, mode when the batteries are fully charged. This prevents battery damage if the computer is left plugged in constantly.

The battery charger is a current-limited, precision-voltage-regulated power supply. The output voltage is either 7V or 7.5V as selected by the PPU. As the battery nears full charge, it accepts less current. To speed up the final stage of charging, the charging voltage is switched from 7 to 7.5V for a period of time. This ensures each cell is fully charged. Thereafter, the supply remains at 7V as long as the charger is plugged in.

One of the characteristics of the sealed lead acid batteries used in HP's portable computers is that optimum battery life is achieved by charging them whenever possible, using a charging voltage of 2.32V to 2.35 volts per cell. (The Portable Plus should be discharged to 80% before recharging for optimal battery life.) The optimum voltage is temperature-dependent. Hence, the charger circuit is temperature-compensated to produce the optimum voltage over a temperature range of -20 C to +60 C.

After discharge, each battery cell is slightly overcharged as mentioned above to ensure cell equalization. The PPU tailors the overcharge cycle to match the depth of cell discharge. The charger control circuit also determines if there is a shorted cell (which can happen if the battery is excessively discharged). If so, the main charger is turned off to protect the regulator.

One weakness of a lead acid battery is that it can be discharged to significantly beyond its normal capacity. To prevent this, the power switch is operated by the PPU. The PPU monitors the battery voltage to see if the battery charge is too low to power the rest of the system. If so, it refuses to turn on the 80C86 CPU. This prevents the user from running the battery down to a level where it may sustain damage. In such a case, the batteries still have enough charge to preserve memory for more than a week so the user can continue with the same application and data immediately after connecting the charger supply.

A single wall-mounted transformer serves as both an AC adapter and a power supply for the charging circuitry. The switch from AC to battery power is all electronic, which gives the HP Portable computer family several advantages. If a user unplugs the transformer from the wall outlet (or if the power should fail), the computer instantly starts using its battery for power. Some portable computers use a mechanical switch in the charger plug and they lose power when this happens.

## BATTERY CHOICE

Choosing a battery for the HP Portables was a significant activity influenced by the state of battery technology at the time of design. Non-rechargeable batteries were rejected as a source because their life would be

intolerably short (7 to 13 weeks for alkaline D cells, depending on the number of cells used). The package is large enough to use batteries the size of D cells, however, so the choice was between three sealed lead acid cells or five nickel-cadmium (NiCd) cells. Size and weight per watt hour in the two chemistries are essentially the same. NiCd cells have several well-known problems: short lifetime of typically two years (the average data sheet is exceedingly optimistic), near impossibility of building an optimum charger, reduced lifetime caused by use of simple chargers, electrolyte leakage from dead cells, larger internal current leakage, and memory (the inability to produce large energy cycles after being repeatedly used in small energy cycles). These limitations of NiCd cells have been addressed somewhat since the HP Portables were designed, but still exist to some degree today.

Lead acid batteries suffer from none of these problems. On the other hand, lead acid batteries are often damaged, sometimes ruined if they are run into an over-discharged state. This is easily avoided with a low-battery cutout as discussed earlier. Finally, lead acid batteries are less expensive.

The low internal leakage of the lead acid batteries provides a margin of safety for the user's data which simply is not available with other simple portable power systems. At room temperature, a fully charged lead acid battery will maintain memory (without other use) for nearly a year. Even if the computer is run until the low-battery-charge cutoff algorithm turns it off (which leaves about 10% of the battery charge), the memory will typically be maintained for a month at room temperature. Even at elevated temperatures, the lead acid battery has a relatively low self-discharge rate. At a constant temperature of 50 C, a fully charged battery will maintain memory for over four months. By comparison, a fully charged NiCd battery with no load at all will self-discharge at room temperature in about three months.

## POWER SUPPLY

Since the battery supply selected always exceeds 5V and most of the electronics uses a regulated 5V, a simple linear regulator is used for the power supply. Regulators that were commercially available when the HP110 was designed used a few milliamperes internally even under no-load conditions. It makes little sense to design a computer that only requires 0.25 mA in sleep mode if the regulator requires 2 mA at the same time. Newer regulator ICs have since been introduced that draw only about 50 A, which is more acceptable. The no-load current of the custom regulator in the HP110 is 12 A for the feedback resistors (which you also need for the new IC regulators), and 3 A internally in the regulator.

The display needs a -7V to -12V regulated supply that can be varied under control of the PPU. This was

done with a feedforward, inverting regulating converter, an approach not commonly used for regulation. Unless a lot of second-order effects are considered in the design, the load regulation is poor. In this case, since the display looks like a constant resistance, the load regulation is not so important and supply stability is easily obtained since there is no feedback. The contrast ratio of the LCD screen is adjusted by varying the negative voltage. The supply design provides an output voltage that is constant to well within 1% over the range of the input voltage (5.5V to 7.5V) and to within 2% over a load current variation of at least 5%.

### **LCD CONTROLLER**

A custom IC to control the liquid-crystal display was designed for both the HP110 and the Portable Plus. Two factors drove the decision to design a custom chip in the 110. First, no existing controllers were available that were compatible with the 80C86 bus. The additional circuitry needed to integrate them into the system would have been too expensive in terms of printed circuit board space. Second, the only controllers available were in surface-mount packages while all other chips in the 110 are in dual in-line packages (DIPs). Adding a major manufacturing step for one component was undesirable.

An LCD presents design constraints not seen with CRT displays. Primarily, the LCD is a truly digital display—it has neither horizontal nor vertical blanking periods that allow for CPU access of display RAM. The data flows to the display in an uninterrupted stream. Access to display RAM has to be controlled so that the LCD controller always has priority while the CPU sees the display RAM as a normal segment of its address space.

### **KEYBOARD CONTROLLER**

The keyboard controller was especially designed for the needs of the HP110 and Portable Plus. It has a built-in sleep mode that lets it watch the keyboard for any key strike while consuming far less than a milliwatt of power. The keyboard controller can wake up the system with an interrupt and then read the keyboard to see what key is pressed. This allows the system to be started with the touch of a key. The keyboard controller does not scan the matrix by strobing every line individually, but rather strobes all the rows at once and then all the columns. The rows are strobed low and the columns read to see if a key is pressed and then the columns are strobed high and the rows are read. This method will detect any key closure on the matrix, but consumes very little power until a key is struck.

### **PLUG-IN MEMORY IN THE PORTABLE PLUS**

The HP110 is configured with over 250K of RAM and 384K of ROM. One of the chief design goals of the

Portable Plus was to increase this capacity while giving the user the ability to customize the machine's configuration. To do this, the Portable Plus is designed with two plug-in memory slots.

These drawer slots provide a means for customizing the hardware configuration according to the specific needs of the various sectors of the computer marketplace. The documented open architecture of the Portable Plus gives independent hardware vendors easy access to the machine, opening opportunities for market expansion beyond those Hewlett-Packard formally pursued. The second general enhancement made possible by the drawer slots is the ability to expand the basic functionality of the machine. Both RAM and ROM can be added to the Portable Plus through these slots.

The ability to expand the basic functionality of a machine is especially important when designing a product that is at the leading edge of packaging technology. The physical constraints imposed by the packaging density of integrated circuitry (especially memory) result in a product whose basic functionality may be marginal in some applications. Expansion drawers provide an opportunity for improving this functionality and can help prolong the life of a product.

The Portable Plus was introduced with a RAM drawer and a ROM drawer. The RAM drawer is delivered from the factory with 128K of CMOS static RAM, but is expandable to 384K in 128K-byte increments. From the user's point of view, this additional RAM works the same as the RAM built into the Portable Plus.

The ROM drawer provides a means for the user to add ROM-based software to the computer. This drawer has a storage capacity of 1.5 MB and supports up to twelve ROMs. Applications software can be designed to execute directly out of ROM, or it can be downloaded into RAM before execution, as in typical disk-based packages.

Coupled to the plug-in board space issue is the method of identifying and configuring the plug-in cards. The goal is to make the plug-ins autoconfigurable, so that all the user has to do is install them. The board area limitations shifted this responsibility from hardware to memory management software. The mainframe provides a sixteen-word region in I/O space for each plug-in. In this area, each plug-in has a card identification register and a configuration register. This allows software to determine system resources and configure them accordingly. To ease hardware and software designs, plug-in RAM increases are constrained to 128K increments.

### **SELF-TEST**

Manufacturing and serviceability are important issues in the design of any product. In the Portable Plus, much effort was put into the development of a built-in self-test. This is useful in isolating failing components

in the factory and the field. It is available to customers and can be used by them to determine whether their unit needs service. It is also useful to dealers and service centers that install optional accessories such as modems, software drawers, and memory drawers. The self-test can be used to verify that the optional hardware is properly installed before giving the unit to the customer.

The tests are accessed by turning the computer off and then pressing the **Shift**, **Extend char**, and **f8** keys simultaneously. This causes the computer to boot into the self-test code instead of PAM. The test code is part of the firmware stored in ROM in the machine. It consists of a number of different tests and each test checks a different block of circuitry in the unit. These include an LCD test, a timer test, an RS0232-C/V.24 test, a modem test, a ROM test, a RAM test, and a software/memory drawer test.

A displayed menu indicates the tests available and warns the user of the length of time required to run the RAM test and the RAM portion of the software/-memory drawer test. The user presses the appropriate softkeys and the **Shift** key to select any single test or all tests in sequence.

When a failure is found, a message is displayed indicating the assembly and reference designator of the failing part. If no failure is found, the message **-ok** is displayed when the test is completed. Pass/fail messages are also sent to a ThinkJet Printer if one is connected via the HP-IB port. This feature proved useful during the QA evaluation phase of the product's development. Units were placed in an environmental chamber and subjected to extremes of temperature and humidity while running the built-in self-test. Each computer was connected to a printer outside the chamber and the pass/fail information was recorded.

Since the tests are available to customers, they must run without any external test equipment. This requirement diminishes the coverage of the RS-232-C/V.24 and modem tests, since the interfaces to the RS-232-C line and telephone line cannot be checked without some form of plug-in test equipment. For this reason, the built-in tests are not used by HP factory and service facilities to test the RS-232-C port and the optional built-in modem. Instead, another set of tests is used that requires plug-in test equipment and provides a more comprehensive check of these two sections.

Self-test code should require a minimum number of working components in the system to run. Although there are 28 LSI circuits in the Portable Plus, only five are needed to run the built-in self-tests.

## MECHANICAL DESIGN

The HP110 and Portable Plus are modular computers. The main computer is a completely self-contained package with disk drives and printers available in their own separate packages. This allows the portable

computer to reduce the system weight by taking only the components that are needed on a particular trip. Since most of the fragile mechanical devices are excluded from the main system, the portable can be designed to withstand a much more hostile environment.

Portability and durability were the major design considerations throughout the mechanical development of the HP110 and Portable Plus. The printed circuit boards were laid out in parallel with the plastic parts being designed to ensure maximum space efficiency. The system board in the 110 fits into the bottom case, component side down, and the stiffening ribs on the bottom case are placed around the ICs. This cooperation between printed circuit and mechanical design helped keep the product height low. Keeping the height to a minimum was also a factor in choosing the keyboard design. The final selection uses a low-profile switch that has 75% of the travel of a standard key switch.

The clamshell design not only provides portability, but also protects both the keyboard and display from the hazards of transportation. A carrying case is included instead of a built-in handle. The carrying case has a shoulder strap which is often more convenient than a handle, and the handle on the carrying case is padded for comfort.

Manufacturability, along with mechanical integrity, was a strong consideration in the mechanical design of both products. In the HP110, the printed circuit boards are made to mount into the bottom case, stacked onto hollow studs with spacers to keep the leads from shorting. The assembly consists of the bottom case, the system printed circuit board (component side down), a set of spacers, a copper shield for EMI (electromagnetic interference) and ESD (electrostatic discharge) protection, another set of spacers, the I/O board (component side up), and finally a set of nuts to clamp the assembly together.

The display assembly consists of two plastic parts that snap together to form the housing around the display, the arms that come down to the pivot point, two brackets to stiffen the assembly and mount the display, miscellaneous spacers, latches, and springs, and the bezel and bezel cap. This assembly, like the bottom case assembly, is designed with manufacturing in mind. Most components of the assembly are stacked onto studs and then the assembly is held together with nuts. The bezel is held to the assembly by two screws hidden beneath the bezel cap, which is attached to the bezel with a double-sided adhesive foam through one of the arms before the two plastic parts are snapped together. This eliminates the exposed cable common in many competitive products. The clutches, or friction-restrained hinges, are mounted on the arms at the pivot point and are attached later to the top case assembly.

The top case acts as the "hub" of the product since all parts connect to it. The keyboard is mounted to the top case to avoid alignment problems and eliminate the

possibility of keys interfering with the top case surround, causing them to stick. The mounting of the keyboard is somewhat unusual, because it is threaded through the mounting tabs and then rotated into position before being tightened down with eight nuts. This mounting method allows the keyboard to be mounted in the top case without requiring special slides or pulls in the top case mold tooling to allow for the angle of the keyboard.

The display assembly is mounted to the top case by the clutches, which slip over hollow studs similar to those used in the bottom case. Being hollow, these studs allow screws to come from the bottom of the top case to connect to the hinge cover, making that connection invisible on the final product. The top case and the bottom case assemblies are then connected together by a rotating motion which engages a latch detail at the front of the unit, electrical connections are made, and the unit is completely closed by inserting and tightening screws from the bottom case to the top case via the hollow studs.

### **DURABILITY OF THE 110 AND PORTABLE PLUS**

Both the HP110 and the Portable Plus were tested to HP's Class A2 specifications. Several design iterations and close cooperation with the clutch manufacturer resulted in clutches that remain within the specified torque range for 30,000 cycles. The key switches were cycled 10 million times and the latch and spring assemblies were cycled 50,000 times. The units withstood step drops, on all six faces, at six-inch to 24-inch increments. Some units were still functional after drops up to 42 inches, but the abuse they had seen was cosmetically quite evident. The main problem in the Portable Plus was breakage of its LCD. The bigger display size in the Portable Plus posed problems not seen in the 110. The support of the display was improved by padding and cushioning added by the vendor within the display itself and additional cushions and bumpers added to the assembly on our production line. These changes made surviving the required drop height of 24 inches attainable for the Portable Plus.

### **I/O DESIGN CONSIDERATIONS**

One of the major features of the HP110 and the Portable Plus computers is the extensive input/output (I/O) capabilities that are built into each machine: specifically, the RS-232-C/V.24, HP-IL, and modem interfaces.

The selection of the types of I/O included in the HP portables was based on four major factors: power, industry standards, physical size, and ease of use.

#### **POWER**

The power consumption of the system was a major design concern and some of the major consumers of the system power are the I/O interfaces. For systems based on CMOS ICs, the power consumed by the system is directly proportional to the speed of the system. When applied to I/O interfaces, this means

that the faster the interface operates, the more power it requires. Because of this relationship between speed and power consumption, several attractive interfaces had to be eliminated as candidates. These included the HP-IB interface and the Ethernet (and other LAN) interfaces.

### **INDUSTRY STANDARDS**

By definition, a portable computer is going to be moving around, and consequently is likely to encounter a variety of different computers and peripherals that it needs to talk to. The ability to communicate via industry standards is a must.

### **PHYSICAL SIZE**

The word *portable* has become a computer industry buzzword, but the definition of "portable" has become very cloudy. The assumption made at HP's Portable Computer Division is that a portable computer user would want to carry the machine and at least one other bag while running through Chicago's O'Hare International Airport to catch the next flight. Even more important, the portable user shouldn't have to go into endurance training to do it (at least not because of the portable computer). Hence, the physical size and weight of a portable computer become very important design parameters. The space required for the I/O interfaces (printed circuit board space as well as the space needed to bring the I/O connector to the outside world) is a significant factor.

### **EASE OF USE**

People who travel tend to be in a hurry. If they need special tools and/or lots of time to connect or disconnect the I/O interface, it becomes a significant inconvenience. All of the interfaces chosen for the HP110 and the Portable Plus can be connected and running or disconnected and put away with very little time and effort.

### **PAM LANGUAGE "LOCALIZATION" ON THE PORTABLE PLUS**

"Localization" is the process of configuring a computer to accept and output messages in a specific language. PAM on the HP110 had all of its messages compiled within the code of the program, at several different points. This makes conversion from English to another language a time-consuming task, and means that several different versions of PAM (English PAM, German PAM, French PAM, etc.) had to be developed. In the initial design of the Portable Plus it was decided that native language support would be a high priority. Considerable effort was invested to ensure that the Plus' PAM would be as easy as possible to convert from one language to another, with a minimal impact on the internal structure of the program.

The objective with the Portable Plus was to have one version of the program that used a generic message system that made the current language of the machine invisible to PAM. To that end, all messages, softkey

labels, and other text strings were placed into the system configuration ROM.

The configuration ROM is an EPROM (erasable programmable ROM) that is programmed on the assembly line to contain system data and the serial number for each machine. For localization, the EPROM is filled with the PAM messages and the keyboard layout for a specific language. The system software uses the values contained in this ROM when possible. The keyboard driver, for example, defines the keyboard according to the mapping contained in the configuration ROM. When PAM prints a message to the user, it calls a system routine to display a numbered message from the ROM. The system then scans the EPROM for the text that corresponds to the desired number, and shows it on the screen. In this way, PAM deals with abstract message numbers, with the configuration ROM providing the actual text of the message in the proper language. The rest of the built-in software applications on the Portable Plus also use this mechanism to display their messages, making the basic machine fully localizable by simply inserting the appropriate configuration ROM on the manufacturing line.



## Current Notebooks: Who are the Heavyweights?

By Richard Hall

**110** HP Portables were some of the best portables ever produced, with rugged, lightweight construction, a long battery life, RAM-based memory for quick, problem-free file storage, and the ability to add ROM-based software without using precious disk storage. However, the HP Portables are no longer being produced, and eventually many of us will have to replace them with something compatible with current software and hardware.

**P+**

**PV**

**LS**  
**7/2**

The November 1991 edition of *PC/Computing* takes a long look at the present crop of notebook computers. *PC/Computing* "rounded up 20 units," all 20 MHz 386SX machines, and ran them through a battery of twenty tests, measures, and comparisons to assess weight, size, display quality, keyboard quality, system performance, battery-charge life, power-management features, BIOS screen options, and more. Based on these tests, they selected the best computer(s) for each of eight performance categories.

### **MOST POWERFUL**

For raw computing power they chose the COMPAQ LTE 386s/20 (\$4,399 with 2MB RAM, 30MB hard disk). This 20MHz notebook has a CPU with 4K of disk cache, and a hard disk with a fast access time. They also liked the LTE's video performance.

### **BEST OVERALL VALUE**

The Everex Tempo LX/20 (\$2,799 with 1MB RAM, 40MB hard disk) was a little larger than average, but had a great keyboard, a large, bright display, long battery life, effective power-management features, and "amazing durability." They also mentioned the Dell 320N (\$2,499 with 1MB RAM, 40MB hard drive) as a close runner-up in this category.

### **MOST DURABLE**

*PC/Computing's* "Tough Guys" prize was shared by three notebooks: the COMPAQ LTE 386s/20, the Everex Tempo LX/20 (already discussed above) and the Panasonic CF-370H6 Business Partner (\$3,849 with 1MB RAM, 60MB hard disk). They let these hombres sit overnight at 10 degrees Fahrenheit, strapped them to a paint-can mixer, spilled coffee on their keyboards, cooked them (6 hours at 130 degrees Fahrenheit) and dropped them from desktop height. Only the three above came through without major damage.

### **BEST KEYBOARD**

The Austin NP-913 (\$2,350 with 2MB RAM, 40MB hard drive) was best liked by *PC/Computing's* typing testers. It has large, normally spaced keys with full travel and arranged in standard key placements. The Austin is a little larger and heavier than other notebooks tested.

### **ELEGANCE AND PRESTIGE**

The "Vogue Model" award was given (a bit tongue-in-cheek) to the AT&T Safari NSX/20 (\$4,749 with 2MB RAM, 40MB hard drive).

### **LONGEST BATTERY LIFE**

The Austin NP-913 (\$2,350 with 2MB RAM, 40MB hard disk) got an amazing 7 hours of normal use in the

#### **Contact Information**

Austin Computer Systems  
10300 Metric Blvd., Austin, TX 78758; (800) 752-1577.

Compaq Computer  
P.O. Box 692000, Houston, TX 77269; (713) 370-0670.

CompuAdd  
12303 Technology Blvd., Austin, TX 78727; (800) 727-2500.

Everex Systems  
48431 Milmont Dr., Fremont, CA 94538; (800) 922-3839.

Panasonic Communications & Systems  
2 Panasonic Way, Secaucus, NJ 07095; (800) 742-8086.

Safari Systems  
14K Worlds Fair Dr., Somerset, NJ 08875; (800) 247-1212.

Texas Instruments  
Information Technology Group, P.O. Box 202230, ITG-067,  
Austin, TX 78720; (800) 527-3500.

PC/Computing test using built-in power conservation features and 4 hours of battery-charge life with all power-conservation features turned off.

### BEST VIDEO DISPLAY

The COMPAQ LTE 386s/20 (\$4,399 with 2MB RAM, 30MB hard disk) scored again with a bright 9-inch display screen with excellent contrast.

### GOOD THINGS COME IN SMALL PACKAGES

The smallest and the lightest award went to Texas Instruments' Travelmate 3000 (\$3,799 with 2MB RAM, 40MB hard disk) and CompuAdd's Companion SX (\$2,995 with 2MB RAM, 20MB hard drive). The CompuAdd is an OEM version of the Travelmate, with smaller hard drive options and better pricing. [Editors note: I have an old CompuAdd desktop PC at home. I've always received excellent support from them - Rich.]



*Products that make HP Portables smarter*

P.O. Box 869, Fairfield, Iowa 52556 515 472-6330

## Classic Computers: Good News for HP Portable/HP150 Users!

*CLASSIC COMPUTERS, founded by former Personalized Software employees, will take over HP110, Portable Plus, and HP150 business beginning January 7, 1992.*

**110** By Brian Teitzman and Larry Baldozier

**P+** Since announcing that Personalized Software could no longer afford to support the HP Portables and the **PV** HP150, we've received a lot of feedback from you on the decision. You told us that you appreciated our support in the past and wished Personalized Software well with *The Palmtop Paper*. **LS/12**

But many of you emphasized that you would miss the support provided for the HP Portables and the HP150s. Quite a few of you asked if there was any way

we could continue the support, perhaps on a slightly smaller scale. Personalized Software will focus its attention on *The Palmtop Paper*, supporting the new HP 95LX. However, the two of us will spin off the HP Portable/150 end of the business and provide you service and support for these excellent computers.

### A LITTLE BACKGROUND

We have had the privilege and satisfaction of serving many of you over the last 4-5 years. We are:

**Larry Baldozier** — with Personalized Software since July of 87, Director of Operations, Research and Development. Also responsible for Technical Support and Service/Repair.

**Brian Teitzman** — with Personalized Software for 4 years, Director of Sales and in charge of used equipment purchasing. Also responsible for customer service and technical support.

In 1991 the HP Portable/150 market could no longer support Personalized Software, a company that: developed new products every month, provided a user support publication and technical support, offered a complete line of new and used hardware and software, and provided hardware service, repairs, and upgrades. Personalized Software had a large product inventory to facilitate fast shipping, and offered a 60-day money back guarantee on most of its products, as well as a lot of pre- and post-sales support. All this required 15-20 employees, and a considerable overhead.

During our Liquidation Sale, we cut prices, pared down our staff to 4-6 employees, and provided a no-frills sort of customer support & service. We were very successful, and this inspired us to believe that perhaps a smaller company could be formed to fulfill your basic needs, and remain profitable.

### CLASSIC COMPUTERS

We will begin operation Tuesday, January 7, 1992, and be open three days a week (Tuesday, Wednesday, and Thursday) from 10 a.m. to 4 p.m. Central Standard Time. (Please see the end of this article, or the ad on the back cover, for complete contact information.)

We will provide full support for the HP110, Portable Plus, and HP150, including most of the products and services provided by Personalized Software:

- New & Used hardware, software, peripherals, & accessories;
- Hardware service, repairs, and upgrades;
- Custom ROM burning;
- New products — Available, but developed at a considerably slower pace. We have a few ideas, but are not ready to discuss them at this time.

The HP Portable Vectra CS, LS/12, and the NEC UltraLite will receive minimal support. We will no longer regularly stock any new or used products for these machines. We may occasionally have used hardware and accessories available, so you may still want to give us a call.

Some items will be discontinued because of very low demand, difficult availability, small profit, or excessive technical difficulties. We will make our final decisions over the next few weeks. We will be keeping our inventory at a much smaller level than Personalized Software, but it should be large enough to meet most of your needs. NOTE: we still have Portable Resource Packages available. These comprise back issues and Subscribers Disks for *The Portable Paper* and *The Ultra-Lite Connection*. We will stock these while supplies last.

### CLASSIC COMPUTERS PRICING/WARRANTY POLICIES

Pricing of products should remain very low! We will continue to offer the HP110 and Portable Plus in the price range we offered during the liquidation sale. Only a handful of items that were sold below, at, or near cost, will now go up in price significantly. HP150 prices will continue at, or less than the prices offered during Personalized Software's summer specials. With few exceptions, most of the items out of the last 150 catalog will now be available for around 1/2 price. Exceptions include, but are not limited to ReadHP, WordPerfect 5.0, and Lotus 1-2-3, version 2.01. Exact pricing will be available starting January 7, 1992.

We will accept prepaid checks, money orders, Mastercard or Visa (no American Express). All products will have a 30-day warranty. For more information, starting January 7, 1992, contact:

Brian Teitzman or  
Larry Baldozier  
Classic Computers  
P.O. Box 499  
Fairfield, IA 52556

Phone: (515) 472-0383  
Fax: (515) 472-0393

### SPECIAL THANKS ...

We (Larry and Brian) would like to express our special thanks to everyone who has supported Personalized Software over the years. It has been a pleasure serving you, and we look forward to providing for your needs for years to come.

An extra special thanks goes to Hal Goldstein. Without his full support and cooperation our continued support of this market would not be possible.

## First Edition of The Palmtop Paper Well Received by Subscribers

Richard Hall

**110** We published the first edition of *The Palmtop Paper* at the end of October, 1991. Not only *Palmtop Paper* subscribers, but our advertisers and Hewlett-Packard have been very pleased with this first issue. We're projecting between 3,500 and 4,000 subscribers by the end of 1991 (2,000 is the most subscribers we had for *The Portable Paper*).

Our success has a lot to do with what we learned with *The Portable Paper*: that the most important thing about a newsletter is that it contains useful information, and lots of it. Deep down inside, *The Palmtop Paper* has got *The Portable Paper's* heart. It's packed with useful information, most of which comes directly from the people who know the 95LX best — the users! So we have to thank you, *The Portable Paper* subscribers, for your feedback on how to make *The Portable Paper* better, and for your excellent contributions over the years.

With a larger subscription base, we'll have the resources to go further. We hope to improve the look of *The Palmtop Paper* with better graphics and more color. But our focus will be mainly editorial, and we have no plans to directly sell our own products in *The Palmtop Paper* (we are accepting display advertising from other vendors who directly sell products).

### CONTENTS OF THE FIRST ISSUE

The organization of *The Palmtop Paper* builds on the strengths of *The Portable Paper*. The Publisher's Message and Letters to the Editor are there, as well as News from Thaddeus Computing (our new corporate name) and a couple of familiar columns: Through the Looking Glass and The Savvy User.

There's a lot of third-party development associated with the HP 95LX. *The Palmtop Paper* will not only do in-depth reviews of some of the more noteworthy products, but will attempt to at least briefly describe any and all third-party products developed for the 95LX. In the first 48-page issue we have two in-depth reviews: a Dictionary/Thesaurus ROM card developed by Hewlett-Packard and Motorola's NewsStream Receiver that will allow the 95LX to receive messages and data via paging services. In addition over 60 product descriptions and 6-7 pages of display advertising are included, further describing third-party products. We even have a section on some of the DOS software (shareware, freeware, and commercial) that can be used on the 95LX.

We send out a questionnaire to everyone who subscribes, and so far we've discovered that users of

the 95LX have a wide range of experience. So we've included columns for the technically savvy, and the novice. Our "HP 95LX Support" section not only listed 95LX-related products available from HP, but reviewed and answered those questions most often asked of HP's 95LX support staff. We also described CompuServe's HPSYS forum, an excellent source of information on the HP 95LX.

Ed Keefe's also doing a column for programmers, and Hal's doing one for novice users. All in all, it's a packed 48 pages. Thanks again for your support over the years.

Any subscriber to *The Portable Paper* can get a free copy of *The Palmtop Paper*. Send, or fax in a request to: *The Palmtop Paper*, Thaddeus Computing Inc., P.O. Box 869, Fairfield, IA 52556; Fax: 515-472-1879. Please include your name and address and mention that you are a subscriber to *The Portable Paper*.



# PORTABLE PROFILES

## Putting an Application on ROM... and Other Notes

By Frank Keresztes-Fischer

**P+** With much enthusiasm, I plunged into a project some months ago: using ROMBO to convert DAC-Easy Accounting to a B-drive ROM application for the Portable Plus. I had three reasons for undertaking this: first, I liked using the package because it ran very quickly on the Portable Plus and was a generally well-behaved application; second, the ROM adaptation should have made DAC-Easy a more convenient application in the cramped environment of a Portable Plus; third, I wanted to share this with fellow Portable Plus users if I was successful.

I wanted to fit this 348K application file-set onto one ROM directory ... or at the most 256K of ROM space, including any supplementary batch files. I also wanted to modify DAC-Easy to run across two drives, e.g. read its software files from the B: (ROM) drive, and write all its 27 data files in the A: drive ... thus behave like other ROM'd Portable Plus applications.

I considered a number of alternate ROM-ing schemes. First I considered having the full suite of application files in one library in ROM (in a .ZIP file).

The idea was to extract them to the A: drive and run from there. As most Portable Plus users would agree, this is unhelpful due to A drive space limitations.

Another alternative was to have the frequently called modules reside in ROM, with the others on a utility floppy disk in the first HP-9114 (C-Drive). These others would be directly accessible from the application, and all data files would be written to the A: drive. Yes, this is a three drive system; it achieved the optimal point between the blazing speed of DAC-Easy in the Portable Plus' E-disk environment and the most economical use of the Portable Plus' I/O resources. An application adapted in this manner should run very satisfactorily. As I write this, I can report reaching some of my original goals completely, while failing at others.

DAC-Easy's suite of nine .EXE files consist of a master file named, EASY.EXE, a Microsoft BASIC Compiler Runtime Module named BASRUNB.EXE, and seven modules having a naming scheme of EA-0\*.EXE. A lot of complexities are caused by the fact that when running, the software expects certain files to be on specific drives.

After some experimentation, I modified the application's .EXE files (via NU of the Norton Utilities) such that the various .EXE files looked for their hand-offs in the B: drive ... not the A: drive as originally intended. Of course the Portable Plus's B: drive also requires a directory designation. This caused me to truncate the file names to accommodate the filespecs. Doing this conversion amounted to a bunch of busy-work, editing filespecs and testing the changes. But it also proved viable and functional, even with some of the application files located in the HP9114 floppy drive.

The challenge that I was unable to solve to any useful degree was the compression of any portion of the .EXE files of DAC-Easy. I was hoping to use one of the compression utilities available for executable files (LZEXE, PKLITE, DIET) but nothing worked. The compressed main module loaded if the runtime library was not compressed, but as soon as I tried to branch to one of the compressed child modules from the main menu, I was trapped by an error message. Obviously the parent file could not find the marker in the child file. Therefore, compressing the files and having the complete suite within one 256K ROM-set quickly faded as a solution. Considering the 348K size of DAC-Easy, I just don't consider DAC-Easy important enough to merit a second ROM bank in the ROM drawer for a full suite of the modules.

This all brings me to a very basic question ... how might different users apply DAC-Easy? My own needs are centered on the use of the General Ledger, Interest Calculations, Check Generation, Forecasting, Reports, and File Maintenance routines. These uses can be served with a subset of modules ... and as long as I don't invoke any of the missing modules and put DAC-Easy into limbo, I avoid having to exercise the three finger salute to reset the Portable Plus (Ctrl-Alt-Del).

One helpful aspect of DAC-Easy is that this type of malfunction does not jeopardize data integrity; data is continuously written to file every time an entry is completed and the Return key pressed.

The problem with my partial-suite approach is that

another user may have a different set of needs (maybe someone needs Purchase Orders, Accounts Payable and an Inventory system in addition to the modules I use). There are a number of different module combinations that can be configured, short of the full application suite.

So where does this leave us when we consider ROM-ing DAC-Easy? A full suite is overkill for most users (ROM space could be better allocated to other needs). A custom package for every user is the other approach, yet there are a large number of custom packages possible.

I have enhanced DAC-Easy's utility on my Portable Plus by adding a copy of the SHELP.SYS file. This way SHELP's Key Macro and other features are available exclusively to DAC-Easy, saving me many keystrokes, and allowing me to paste numeric data from the calculator. To achieve the integration of these two programs, I load the application via a batch file. However, it would be most helpful to have an extended pop-up utility that could serve as a help file to keep tabs on my Chart of Accounts, or to note the routine of complex allocations for certain transaction types.

I certainly would be delighted to assist other Portable Plus owners in setting up DAC-Easy on a ROM disk.

### REFLECTIONS ON THE PORTABLE PAPER

Tom Page ... whose contributions I always enjoyed, asked recently for suggestions for adding multi-line headers in formatting documents for printing. Tom, the best suggestion that I could make is that you pick-up a ROM version of MS-Word for your Portable Plus/ You can then have as many lines of headers, footers, footnotes, etc. as you wish with unquestioned control over fonts, margins, line spacing, text enhancements, etc. The lowly MS-Word version 1.1 for the Portable Plus is one of the best word processors available for text document formatting and working with an HP LaserJet to produce great looking results.

KEEFE KOLLECTION ... I just recently got a copy and wonder how I survived my adventures in poking around my executable files ... without the interesting collection of utilities like STRINGS, and many others.

STEREO SHELL ... is also part of Ed's collection and has been defended by Ed in several columns. I again attempted to load STS and was surprised that it actually came to life on my Portable Plus !... following failed attempts. However, I did not have my initial configuration settings correct and thus crashed my Portable Plus several times. Unfortunately, it trashed the DATACOM, TIME/DATE and SYSTEM CONFIG settings as well as my 1MB A: drive E-disk, though not my 2MB RAM disk. My D: drive is the sturdiest I/O device of my Portable Plus system. It has never crashed in over three years of use.

After I re-read Ed's comments in the Portable Paper, I discovered that I had "Sound" set to ON where it should have been OFF. This solved the crash problems. Since then I have been getting familiar with this application and am so impressed with it that I am considering its use as my command center.

Ed, thanks to your tireless efforts much interesting

and very useful software has been made available to our user group. I want to chime in with my appreciation for your informative and entertaining columns from the earliest days of *The Portable Paper*. It seems, on reflection, that these past six years with *The Portable Paper* have been a giant adventure ... even more absorbing perhaps than the model railroads of my youth. Certainly I learned more useful (and useless) things than when I worried about track laying and train operations. If this keeps up, I'll sound more like Jerry Pournelle!

I guess this is my swan song for *The Portable Paper*. It has been a valuable resource to me and I learned most that I know about computers from its pages. It occurs to me now that when I received my first copy of *The Portable Paper*, I was struggling with an HP110 and an early COMPAQ 'luggable' trying to understand how to entice a rudimentary LOTUS spreadsheet from these magic boxes. Since then *The Portable Paper* and its contributors have become good friends. I shall miss this link with our user group, but I'll keep computing on my Portable Plus until I see a new generation laptop that makes as much user sense as the Portable Plus did in its heyday ... and even today.

### MY PORTABLE PLUS AND THE FUTURE

One of the ironies in the evolution of the laptop PC is that it has become a mere commodity ... sold by the pound, and packaged to the lowest common denominator. User groups like ours seem not to be as valuable a resource any more. Yet imaginative technical solutions, valuable to a subset of the user universe, are not found in these lowest-common-denominator computers. I hope that HP, IBM, and our other domestic players keep this in mind as they watch the field around them swamped with look-alike foreign knock-offs.

As I look over the past six years, my investment in my Portable Plus system, hardware peripherals, and software, well exceeded \$10,000. Yet that was cheap compared to the total time I poured into learning and gaining confidence in this enabling technology. My next system will be again at the leading edge, in a similar-sized package, with all solid state hardware and a true 32-bit architecture. True multi-tasking is one reason why I am looking forward to my eventual upgrade into a true 32-bit system. Then I hope I won't have to wait eight minutes for my soft-fonts to load, before I can resume my other tasks.

On the software side, I fail to see why the big rush to the universal use of the resource hungry GUI (Graphical User Interfaces), unless one is an obvious PC novice. While GUI's seem to be essential to certain types of applications, like graphics and page layout programs, they are in reality a distraction to the mundane number-crunching, text-processing and data-base applications.

[Frank Keresztes-Fischer is a regular contributor to *The Portable Paper*. You can contact him at ELIXAIRE Corporation, 14777 Keel Street, Plymouth, MI 48170, USA; Phone: (313) 227-5488 — Rich.]



# Through the Looking Glass

By Ed Keefe

## 110 IT'S A WRAP!

**P+** We knew it had to happen. The final blow-out sale for the HP 110 and Portable Plus will have come and gone by the time you read this column.

**PV** As of now, there is no longer any commercial source of supplies or support for the best portable computers ever built. [Fortunately this is NOT TRUE. Two of Personalized Software's most experienced employees will be starting their own company and taking over our HP Portable and HP150 business (see "News from P.S.", page 14).]

I hope you took advantage of the Liquidation Sale before October 11. The prices for brand new HP Portable Pluses were astounding.

As Hal Goldstein mentioned in the Liquidation Sale flier, the HP Portables are virtually indestructible. They will provide us with many more years of practical computer usage before the last battery pack goes round the bend. (And, even then, they will still keep on ticking if you keep them hooked to the AC charger.) [Batteries can be obtained from HP Direct (800-538-8787).]

So, even though we will not have a readily available source of information and products for our favorite computers, the computers themselves will live on. Vive la HP Portables!

## A TOUGH DECISION

Let's face it, Personalized Software has gone the extra mile over the past few years to continue supporting the HP Portables. They've watched their profits dwindle, while they kept adding value to our machines with information and product support. But there comes a time in the life of most small companies when a decision has to be made. For Hal, the decision to stop supporting the HP laptops must have been painful. Nonetheless, Hal made the decision to cut his losses, and, I, for one, support his decision. Vive la Personalized Software!

## THE FINAL PRODUCT

I plan to continue using my Portable Plus for the next several years. For quick development of C and Pascal programs, it can't be beat. With both C and Pascal in ROM, I can crash the machine with impunity and

recover much more quickly than I can on a desktop computer.

I continue to look for software that will run on the Portable Plus. There are still a few people who write well-behaved software for non-IBM, MS-DOS machines.

Eric Meyer, for one, still supports the Portable Plus with his Video Display Editor. The latest version of VDE 162a is in the final stages of testing. It should be available for distribution by the time this column reaches you. I will be sure to upload the program on the HP Forum of CompuServe. The new features include a true 40 column mode of operation (not available on the Portable Plus) which should make the program usable by those who are visually impaired.

## THE SAGA CONTINUES

The HP 95LX continues to sell well beyond the expectations of HP. Perhaps by the end of the year Hewlett-Packard will have caught up with the demand for this machine. My HP 95LX has become my constant traveling companion to my new job site.

I continue to teach data processing and computer programming for the local community college. However, my office and classes have been transferred from a suburb of Des Moines, Iowa, to the city campus. Because of the changing nature of our student body, almost all of my classes are offered in the evening.

Since my memory starts to shut down around 5 pm, the 95LX is never far away, beeping a reminder or keeping my classroom presentations on the topic and on schedule. It also contains all my grades and an ever-growing list of things to do. It has become my Little Black Box. In between classes, the Little Black Box serves as a diversion. I've written about twenty game programs for the 95LX just so I can have a few moments of fun while looking productive.

I've found, like most people, that typing on the tiny keyboard of the 95LX is a real chore. However, that has not stopped me from using the Little Black Box to make last minute modifications to lecture notes and to key in questions that can't be answered on the spot.

## BUT I DIGRESS...

As an aside, I might mention that one of the unique features of my new teaching assignment is that I get to use DR-DOS 6.0 on my desktop computer. DR-DOS (Digital Research's answer to MS-DOS) is a feature-packed rendition of the operating system for PC type computers. DR-DOS has some nice features. I won't go into all of them here. If you're interested in reading more about DR-DOS, I'd recommend the Nov. 12 issue of PC-Week.

The only bad part to using DR-DOS on my home computer is that it takes over the addresses used by the HP-IL interface card. I have not yet been able to get my desktop to talk to my Portable Plus. I can force the desktop to acknowledge that there is "some" device attached to the operating system. However, trying to do something as simple as obtain a directory listing of the Edisk, ROM-disk (or even a directory of a 9114 disk) is an exercise in futility. Digital Research acknowledged that there might be a problem with such a device as the

HP-IL card. However, they do not have any such card for testing, so I'm on my own with this problem.

## THE PASSING OF THE PORTABLE PAPER

The passing of *The Portable Paper* means that its loyal readers won't have to check the mail every two months to see if their favorite journal has arrived. There will no longer be any excuse to stay up late at night poring over the pages of *The Paper*.

For many of us *The Portable Paper* has been a support group. Somehow, *The Portable Paper* made it OK to use a laptop computer that was out-of-date and not totally IBM compatible.

So what if some computer hot-shot might remark, "Golly, gee whiz, an HP laptop: how quaint!" We could slough off such snide slurs with a knowing smile. We knew that we had the best laptop around. And, every two months, other "true believers" would come to us, in print, to support and reinforce what we already knew and believed. Now that support will no longer be there when we need it.

With this last issue of *The Portable Paper*, I bid you adieu. I would, again, like to thank all the people who have contributed to *The Portable Paper* over the past six years. You've made it what it was: the finest, small computer journal in the world.

I'd also like to thank all of you who have said kind words about this column. I've enjoyed writing it. If I've helped make you a little bit smarter in using your computer, then the heart of this old teacher will skip a beat or two.

## AN INVITATION

Let me invite you to become a reader and/or writer for *The Palmtop Paper*.

*The Palmtop Paper* looks like another great means of sharing our enthusiasm for, and experience with, computing. "Through the Looking Glass" will reappear in that publication, but in a much more concise format.

## LET'S STAY IN TOUCH

Without *The Portable Paper* it will be tough to keep up with any new developments for the HP laptops. For my part, I plan to continue using my Portable Plus: at least until HP produces a notebook computer that can run both UNIX and MS-DOS, without any disk drive.

If I run across any new programs that will work on the Portable Plus, I'll be sure to upload them to the HP Forum of CompuServe.

I'll still enjoy hearing from you. You can reach me via CompuServe [73277,1064] or via land mail, 314 SW Logan Ankeny, IA 50021.

And, as always, "Until next time....Happy Porting."

*[Ed Keefe is an author, programmer, computer science instructor, and long-time contributor to The Portable Paper. He is the president of the Fast Aid Company, 314 SW Logan, Ankeny, IA 50021. Ed's CompuServe ID# is [73277,1064]. Ed will continue "Through the Looking Glass" in The Palmtop Paper, our new publication supporting the HP 95LX Palmtop PC. Ed's expertise has added much to The*

*Portable Paper over the years and we want to thank him for his selfless devotion to knowledge. He's truly a great teacher.*  
— Hal, Rich, Larry, Brian, Glen, Dee, and the rest of the staff of Personalized Software — ]

# THE SAVVY USER

By Thomas R. Page

## TRANSFERRING FILES VIA CROSSTALK

**110** **P+** When HP introduced the Portable computer in 1984 it was anticipated that Portables would be used as a supplement to a desktop computer. To make transferring files between the Portable and desktop computers easy HP developed the HPLink program and an HP-IL card for the IBM-PC. This provided a very convenient method for linking the Portable and desktop computer. The HPLink program made the disk drives of the computer on which it was running act as disk drives of the other computer. As it actually developed for many users, their Portable became their primary computer. Certainly my Portable Plus is my primary computer and until I purchased my Portable Plus, my original HP110 was my primary computer. After spending my money on a Portable, I couldn't afford a desktop.

Since the Portable used a 3.5 inch disk, and since at the time it was introduced PC compatibles did not support a 3.5" disk drive, I had to develop a way to transfer files between my Portable and an IBM-PC at work. An HP-IL card for one of the office PCs would have been an ideal solution to my problem, but unfortunately I could not convince our Computer Information Systems department to install a non-standard card in one of the Company's PCs. I therefore had to find another solution.

Fortunately there was a ready-made solution. The office PCs were equipped with the Crosstalk communications program which provides, in addition to terminal emulation, simple but effective host services. I loaded Crosstalk on the PC and put it in host (answer) mode and used my Portable's built-in communications program and internal modem to call the PC. Establishing a data link and logging on to the PC proved to not be difficult at all, but when I tried to transfer a file using the Xmodem protocol my heart sank. It simply could not be done. I began to think that maybe all those experts that had warned me against buying a non IBM-PC compatible computer might be right.

I did not give up. I called HP technical support and

explained what I was trying to do. They informed me that an error had been made by Crosstalk's programmers in implementing the Xmodem protocol and suggested that I call Crosstalk's technical services and get a fix.

Crosstalk anticipated that most users of their program would be communicating Crosstalk to Crosstalk and using Crosstalk's proprietary protocol for transferring files. Xmodem was included only to provide a level of generic compatibility with other programs. In fact the Crosstalk manual warned that Xmodem was not supported and that technical support would not answer questions about using Xmodem.

With some trepidation I called Crosstalk. The phone was answered by a very courteous gentleman who admitted that an error had in fact been made in implementing Xmodem. He explained that the program could be easily fixed with DEBUG. I didn't much believe him since at that time I could hardly use the DOS copy command much less something heavy duty like Debug. As there was no alternative I carefully transcribed his instructions.

Fortunately fixing Crosstalk was easy. And with the fixed version of Crosstalk, transferring files between the PC and the Portable became a snap. But at 300 baud, it very was slow. Later I learned that I could use my Portable's 91222P serial printer cable to implement a direct serial port to serial port data link with the ability to transfer files at 9600 baud, the fastest data rate the PC's serial port was capable of handling.

HP followed many of the concepts developed for the original Portable in designing its 95LX palmtop computer, including the assumption of support from a larger computer, either a desktop or laptop. Normally this support is implemented by the connectivity pack and a PC-compatible computer. Although I have access to a number of PC-compatible computers, I am finding that I am using my Portable Plus as the primary support machine to provide my 95LX access to a disk drive. Running Crosstalk in host mode on the 95LX makes transferring files between the 95 and the Portable very easy.

Since I discovered that my Portable Plus reads from and writes to 3.5 inch IBM formatted disks, I have used this disk format almost exclusively, rather than the HP format. Actually I think the IBM format is inferior to the HP format, but there are many more machines that can read IBM format. This makes data stored on an IBM-formatted disk more valuable. Although there is a program for the Plus that will format IBM compatible disks, I have generally formatted disks on a computer at work and kept a supply of formatted disks in reserve. Formatting disks is right up there near the top of the list of the world's most boring jobs. Preformatted disks — buy a box at you neighborhood computer store — are the greatest thing since sliced bread.

**110 IN CLOSING**

**P+** I don't believe this last issue of *The Portable Paper* marks the end of the HP Portable, but without the excellent support of Hal and Personalized Software, use **PV** of the machine will certainly decline. But some of us **LS/12**

diehards will continue to use our Portables for a long time. The Portable Plus continues to be my favorite computer.

There has actually been a positive side of the Portable's PC incompatibilities. I am sure if the Portable were 100% PC compatible I would not know near as much about using computers. Because of its incompatibilities, I had to get much nearer to both machines to make them work.

I am quite proud of the work that *The Portable Paper* has done. Portable users and *The Portable Paper* have been too far ahead of the pack to be leaders. A number of explorers beat Columbus to the New World. Columbus gets the credit for discovering America. Don't even think about telling anyone that we led the portable computer revolution. We were too far ahead to be noticed.

There is one feature that was done in the Savvy User Column that was so advanced that I feel like patting myself on the back for it. That feature was modem communication via the cellular telephone system. Although I had no use for the technology, I experimented with my Portable and a modem designed for use with a cellular telephone and proved that the connection could be made and was able to identify solutions to several problems encountered.

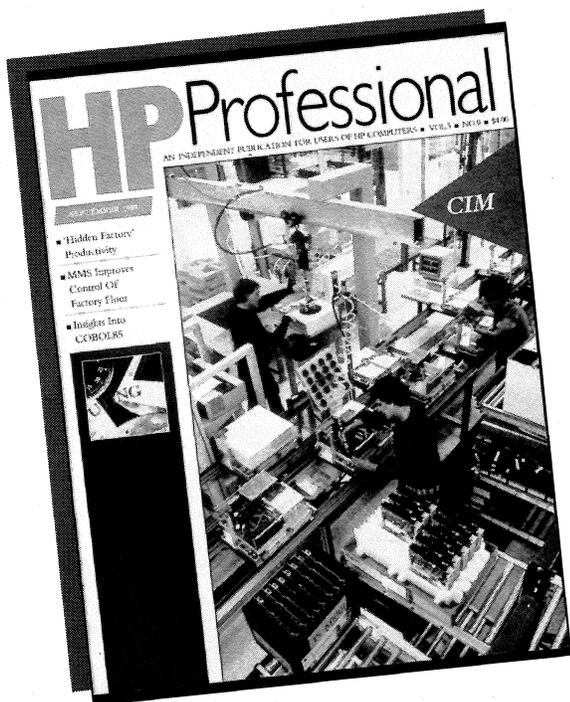
The Savvy User is migrating to *The Portable Paper's* successor publication, *The Palmtop Paper*. I hope all of you will buy a 95LX and join me there.

*[Tom works for a natural gas pipeline company in Houston, Texas and was one of the first to use PC's in the natural gas industry. His excellent contributions to The Portable Paper over the years earned him the title "The Savvy User." Tom will continue his column in The Palmtop Paper, our new newsletter supporting the HP 95LX Palmtop PC. We'd like to thank Tom for his practical insights and Texas common sense — Hal, Rich, Larry, Brian, Dee, Glenn, Margaret, and all the folks at Personalized Software.]*

**Products/Services Advertised  
or Discussed in This Issue**

AT&T Safari NSX/20 .....	13
Austin NP-913 .....	13, 14
Classic Computers .....	1, 2, 24, back cover
Compaq LTE 386s/20 .....	13, 14
CompuAdd Companion SX .....	14
CompuServe .....	4
CrossTalk .....	19
DAC-Easy .....	16
DIET .....	2
DR-DOS 6.0 .....	18
Everex Tempo LX/20 .....	13
HP 95LX .....	2, 3, 18
Keefe Kollection .....	17
Palmtop Paper .....	15
Panasonic CF-370H6 .....	13
Portable Navigator .....	4
Stereo Shell .....	17
TI Travelmate 3000 .....	14
VDE 162a .....	18

# FREE SUBSCRIPTION OFFER



If you're a Hewlett-Packard computer user, and buyer of HP-related hardware, software, or peripherals, HP Professional, the monthly magazine for Hewlett-Packard commercial and technical computing, is for you. It's a free source of valuable information that will help you do your job.

**It's Informative.**  
**It's Monthly.**  
**It's Read by over 35,000**  
**Professionals Like You.**  
**It's FREE!**

Read HP Professional for information and insights on the latest hardware, software, trends and developments.  
**Start your free subscription today . . .**

Send us the coupon below. You'll receive a subscription application in the mail. Fill out and mail the application to qualify for your free subscription.

## HP Professional HPN SUBSCRIPTION APPLICATION REQUEST

**YES**, I'd like a FREE subscription to HP Professional. Send a subscription application to:

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Telephone (    ) \_\_\_\_\_

Mail to: HP Professional, P.O. Box 616, Horsham, PA 19044-0616.  
Or call Lori Ulbrich at (215) 957-1500, or FAX (215) 957-1050.

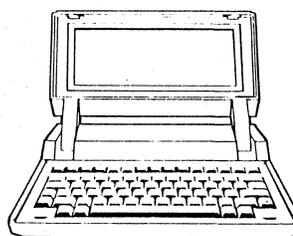
# Classic Computers

## Supporting your HP110, Portable Plus, and HP150 needs beginning January 7, 1992!

Hal has offered us the opportunity to liquidate the last of Personalized Software's Portable Plus inventory. The result is the lowest pricing ever for a never-used Portable Plus with software and extra memory. Our grand opening special includes:

### GRAND OPENING SPECIAL -- \$395

- Never-used 512K Portable Plus (European units, keys replaced with U.S. keys, add \$25 each for case or manual.)
- 128K Memory Drawer
- ROM Software Drawer
- MemoMaker/Time Manager on ROM
- Reflection on ROM
- Webster's Spelling Checker on Disk
- HP Duette on Disk



**Price of \$395 good only while supplies last. SHIPPING - \$25 UPS Ground.**

#### SUBSTITUTIONS:

Writer's ROM for MemoMaker: add \$100  
384K Memory Drawer for 128K: add \$79

#### ADDITIONS:

ThinkJet Printer: add \$159. Combo ROM: add \$129.

#### TO ORDER:

**PAYMENT:** Prepaid check, money order, Mastercard, or Visa (*no American Express*). Specify "Grand Opening Sale" and quantity. Orders accepted starting January 7, 1992.  
**SEND ORDERS TO:** Classic Computers, P.O. Box 499, Fairfield, IA 52556

#### Phone Orders:

(10 a.m. to 4 p.m. Central Time, Tues-Thurs)

**(515) 472-0383**

#### Fax Orders:

(Anytime beginning Jan. 7, 1992)

**(515) 472-0393**

# Grand opening Special!

\*\*\* THIS SPECIAL FOR U.S. CUSTOMERS ONLY \*\*\*

## PERSONALIZED SOFTWARE

A Division of Thaddeus Computing, Inc  
P.O. BOX 869  
FAIRFIELD, IOWA 52556

**\*\*COMPLIMENTARY SUBSCRIPTION\*\***  
EVELYN GOLDSTEIN  
1240 CHERRY ST  
WINNETKA IL 60093

Bulk Rate  
U.S. Postage  
**PAID**  
Fairfield, IA  
Permit # 218