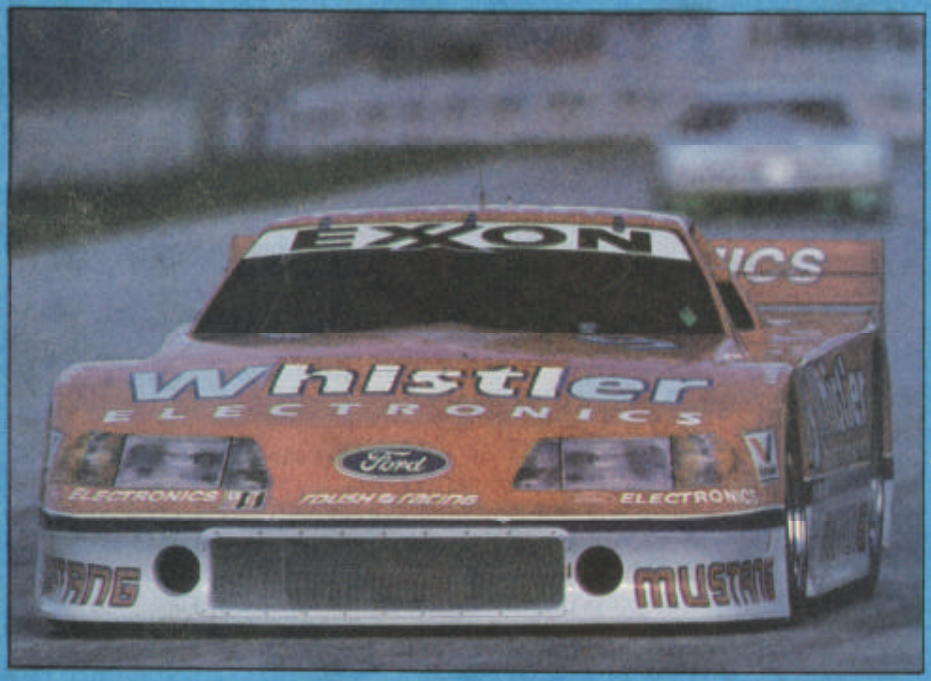
TANDY LAPTOP COMPUTING JULY/AUGUST 1991 -VOL. 8, NO.5

TERRY KEPNER'S

portable 100

$3.95/CAN $4.95
A MONTHLY PUBLICATION (EXCEPT COMBINED JULY/AUGUST ISSUE)



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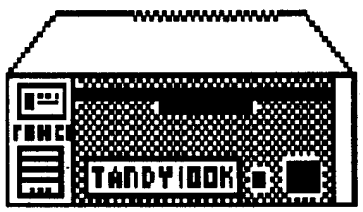

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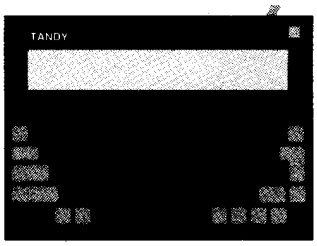
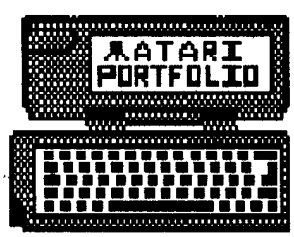
Package#3: WP-2 + WP2DOS (IBM) Bundle . . . . . $ 399.95 (Reg. $ 430.00)
Package#4: WP-2 + 128K Chip* + WPDUET Bundle $ 479.95 (Reg. $ 530.00)
Package#5: WP-2 + 128K Chip* + WP2DOS Bundle $ 459.95 (Reg. $ 530.00)
EXTRAS: CARRYING CASE $49.95 / AC ADAPTER $6.95 / 200K DISK DRIVE $ 179.95
UPS GROUND SHIPPING & HANDLING IS AN EXTRA $8.00 (*Note: memory chip installed)



The Atari Portfolio Palmtop Computer Special (New units only)

The Portfolio is a 128K Pocket-sized Computer, based on MS-DOS 2.11, with a 40 x 8 LCD screen, only 1 lb weight & with built-in application software.



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EXTRAS: CARRYING CASE $29.99 / AC ADAPTER $9.99 / PORTFOLIO BOOK $17.99
UPS GROUND SHIPPING & HANDLING IS AN EXTRA $8.00

Note: Ultrasoft will accept trade-ins of used Tandy 100/102/200/DVI and accessories (in any condition) against the purchase of an Atari Portfolio or Tandy WP-2 and related accessories.

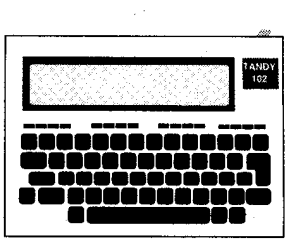
The UltraCard Special for the Tandy 100/102

The UltraCard is a Memory Expansion System for the 100/102, using credit-card sized RAM Cards. The unit is external, weighs only 8 ounces and has dimensions of 6.25"x4.5"x0.5" (WxLxH). RAM Cards will store both RAM-based (.BA, .DO, .CO) and ROM-based (SuperRom, URII, etc.) files. Two cards slots are available, for a total of 512K memory expansion.

UltraCard Interface 100 or 102 + 128K RAM Memory Card = $349.90
UltraCard Interface 100 or 102 + 256K RAM Memory Card = $449.90

Please note that you can upgrade at any time from one card size to the next simply by returning your old card and paying the difference in price between one card size and the next.

The UltraCard for the Model 100 and Tandy 102 is in production now. We are accepting orders on a first come - first serve basis. To begin with, quantities of the UltraCard will be limited. The first orders will only begin to be shipped by the end of June, 1991. The next deliveries will be 4-6 weeks later. Call for details.



Please contact Ultrasoft for a complete 100/102/200/WP-2/Portfolio product listing.

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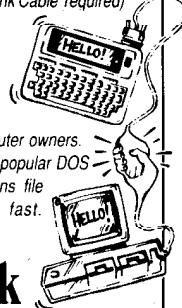
Club 100 — Pleasant Hill, California — Tandy Laptop User Group

Lapdos II

Turn your Model 100/102/200/NEC8201 into a PC-partner. Connect your laptop computer or Tandy Portable Disk Drive directly to MS-DOS computers for file transfers at 19200 baud. Fast! Easy to use. Single or batch file transfers at the press of a button. Feature rich! (Computer <—> Link Cable required)

WP2DOS

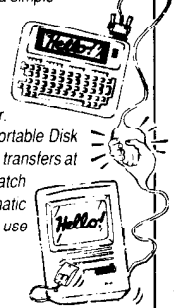


Turn your WP2 into a PC-partner. The only "file transfer" and "file conversion" software available or WP2 to DOS computer owners. Online utilities convert WP2 .DO files to popular DOS word processing file formats ... maintains file formatting codes. Super easy and fast. (Computer<—>Link Cable required)

Computer Link <—> Cables

Custom-built cables specifically developed for use with Lapdos II and WP2DOS. More than a simple "null-modem" cable.

100duet



Turn your Model 100/102 into a Mac-partner. Connect your laptop computer or Tandy Portable Disk Drive directly to Macintosh computer for file transfers at 19200 baud. Fast! Easy to use. Single or batch file transfers at the press of a button. Automatic file translations allow your Mac programs to use your laptop files, directly!

Loader

Add-on connection program enables Model 200 and NEC8201 owners to use 100duet.

WP2duet

Turn your WP2 into a Mac-partner. Connect your laptop computer or Tandy Portable Disk Drive directly to Macintosh computers for file transfers at 19200 baud. Fast! Easy to use. Single or batch file transfers at the press of a button. Automatic file translations allow your Mac programs to use your laptop files, directly! Maintains file formatting codes.

The Ultimate ROM II

*Four programs in one make this more than just a "super" ROM. **T-WORD:** overwrite/insert mode while editing, imbed print controls, control print output (margins, line spacing, page feeds, headers, footers, auto page numbering, bold face, underline, italics, mail merge, labels, and more), pixel-plot view of document before printing. **T-BASE:** true relational base operations, key field sorts, math, report generation, etc. **IDEA!:** outliner program for concept development. **VIEW 80:** see up to 60 characters per line while in TEXT, TELCOM and BASIC, fast processing, easy to read. **TS-DOS LINK:** automatically loads and runs TS-DOS from disk without conflicts (TS-DOS on disk, sold separately).*

TS-DOS on Disk

Super fast, easy access to your TPDD or TPDD2. Available for Models 100/102/200 and NEC8201. Features: file tagging, file printing direct from disk or RAM, direct access to disk drive from within BASIC or TEXT. Use by itself or with the Ultimate ROM II or other ROMs

TS-DOS on ROM

When all you need is disk access without using RAM. Super fast, easy access to your TPDD or TPDD2. Available for Models 100/102/200 and NEC8201. Features: file tagging, file printing direct from disk or RAM, direct access to disk drive from within BASIC or TEXT. ROM version includes file compression in RAM. Program runs from ROM - uses no RAM!

ROM2/Cleuseau

The very best programming tools available for Model 100/102/200 and NEC8201 laptop programmers. Two ROMs in one, and more. ROM2 is a full functioned 8085 macro assembler. Cleuseau adds much needed features to BASIC and TEXT. Call for full details.

Power Pillow

Good-looking, powerful, long-lasting battery pack encased within an attractive black-vinyl holder provides hundreds of hours of battery life. Attaches to the back bottom of your laptop with velcro (included). Hand crafted and tested. (Requires 4, "D" cell batteries, not included).

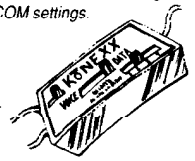
Keyboard Bands

Just the right size dental rubber bands necessary to almost eliminate Model 100/102/200 keyboard noise. Great for library and meeting use. Easy to install. Instructions included.

Quick Reference Card

Don't leave home without this handy three-fold card, containing all the functions for Model 100/102 use. Includes a listing of BASIC, TEXT commands and TELCOM settings.

KONEXX

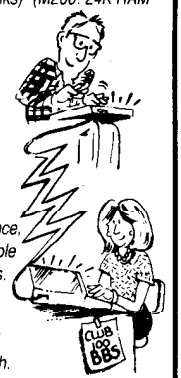


The hottest, new line-attachment for going online though office PBX and hotel phones. Does not require a dedicated line. Active electronics provide much more than simple switching. Attaches, in-line, between the phone handset and the base. Includes clips for hard-wired base-to-handset found in most hotels. Small size - fits in pocket.

RAM Expansion

Expand your Model 100/102/200/WP2 computer's RAM. RAM chips, RAM expansion modules and WP2 RAM disks available. (M100: 8K RAM chips, 64K and 96K RAM Exp Banks) - (M102: 8K RAM, 128K and 256K RAM Exp Banks) -(M200: 24K RAM banks) - (WP2: 128K RAM disk)

Free BBS



Our free-2-use bulletin board computer is available 24 hours a day. Features: free public conference, free classified advertising, free laptop reference material, free newsletter, free downloads, product ordering, assistance, and more. Log on with any computer. Simple menus fit all 40 character, 8 line displays. Fast, interrupt drive, easy to use for beginners. Friendly. No online cost. Unlimited online time. PC Pursuitable! Optional online library access $1 a month.

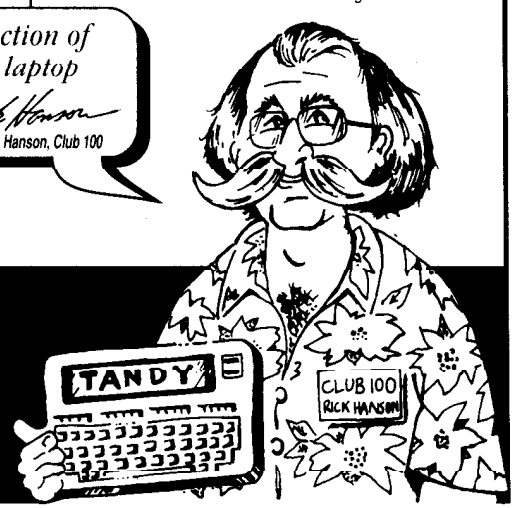
Program Collections

We have the largest "quality" collection of public domain, shareware and author-specific programs available for Model 100/102/200 users, i.e., text, print, telcom, business, graphics, drives, utilities, games, music, programming, education. Available online or mail order on disk. Listings available.

"Look to Club 100 for the largest selection of performance products to make you a laptop power user. Call today!"

Rick Hanson

Rick Hanson, Club 100



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Circle 160 on reader service card.

ON THE COVER:
The Roush Racing team's car and the two Tandy laptops that help them win races and adapt to changing track conditions almost immediately.

Photos courtesy of Campbell & Co., and Ford.

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July/August 1991

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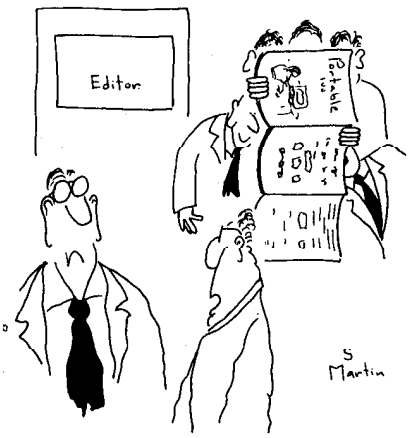
ROM WITH A VIEW



"...remember last month when you went on vacation and left Bob Liddil in charge?"

Summertime—yo! How's your summer going? Doing everything you waited all year long for? I hope so. (For the benefit of our Left Coast readers, "summer" is when the sun shines a lot and you don't have to scrape New England off your windshield before slipping and sliding to work.) And it's here, which means that this is our combined July/August issue, so I only have to work half-days for the next few weeks. Don't know which half yet—the first 12 hours or the last 12 hours—but I'm definitely gonna cut back some, and do some of what *I've* waited all year for.

F'rinstance, about the time you're reading this, I'll be hanging out with my very favorite person in the whole world (and if there's life on other planets, my very favorite person in the whole universe), my daughter Shannon. You've heard about her in my various editorials, and she's heard about you in my phone calls, letters, and visits.

Then I'm gonna get back to playing "techie" for a while. Shed my "suit," sit around in my Papa Smurf jockey shorts, and cut some machine language bytes. (Heaven!) Make some new, killer ROM programs that you just can't live without, and make 'em available to everyone.

It's possible now, you know. With EME's extRAM, you can store all the ROM images you want on a Portable Disk Drive (PDD) disk or PC-compatible computer and load 'em in as needed. I won't get into the details here (we'll cover that in upcoming issues), but it's fast, easy, and WONDERFUL! We can have anything we want, without using up our "miniscule" (but darn adequate) 32K RAM memory. And now, with the long-awaited release of Ultrasoft Innovations' UltraCard, we can store ROM images on the UltraCard itself! Just as soon as we get a review unit, we'll give you the full scoop. Often, you won't really need an MS-DOS box, except for specialized applications.

One last note before I book my flight Shannon-ward. Remember the "Scholar-Chip Program" (INPUT/OUTPUT, May '91), where California high school students were issued Tandy 102's? Well, we received the finalists' essays on "How the Tandy 102 Changed My Life." The votes were counted, the winner chosen, and the prizes awarded. It was tough to pick a favorite—they all worked very hard, and all did a great job. Much as we'd like to share the results now, I don't think it's fair to do it during the summer. Instead, we'll feature the winning essays in our September issue, to ensure the students their full "bragging rights" among their peers when they're all back in school. They've definitely earned it!

Now, since you're/we're on vacation, I'm wrapping this up early. Thanks for all your support, for all your letters, and for having the good sense to realize what fine machines the Tandy laptops are. Have a happy, safe summer, and we'll see you in September! (For the benefit of our Left Coast readers, "September" is when the trees begin to change color, and you don't even mind that you'll soon be scraping New England off your windshield again.)

Catch ya!

Nuge

Toolbox

Manuscripts were typed into Microsoft Word 4.0 on a Tandy 1500 HD, where they were edited, spell-checked, and had basic format instructions inserted. From there they were loaded into a Tandy 4000 (80386 CPU, Tandy EGA Monitor, Tandy LP-1000 LaserPrinter) desktop computer and placed into Aldus' IBM PageMaker 3.01 Once there, design decisions on photo, figure, and listing sizes and placements were made. Here, pull quotes are placed, headlines, intros, and bylines are sized and positioned, and advertisements positioned.

Normally, the Tandy LP-1000 is capable of emulating only a Hewlett Packard Laser Printer Plus, but with the addition of the Destiny Technology Corporation (300 Montague Expressway, Suite 150, Milpitas, CA 95035. (408) 262-9400) PageStyler 4.5MB kit, the LP-1000 is turned into a fully-compatible PostScript printer, with all 35 native fonts that are found in the Apple LaserWriter Plus printer. The Destiny PageStyler is available through the Tandy Express Order Hardware system.

Page previews were output from the Laserprinter. When everyone was satisfied with the appearance, final pages were output and artwork and lineart ads were positioned. The finished magazine was then delivered to the printer, who printed it, labeled it, and mailed it to you.

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portable 100

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Window Dumping

Hey, Mike, I got an idea! *[Please see Figure 1.]* As you can see, *CHDUMP* (May '90) is working great. Thanks.

With all the graphical interfaces out there, how about Windows 100?! With similar techniques as used in your *DVORAK*, *HOTKEY*, and *CHDUMP*, this could provide access to menus and options from within *TEXT* and ... ? It could be integrated in something like James Yi's *TEXT+* since the same keyboard scan is used. Otherwise, it would be a stand-alone program. It may also work well on that *Portable 100* ROM project.

Well, since you are so busy, could you direct me to the info so that I can learn machine language and option ROM programming? Then *I* can give *you* the ROM rather than me asking for it!

Cory Hawkins
Portland, OR

Neat idea, Cory! Experimenting with M100 pop-up windows back in 1984-85, I smacked into the problem of how to save, restore, and update the system "environment" when using windows. "LOMEM" techniques (used in Paul Globman's Tandy 200 XOS operating system) held promise, but differences in the M100 bootup routines shot it down. I believe now that we can get around it by using a special option ROM to modify the bootup routine. In fact, with EME's ExtRAM it may be possible to put the operating code and the environment storage space on the same chip! I hope your letter will nudge a few programmers to pursue it further.

For information on programming option ROMs, refer to King Computer Systems' advertisement for manuals on the subject.

-MN

Figure 1. Windows for the Model 100? Screen dump by CHDUMP.

IN RECOVERY

In a recent issue of *Portable 100*, I read in your editorial of your helping a fellow out who lost the directory on his Portable Disk Drive. That has happened to me twice, and I threw the disks out, thinking the situation hopeless. You mention in your editorial that there are "utilities" available for recovering data from a disk with a lost directory. I have the Tandy PDD-2. Please put me on the trail to get these utilities.

Nichlas Ayo
Notre Dame, IN

For the PDD-2, you'll find a neat little utility on CompuServe in the Model 100 Special Interest Group (M100SIG) database library that uses parts of FLOPPY *to access disk sectors. For the PDD-1, there's also a recovery program on CompuServe, or you can use* TS-RANDOM *from Club 100 (see their advertisement in this issue) to do the same thing on the 100K disks.*

-TK

INFO SELECT SCORES AGAIN!

In the March '91 THE IDEA BOX, I particularly enjoyed Mike Daigle's open letter to Ed Juge—golly, but it's been a long time since I talked to Ed—enjoyed it so much I went out and bought a copy of *Info Select!*

Harry Brawley
Sigea Systems, Inc.
19 Pelham Road
Weston, MA 02193
(617)647-1098

The user-selected modular design is a stroke of genius

Welcome to the club, Harry! Info Select *is right up there on my "Official Nuge Must-Have Software List." Your* Telecommuter *(makes MS-DOS machines as easy to use as Model T's) and* X-TEL *(makes 'em easy to use with Model T's) are on that list, too. Which is why I've printed your address and phone number in an absolutely shameless plug for your products.*

-MN

GENIUS TO GENIUS

TEXT+ (March '91) by James Yi is, next to *Super ROM*, one of the most useful enhancements to my Model 100. Other readers will be interested to learn it is also completely compatible with, and enhances, the *Write* function in *Super ROM*.

The user-selected modular design is a stroke of genius for a limited RAM environment. I wish I could substitue James' search and replace function for the one in *Super ROM*, as it is far superior. On the other hand, I appreciate not having to duplicate in RAM a function already in my ROM. In my opinion, text entry convenience with TEXT+ on my M100 now exceeds that of WordPerfect on my PC clone. Thanks for a great contribution, James!

Ronald A. Cameron
Upper Darby, PA

And speaking of great contributions, Ron, your "Super FAX It with Super ROM*" (July '89) was another "stroke of genius." How about an update to reflect the latest changes in CompuServe's fax format? Thanks!*

-MN

ROAD WARRIORS, UNITE!

I am writing an article for ACTS (Association for Computer Training and Support) about the problem of high-tech road warriors using laptops in low-tech hotels. We are looking for several corporate laptop users who would be willing to be quoted. ACTS is lobbying the nation's hotel chains to upgrade and label the modem capacity at their properties. If you'd care to share your thoughts and experiences, please contact me. Thank you.

Elliott Masie
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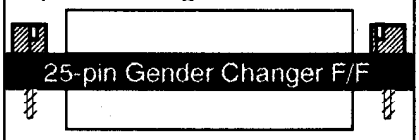

9-pin M/M or F/F $12.00ea
25-pin M/M or F/F $15.00ea

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CRUNCH, CRUNCH, CRUNCH!

Let's hear it for the number crunchers. We hear all the time about the fantastic word crunching programs in *Portable 100* (search every file for that word, phrase, or quote that you can't remember!). What about those of us who use the 100 for computational program module development? I don't see any activity for us number crunchers.

The Model 100 is just the thing to work out the details of an optimization routine while riding the bus to and from work. No unpacking, no lifting the screen. Just pull out, turn on, and punch the keys.

I hear all those smart programmers out there knocking *BASIC*. Granted, it is slow, and the Model 100 version does not come close to *Quick BASIC* in versatility, but it has good, simple data input capability (all ASCII!), good number crunching capability, a default to double precision, good algebraic notation conversion, simple editing, simple number/character output structures (i.e., *PRINT USING*), and good, quick debug capability (*F8* and *F4* sure beat my PC at work). After having to deal with four different word processors at work, the dumb, simple *TEXT* editor in the Model 100 is appreciated.

If one approaches the coding with a structured programming approach, and accounts for all the logical branch ends and data input variations, the module will probably work as intended. One does not need the *Pascal* type languages to force structure.

The Model 100's 14-decimal digit, double precision default, with a range from 1.E-64 to 1.E+62 simplifies a lot of coding. For accounting programs, I have had to use double precision to ensure accuracy to seven digits. With moderate additions, subtractions, and multiplications, about two digits are lost off the low end.

The built-in functions appear to be reasonably accurate, but there are exceptions. For example, I have noticed the *EXP(X)* is only accurate to about 4.E-07 percent when *X* is negative and whenever the first two non-zero digits of the result are between 25 and 10. When *X* is positive, *EXP(X)* appears to be accurate to within 1.E-11 percent. It would be nice to have calibration maps of all the Model 100 functions.

The built-in functions appear accurate, but there are exceptions.

The Model 100 is fully capable of doing a lot of involved computations with precision (except the "traveling salesman" problem). I have developed a lot of statistical and engineering programs over the years on the Model 100, and still use it for program development. I would be more than willing to write some of them up for *Portable 100*, if there was some interest.

David A. Heiser
Carmichael, CA

I'm sure interested. David. [How about you, P100 readers?]

-MN

GET YOUR SHOTS HERE

Since you've switched to the new format, including cheaper paper, the magazine is better than ever and getting better with each issue. I was about to give up on my 102 and your magazine, but what a shot in the arm you've given me. Keep up the good work!

Jim Bartholomew
Columbus, OH

Thanks, Jim! Letters like yours make me feel positively innoculated!

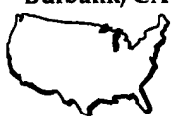
-MN

GETTING TO KNOW YOU

Congratulations on your new direction for *P100*! I'm late to the 100/102 game, but like so many others, I'm using another platform (Macintosh) as well as the 102. I still hope the 100/102 coverage continues. I'm having fun learning to use, and finding uses for, the 102. And I'm trying to do my part in supporting your advertisers (when I get spending money).

Incidentally, I look forward to Michael Daigle's THE IDEA BOX. Please keep it coming! A great letter from Prof. Hendriks (INPUT/OUTPUT, March '91), great responses from both Michaels. I know THE IDEA BOX better now, as well as *P100*, and the people behind them.

Rodney A. Kaneshiro
Burbank, CA



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WRITE ROM is the definitive word processing extension for the Model 100. PCSG produced the first text formatter for the Model 100, now sold by Radio Shack as Scripsit 100. Now, 18 months later, PSCG introduced WRITE ROM. Those who have experienced it say WRITE ROM literally doubles the power of the Model 100.

WRITE ROM — as its name implies — is on a snap-in ROM. You simply open the little compartment on the back of the Model 100 with a quarter and press WRITE ROM in. It's as easy as an Atari game cartridge. You can use other ROM programs like Lucid whenever you wish.

WRITE ROM lets you do every formatting function you'd expect, like setting margins, centering, right justifying and creating headers and footers. But it does them under function key control.

WRITE ROM remembers your favorite format settings so you can print a document without any setup, but you can change any formatting or printing parameter instantly with a function key.

WRITE ROM's "pixel mapping" feature shows you an instant picture on the screen of how your printout will look on paper.

In all there are 64 separate features and functions you can do with WRITE ROM, and some of these features are truly breakthroughs for the Model 100.

First, WRITE ROM lets you do search and replace. Any word or phrase in a document can be searched for and replaced with any other phrase where the search words appear.

Second, WRITE ROM lets you send any text (formatted or not) to any other computer over the phone with just a function key. What's more, it dials and handles sign-on and sign-off protocol automatically.

Third, WRITE ROM has a wonderful feature called Library that lets you record favorite phrases, words or commonly used expressions (often called boilerplate).

Any place you wish Library text to appear you just type a code. WRITE ROM automatically inserts the text just like a Xerox Memory Writer. Picture what you can do with that kind of capability.

WRITE ROM is blindingly fast. No one can claim faster operation. Because it is on ROM it uses virtually none of your precious RAM. It works with any printer, serial or parallel. You can make a duplicate copy of a document file under a new filename. Rename or delete (kill) any RAM file with function key ease.

This description only scratches the surface of this amazingly powerful piece of software. Dot commands allow control of such things as margins, centering, line spacing and other changes in the middle of a document. Most are WordStar™ compatible.

A mailmerge feature allows you to send the same document to every name on your mailing list, personalized for each recipient.

WRITE ROM enables you to do underlining, boldface and correspondence mode as well as any other font feature like superscripts that your printer supports, in a way that many users say "is worth the price of the program."

To underline you don't have to remember a complicated printer code. You just type CODE u, and to stop underline, CODE u again. The CODE key is to the right of your spacebar. Boldface? CODE b to start and stop. Easy to remember and do. Five different printer features of your choice.

We couldn't list all the features here. For example, you can select not just double space but triple or any other. You can use your TAB key in a document. WRITE ROM allows you to undent. This means you can have paragraphs with a first line projecting to the left of the rest of the paragraph. WRITE ROM has a feature unique for any word processor on any computer. It's called FORM. FORM is an interactive mechanism that lets you create screen prompts so that you or someone else can answer them to fill out forms or questionnaires.

With FORM, any place that you had previously typed a GRAPH T and a prompt in a document, WRITE ROM will stop and show you that prompt on the screen. You can type in directly on the screen and when you press F8 you see the next prompt. It goes to a printer or a RAM file.

Think how you can use FORM. A doctor or nurse could use it for a patient's history with each question appearing on the screen. An insurance salesman could use it for his entire questionnaire. You could construct a series of prompts to answer correspondence, typing the answers, even using Library codes. This feature lets you answer letters in rapid-fire fashion, each with personalized or standard responses.

Before WRITE ROM you had to be a programmer to create a series of prompts. Now it's as simple as GRAPH T.

PSCG makes the claim that WRITE ROM is the easiest, fastest and most feature-rich formatter for the Model 100. We're happy to offer WRITE ROM because it expands the 100 to a dimension of text processing you cannot equal on even larger computers.

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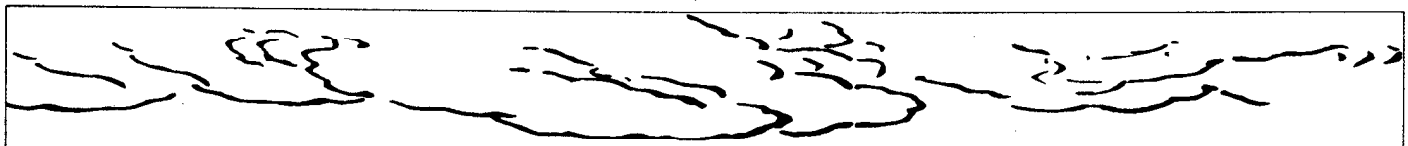

The Portable Office II

(Part II: Software—The Soul of My New Machine)

Last month, I revealed the reasons that I've "parked" my beloved Model T and began using Farfel (my new 1100FD) in its place. I also went on to list some of the support hardware and accessories that I carry with me to comprise the Portable Office II.

This month, I'd like to share some specific software recommendations with you; I was also going to pass along some strategies that I've learned (sometimes painfully) along the way, but a quick word count shows me that we'll have to cover that ground next month.

The single most important piece of software that I use is the software that lets me turn my thoughts into words on the computer. I used to use a word processor to accomplish this, but I've found something better: a text editor called *Qedit*.

WRITIN'

A text editor differs from a word processor in that a text editor is usually smaller, faster, and not as concerned with formatting and other output considerations as a full-blown word processor. While not too hot for extras like printing, spell-checking, and outlining, text editors can be perfect for pure, undistracted writing.

Qedit is a shareware program from a company called Semware. It's a remarkable little (and I do mean little) program that just may be the Swiss Army knife of software. I use its easy line drawing abilities to create my own forms. I keep my Rolodex as a *Qedit* file. I use it to write my e-mail. And ad copy and articles and fiction. I use it as an electronic notepad. And more.

Even though it's a text editor, this program has many features more commonly associated with word processors, including drop-down menus, word wrap, and a help function.

Qedit itself is a single file of less than 50K. There are no overlays or other files required to run it. This means that once you load it, it won't access the drive again until you tell it to (with, for example, a load or save command). On your laptop, this translates into more operating time per charge. A 50K file also means more room on your disk for files or other applications—and that means fewer disks to carry when you travel.

The program is horribly fast. It loads all of itself into RAM, and seems to run at the speed of thought. Moving within a document, jumping from one end to the other, even flicking between multiple documents happens instantaneously. Multiple documents? You bet—*Qedit* allows you to load into available RAM up to eight files at once, with the ability to flick from one to another at will.

Files are saved as ASCII and, as such, can later be imported into any modern word processor, sent directly as e-mail, or transferred to other machines like Macs and Model T's. These files can also be conveniently viewed with tools like *List* or *Xtree*'s file viewer or DOS's own feeble *TYPE* command. You can even just dump them directly to a printer from the command line without loading any program first.

It's possible just to play with *Qedit* a few minutes, check out the help screen, and become pretty good at using it without ever reading the docs—but don't do it. You'd be cheating yourself. By learning what *Qedit* is really capable of, you can unleash the hidden power of this remarkable program in ways that will surprise you. I'll cite some specific examples next month when we cover strategies.

SHAREWARE
All shareware listed here can be downloaded directly from CompuServe.

Qedit
SemWare
4343 Shallowford Road
Suite C-3
Marietta, GA 30062-5003
(404)641-9002
(404)641-8968 (BBS)
(404)640-6213 (Fax)
Registration: $54.95 & $3.00 S&H

List
Vernon D. Buerg
139 White Oak Circle
Petaluma, CA 94952
CompuServe: 70007,1212
Registration: NO FEE to individual users!

Blockcur
Soapbox Software
PO Box 17998
Boulder, CO 80308
Registration: $10.00

COMMERCIAL SOFTWARE
Current versions of these programs are available from most major software stores and mail order software outlets. Contact the companies directly for information on obtaining older (and smaller) versions.

Xtree
Xtree Company
4330 Santa Fe Road
San Luis Obispo, CA 93401
(800)551-5353 in CA
(800)634-5545 other US

Norton UnErase
(Part of *Norton Utilities*)
100 Wilshire Blvd.
Ninth Floor
Santa Monica, CA 90401-1146
(213)319-2000
(213)458-2048 (Fax)
MCI Mail: 226 1839

List of software and how to get it, so you, too, can pack your portable with the power of the PORTABLE OFFICE II.

READIN'

What *Qedit* is to writing, *List* is to reading. *List* is also distributed as shareware and, like *Qedit*, is also remarkable. Operating as a single 22K file, *List* is a file viewer that literally has too many features to mention here. In fact, describing *List* as just a file viewer is like describing Rebecca DeMornay as "cute."

List can be used to view files up to 500 megabytes. Yes, 500 megabytes. It lets you look at a file at your own pace. You can scroll backwards and forwards, page up and down, jump from beginning to end, go directly to any line number you want, and even have the computer scroll the text automatically on the screen at whatever speed you set.

You can search for words. You can set up to ten bookmarks in a document and jump between them at will. You can mark blocks of text to be printed or appended to a new file of their own. And believe me, this doesn't even scratch the surface of what *List* is capable of.

RECKONIN'

A common problem with laptops is keeping track of the diminutive cursor. Shareware comes to the rescue again with a wonderful little 5K gem called *Blockcur*. This clever utility can be called from your *AUTOEXEC.BAT* file to pro-

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June		OUT							
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vide you automatically with a large flashing block of a cursor that easily can be found anywhere on an LCD screen. It's amazing the difference 5K can make.

ROUNDIN' IT OUT

A couple of commercial utilities round out my list of "must have" programs.

Need to know what's on your disks? *Xtree* is the answer. *Xtree* is actually a hard drive file manager, but the original version is a single file only 43K in size. This comprehensive utility gives you complete control over your floppies, letting you copy, move, delete, and otherwise manipulate your files to your heart's content. All this happens with point-and-shoot simplicity.

Xtree divides your screen into several windows. One shows a visual image of your subdirectory structure; another shows the actual contents of each subdirectory; yet another provides relevant statistics. All available functions are listed along the bottom of the screen. I've been using *Xtree* for almost as long as I've been using DOS-box machines. It is powerful, bugless, and one of the most valuable items in my toolkit.

Peter Norton has built his career on knowing far more about computers and hard drives than mortal man was ever meant to know. His best-selling collections of utilities are invaluable. Of the utilities in the *Norton Utilities 4.5* collection, one of my favorites (and one I would not leave home without) is *Quick Unerase.*

This is a 19K life insurance policy for your files. Did you accidentally erase the wrong file? Well, it's gone but not forgotten—at least, not until you overwrite it with something else. With *Quick Unerase,* bringing back a file from the great beyond is a piece of cake. This has bailed me out of deep doodoo more than once.

Did you erase the wrong file?

I also give up 8K of disk space to DOS's own *Vdisk,* which I use to set up a 128K ramdisk as drive D on some of my disks. Why do I do that? More on that next month.

Last but not least, we come to telecommunications. I've been using *Procomm Plus 1.1b,* but I've just begun looking at some shareware called *Telix.* Both are highly recommended—I'll let you know my personal preference somewhere down the road.

LEAN AND GREEN

There you have it. In my day-to-day use of Farfel, I can get by quite well carrying just three disks. One for writing, one for telecommunications, and one for overflow file storage and large captures during telecom sessions. And that's just how I like to travel: lean, mean, and green-screened.

One final word here on the subject of shareware. I know a lot of users who wouldn't dream of using any piece of shareware, citing the "fact" that if a program were "good enough," it would be marketed commercially. Horse pucky.

True, most shareware is crap. Most commercial software is crap. So is most television. So is most fast food. As the saying goes, 90 percent of EVERYthing is crap. Finding the exceptions to this rule is one of life's joys.

Programs like *Qedit, List,* and *Blockcur* are elegant little jewels of programming, working tributes to the very nearly lost art of writing tight and elegant code. These compact tools are as smooth, seamless, and versatile as the best of commercial software. You can't judge a book by its cover, and you can't judge a piece of software by its box.

Next month: laptop strategies.

by Michael Daigle

COMPATIBILITY: Model 100, 102; Tandy 200 and others, with changes.

Gentlemen, Start Your Engines!

Model 100 aids vintage road racer.

by William M. Lowerre, Jr.

Halfway through the 1959 season, I earned my Sports Car Club of America license to drive in the national races. By the end of the season, I was second in national points in class H, Production. During that time we used a clipboard with three stop watches and a single lever that pressed all three watch crowns at once, so that one watch stopped at the end of a lap, one reset to zero, and one started, to obtain simple lap times repeatedly for one car, usually mine. We needed a scratch pad and some mental agility with numbers to perform the addition to determine the cumulative lap times.

Sometimes we borrowed a "time study" watch with a "split" (or dual) second hand to time the car. On this watch, the dual hands traveled together until the crown was pressed. Then one second hand kept running, while the other would stop so that you could read and record the cumulative lap time from the beginning of the race.

We used a clipboard with three stop watches and a single lever that pressed all three watch crowns at once.

When the crown was pressed again the stopped hand would catch up to its still moving partner. Again, we needed a scratch pad and some mental agility with numbers to perform the subtraction to determine the individual lap times. We preferred to use both methods simultaneously to eliminate the arithmetic and get both cumulative and simple lap times.

In 1960, following a sixth place overall finish at Sebring behind the likes of Stirling Moss, I sold the car and went to work to make an honest living.

A LONG PIT STOP

Twenty some years later in 1983, I had a chance to buy another Deutsch-Bonnet. It was a 1961 where my original had been a 1959. However, they were both model HBR-850 coupes

```
5 'RACER.BA Copyright 1991 by Wm M Lower
re Jr. Rev 7/16/91
6 'ESC terminates; CTRL Q Exits
1Ø DEFINTC,I,J,L,N,T:DEFSNGU,V:DEFSTRM:G
OTO12Ø
31 I=1:GOTO5Ø
32 I=2:GOTO5Ø
33 I=3:GOTO5Ø
34 I=4:GOTO5Ø
35 I=5:GOTO5Ø
36 I=6:GOTO5Ø
37 I=7:GOTO5Ø
38 I=8
5Ø IFI>CTHEN8ØELSEKEYOFF:SOUND2348,5:M=T
IME$:TC=6Ø*VAL(MID$(M,4,2))+VAL(RIGHT$(M
,2))
55 L(I)=L(I)+1:IFL(I)>LTHENL(I)=L:GOTO2Ø
ØØ
6Ø PRINT@2Ø*I+6Ø,"#";N(I);"Lap";L(I);
7Ø TC(I,L(I))=TC:PRINT"- ";:PRINTUSING"#
.###";(TC-TC(I,L(I)-1))/6Ø
8Ø RETURN
9Ø KEYON:ONKEYGOSUB31,32,33,34,35,36,37,
38
92 A$=INKEY$:IFA$=""THENA$="A"
93 IFASC(A$)=27THEN2ØØØ
94 GOTO9Ø
12Ø INPUT"Enter max number of laps";L
121 INPUT"Number of cars timed";C:IFC>8T
HEN121
125 DIMTC(C,L),L(C),N(8),I,M,TC,L,MBR
13Ø PRINT"Enter ";C;"timed car numbers":
FORI=1TOC:INPUTMBR:N(I)=VAL(MBR):KEYI,MB
R:KEY(I)ON:NEXT
14Ø IFC<8THENFORI=C+1TO8:KEYI,A$:KEY(I)O
N:NEXT
```

Continued.

Listing 1. RACER.BA converts your Model 100 into twenty-four stop watches!

and very similar.

I had the engine rebuilt by Jack Skene of Cloverdale, Indiana, for street use. I had no intention of racing. However, in the summer of '86, I decided to take it to the Pittsburgh (PA) Vintage Grand Prix, sponsored by the Vintage Sports Car Club of America, of which I became a member. I hadn't raced since 1960 and, not too surprisingly, I did not do very well in practice. As a result, I was 26th out of 28 on the starting grid.

However, during practice I must have grown accustomed to the heat caused by the new fireproof underwear, and to the lack of noise caused by the new brain bucket that boxed my ears in solid plastic. In the race, which included cars with displacements over twice that of my D-B, I moved from 26th place to finish in 16th place. I was quite pleased. I had no pit crew and found no use for the stopwatch I had taken with me.

The next year, 1987, I entered the race at Watkins Glen (NY) sponsored by the Sports Vintage Racing Association, and placed 3rd in my group, even though I was put in a faster group than the other DB/Panhards of Andre Garnier and Dennis Skitzki. This time I had a crew, and we used the modern, digital electronic equivalent of the old split second hand watch. We calculated my simple lap times after each practice session and after the race. It was informative, interesting, and helpful to see the measured improvement from session to session.

It was also helpful to see the difference in lap times as I tried different cornering techniques, and made various mistakes. For example, on one lap I bobbled turn number 1 at the end of the pit straight by diving in too far before braking, and it had a noticeable impact on my lap time.

My third place success encouraged me to think in terms of further vintage racing, and I felt I would need a modern version of the three-watch, single-lever clipboard and split second hand watch combination. What better way than to program the trusty 100 for the job? So I went to work.

A BETTER IDEA

Now, selection of *RACER.BA* from the main menu results in a question asking for the minimum number of laps to be run and of the number of cars to be timed—up to eight maximum. You can then enter car numbers (or colors) in any sequence, and they appear on the screen as function key labels.

It's like having eight clipboards with three watches each!

You then tap the *ENTER* key at the drop of the green flag, starting the clock. Pressing the appropriate function key, as each car laps the track and recrosses the start/finish line, records the lap time for that car. Lap times are printed to the screen as they are recorded. The last lap number and time is displayed simultaneously for each car number. Wow, it's like having eight clipboards with three watches each!

When the race is over and the winner's—or anyone else's—cooldown lap has been timed, the clock stops and the screen presents three reports: one comparing average race lap times, the second displaying cumulative lap times for the entire race, and the third showing the full

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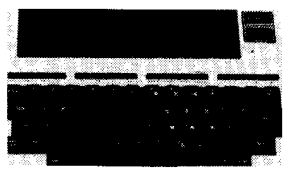

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Circle 141 on reader service card.

set of simple lap times for each car. Reports increment and then recycle when you give an upper or lower case Y response to the question *Next (Y/N)?* Pressing the *PRINT* key provides a hardcopy of each screen on my portable printer.

The data arrays are not saved to a file. To avoid accidental or unintentional loss of the data before printing, you have to press the *CTRL* and *Q* keys simultaneously (*CTRL-Q*) to quit and exit the program. On *CTRL-Q*, the program goes to a subroutine to reset the function keys and then calls the main menu. This is a far cry from the three-watch clipboard that would give simple lap times for only one car, and the split second hand watch that would give only cumulative lap times for one car

```
16Ø CLS:SCREENØ,1:PRINT"During race:
161 PRINT:PRINT"  1) Tap F# key as car c
rosses line."
162 PRINT"  2) ESC or F# for cooldown la
p ends."
17Ø PRINT:INPUT"Now, when race starts ta
p <ENTER>.";A$:M=TIME$:TC=6Ø*VAL(MID$(M,
4,2))+VAL(RIGHT$(M,2)):FORI=1TOC:TC(I,Ø)
=TC:NEXT:CLS:PRINT@1Ø,"RACER by Wm. Lowe
rre":GOTO9Ø
2ØØ PRINT@3Ø8,"Next (Y/N)?";:A$=""
21Ø B$=INPUT$(1):IFASC(B$)=17THEN5ØØØELS
EIFB$<>"y"ANDB$<>"Y"THEN2ØØELSECLS:RETUR
N
2ØØØ SCREENØ,Ø:CLS:FORI=1TOC
2Ø1Ø VG(I)=(TC(I,L(I))-TC(I,Ø))/L(I)/6Ø
2Ø2Ø PRINTUSING"###";N(I);:PRINT" Avg ";
:PRINTUSING"#.###";VG(I);:PRINT" min.";:
IFI<CTHENPRINT
2Ø3Ø NEXT:GOSUB2ØØ
25ØØ CLS:FORI=1TOC
251Ø UM(I)=(TC(I,L(I))-TC(I,Ø))/6Ø
252Ø PRINTUSING"###";N(I);:PRINT" Cum ";
:PRINTUSING"###.##";UM(I);:PRINT" min.";
:IFI<CTHENPRINT
253Ø NEXT:GOSUB2ØØ
3ØØØ CLS:FORI=1TOC:PRINTUSING"####";N(I)
;:FORJ=1TOL(I):PRINTUSING"##.##";(TC(I,J
)-TC(I,J-1))/6Ø;:NEXT
3Ø1Ø IFL>7ANDL<16THENIFINT(I/4)=I/4THENG
OSUB2ØØ
3Ø15 IFL>15ANDL<32THENIFINT(I/2)=I/2THEN
GOSUB2ØØ
3Ø2Ø IFL>31THENGOSUB2ØØ
3Ø25 PRINT
3Ø3Ø NEXT:GOSUB2ØØ:GOTO2ØØØ
5ØØØ 'labels
5Ø1Ø KEY1,"Files"+CHR$(13)
5Ø2Ø KEY2,"Load "+CHR$(34)+"
5Ø3Ø KEY3,"Save "+CHR$(34)+"
5Ø4Ø KEY4,"Run"+CHR$(13)
5Ø5Ø KEY5,"List"+CHR$(13)
5Ø6Ø KEY6,"Edit "+"
5Ø7Ø KEY7,"Cont"+CHR$(13)
5Ø8Ø KEY8,"Menu"+CHR$(13)
5Ø9Ø MENU
```

End of listing.

THE PLAY-BY-PLAY

The programming is not tricky, no *PEEK*'s, *POKE*'s or *CALL*'s. Line 10 defines the variables as integer, single precision, and string, and jumps to line 120. Lines 120 and 121 ask for the number of laps (*L*) and number of cars (*C*) to be timed. Line 130 asks for the car numbers to be timed and sets up the function keys. Lines 160-170 provide on-screen operating instructions.

Line 170 initializes the clock for each car at the start by placing the numeric value of *TIME$* in the lap (0) cell of array *TC(C,L)*. The program then goes to line 90. Lines 90-91 set up an endless loop until you press a function key, at which time the program goes to one of eight subroutines at lines 31-38, depending on the car number/function key, where it provides the subscript identifying the car.

Line 50 tests for an invalid function key, which it ignores if you press one. If you press a valid function key, it rings the bell, the current time recorded and converted to integer time in seconds. The lap is incremented for the appropriate car in line 55. Lines 60-80 print car number and lap time to the screen and return to line 90 to await the next function key depression. The array *TC(C,L)* is updated in line 70.

If you indicate a cooldown lap in line 50, then the program goes to the reporting routines at 2000-3030. Line 2000 turns off the function key labels so the full screen is available for reported data. Lines 3010-3025 ensure that individual lap time data is presented one screen at a time, regardless of the number of laps and the number of cars timed. Lines 5000 through 5080 reset the labels to standard. I've also added a couple of my favorites to function keys *F6* and *F7* in lines 5070 and 5080, which you may delete or revise.

Unfortunately, the program does not seem to have made my car faster.

I may ultimately make some minor changes to save the data to a RAM file for permanent retention, though use of a portable printer makes such a capability unneeded. I probably will not revise it to handle laps over 9.999 minutes, nor races over 999.999 minutes, since this accommodates all reasonable lap times and most race durations. I do plan to upgrade it so it displays the report screens during the race

We first used this version of *RACER.BA* at the Pittsburgh Vintage Grand Prix in 1989. Unfortunately, the program did not seem to have made my car much faster, and Andre beat me. Dennis didn't, however; he had apparently quit racing and wasn't there.

Everything worked well in '90, and I was second under one liter, beating the DB's of Andre and Harry Schneider, and garnering the engraved plaque presented by the President of the French Le Amis de Panhard auto club for the best French car under one liter. I apparently had the only team at the track with a Model 100.

COMPATIBILITY: Model 100/102.

PIXIE: A Miniature Character Set for Model 100/102 Graphics

Put tiny text on your screen—even if you don't program in assembly language!

by G. W. Flanders

Given the coarse resolution of its small screen, the Model 100/102's bit graphics are quite satisfactory. You can easily develop good charting routines within the confines of the 2 x 7.5-inch LCD display. The trouble comes in finding room on the screen for text callouts.

Unlike the *LINE* and *PSET* commands, which have access to all of the LCD's 15,360 pixels, normal text characters are confined to 320 predefined spaces on the screen. Those normal characters each have a whopping 6 x 8-pixel footprint, usurping much valuable charting space. But wouldn't it be great to produce legible callouts that wouldn't eat up such large chunks of LCD real estate?

Enter *PIXIE*—a fairly short (364-byte) machine language program activated by simple *BASIC* commands incorporated into graphics programs. *PIXIE* reads text strings and prints them in miniature characters where you want them.

PIXIE reads text strings and prints them in miniature characters where you want them.

PIXIE characters are proportionally spaced, so although most characters are three pixels wide, some are more (such as *M* and *W*) or less (such as *I* and *1*). They stand only five pixels tall, except for the descenders on commas and semicolons. The miniature callouts are two-thirds or less the size of standard text.

PIXIE's character set supports ASCII values 32 through 94—capital letters, punctuation, and math operational signs—everything most applications require.

FOR PROGRAMMERS AND NON-PROGRAMMERS

Listing 1 is the annotated assembly language source code for the machine language. *PIXIE* is *ORG*'d at hex $DFCC (57292 decimal) so it fits ahead of my screen dump utility *DUMP.CO* (see *Portable 100*, May 1990). If you don't intend to use the two

```
String: Making tiny text callouts is eas
y with PIXIE!

MAKING TINY TEXT CALLOUTS IS EASY WITH PIXIE!
```

A sample Model 100 display of the Pixie *characters.*

```
Ø CLEAR256,57292:FORI=57292TO57649:READD
:POKEI,D:NEXT:SAVEM"PIXIE",57292,57649:M
ENU
1 DATA126,245,35,126,5Ø,46,225,35,126,5Ø
2 DATA47,225,42,46,225,229,225,241,183,2
ØØ
3 DATA61,245,2Ø5,232,15,35,229,254,95,21
Ø
4 DATA22Ø,223,214,31,95,33,121,224,35,12
6
5 DATA254,128,218,242,223,29,194,242,223
,23Ø
6 DATA127,35,229,2Ø5,19,224,193,1Ø,3,197
7 DATA254,128,21Ø,99,224,2Ø5,19,224,195,
4
8 DATA224,71,23Ø,1,2Ø2,31,224,2Ø5,1Ø6,22
4
9 DATA2Ø5,116,224,12Ø,23Ø,2,2Ø2,43,224,2
Ø5
1Ø DATA1Ø6,224,2Ø5,115,224,12Ø,23Ø,4,2Ø2
,55
11 DATA224,2Ø5,1Ø6,224,2Ø5,114,224,12Ø,2
3Ø,8
12 DATA2Ø2,67,224,2Ø5,1Ø6,224,2Ø5,113,22
4,12Ø
13 DATA23Ø,16,2Ø2,79,224,2Ø5,1Ø6,224,2Ø5
,112
14 DATA224,12Ø,23Ø,32,2Ø2,91,224,2Ø5,1Ø6
,224
15 DATA2Ø5,111,224,42,48,225,36,34,48,22
5
16 DATA2Ø1,193,2Ø5,91,224,195,22Ø,223,42
,48
```

Continued

Listing 2. If you don't have an assembler, LOADER.BA *creates the* PIXIE.CO *program.*

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```
17 DATA225,235,201,28,28,28,28,28,197,20
5
18 DATA76,116,193,201,192,151,131,64,3,1
38
19 DATA31,10,31,10,130,21,31,21,8,137
20 DATA4,18,138,21,10,8,131,142,17,145
21 DATA14,138,4,10,132,14,4,176,132,4
22 DATA4,144,136,4,2,142,17,14,130,31
23 DATA153,21,18,145,21,10,140,10,31,151
24 DATA21,9,159,21,29,129,29,3,159,21
25 DATA31,151,21,31,138,180,132,10,17,13
8
26 DATA10,10,145,10,4,129,21,2,137,21
27 DATA14,158,5,30,159,21,10,142,17,17
28 DATA159,17,14,159,21,17,159,5,1,142
29 DATA17,29,159,4,31,159,136,16,15,159
30 DATA4,27,159,16,16,159,2,4,2,31
31 DATA159,2,4,31,159,17,31,159,5,2
32 DATA159,17,31,16,159,5,26,146,21,9
33 DATA129,31,1,159,16,31,143,16,15,143
34 DATA16,12,16,15,155,4,27,131,28,3
35 DATA153,21,19,159,17,130,4,8,145,31
36 DATA130,1,2,128,0,0,0,0
```

End of listing.

programs together, and don't use a Chipmunk drive, you may want to reassemble this source at a higher address.

For users who don't want to fiddle with assembling and/or relocating the source code, Listing 2 is a *BASIC* loader program that creates and installs *PIXIE.CO*.

HOW *PIXIE* WORKS

Let's examine the assembly language source code to understand what happens when *PIXIE* is called. On entry to the routine, the desired X-Y coordinates (where you want the miniature text to appear) has to be *POKE*d into the buffer *COORD*, located in RAM at addresses 57648 and 57649. Likewise, information on the original text string has been passed by the *CALL* statement.

```
10 CLEAR256,57292:LOADM"PIXIE"
11 CLS:LINEINPUT"String: ";HL$:HL=VARPT
R(HL$)
12 POKE57648,32:POKE57649,0
13 CALL57292,,HL
14 I$=INKEY$:IFI$=""THEN14ELSEIFI$=CHR
$(27)THENMENUELSEI$="":GOTO11
```

End of listing.

Listing 3. DRIVER.BA *lets you take* PIXIE.CO *for a demonstration "test drive" and illustrates how to load and call* PIXIE.CO *from your own programs.*

Just a word about the *CALL* statement. When a machine language (m/l) routine is called, one or two arguments can be appended to the statement. For example: *CALL addr,byte,word.* This syntax means go to the m/l instruction at *addr*, preloading a *byte* (0-255) into the accumulator register (which *PIXIE* ignores) and a *word* (0-65535) into the HL register pair (which *PIXIE* requires). Thus, when *PIXIE* is called, the HL register pair points to the *VARPTR* of the desired text string.

The source code starts by moving the first byte HL points to into the accumulator. That byte represents the length of the string. It places that length on the stack for future reference. Then it increments the HL pointer twice, getting the actual string address and storing it in the buffer *STRNG*.

PIXIE next examines the string character by character. Lower case letters are converted to upper case by the ROM routine at

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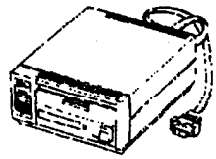

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$0FE8. *PIXIE* also rejects characters with ASCII values greater than 94, not supported by its character set. As it finds each valid character, it subtracts decimal 31 from the ASCII value. In this way, it can count the number of shapes in *PIXIE*'s character table, indexing to the one that corresponds to that character.

Borrowing a trick from ROM, each shape begins with a byte with its high bit set (i.e., the value is at least 128). The counter is decremented each time such a value is detected, so that when the counter reaches zero it has also arrived at the start of the correct shape.

The miniature callouts are two-thirds or less the size of standard text.

The program adjusts the value of the first shape byte by *AND*ing it with 127, and places it on the screen. It knows when to stop reading bytes for a shape when another byte arrives with its high bit set, denoting the beginning of the next shape.

As it cycles through the shape bytes, it discovers which vertical pixels to set by successively *AND*ing the value with 1, 2, 4, 8, 16, and 32. If the result is zero, it skips to the next. If the result is non-zero, indicating that the pixel should be set, it calls a routine to set it, adjusting for vertical position by incrementing the E register until it arrives at the proper vertical pixel.

After each shape byte, it increments the horizontal coordinate, leaving a blank pixel between letters. It continues until the original text string is reproduced in miniature on the screen.

HOW THE DRIVER WORKS

Listing 3 contains commands you can use to drive *PIXIE*. Line 100 defines *HIMEM*, beyond which m/l is protected from *BASIC*. Then it loads *PIXIE* into RAM, ready to be called. Line 110 asks you to type in a string to test the m/l routine. In place of this in another program would be the definition of a string you want as a callout on your graphic screen.

Bear in mind that you can designate any string your program has defined, and that you can call the *PIXIE* routine as many times as you wish. In this example, I've named the string *HL$* and let the numeric variable *HL* equal *VARPTR(HL$)*.

PIXIE borrows a trick from ROM.

Line 120 pokes the starting X-Y coordinates of the miniature string into the buffer *COORD*. In your application, you supply whatever X-Y coordinates that suit your screen.

Line 130 passes program control to *PIXIE* by making the call and supplying arguments: *CALL 57292,,HL*. The first argument, *57292*, is *PIXIE*'s starting address. The second argument, used to load the accumulator, is a null created by the syntax ",," because you don't need to load the accumulator for *PIXIE*. Line 130 uses *HL*, which I've defined as *VARPTR(HL$)*, in the third argument.

BASIC creates a string descriptor table, which gives information on active strings. The *VARPTR* string function finds the start of three bytes in that table, which contain 1) string length, 2) the low byte of its RAM address, and 3) the high byte. The call to the *PIXIE* routine passes *VARPTR(HL$)* to the HL register pair, as described earlier.

```
;PIXIE.SRC SOURCE CODE FOR PIXIE.CO
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       ORG    $DFCC  ;57292
       MOV    A,M    ;STRING LENGTH
       PUSH   AF
       INX    H
       MOV    A,M    ;LOW BYTE STRING ADDRESS
       STA    STRNG
       INX    H
       MOV    A,M    ;HIGH BYTE STRING ADDRESS
       STA    STRNG+1
       LHLD   STRNG
       PUSH   H
FETCH  POP    H      ;CURRENT STRING CHAR. ADDRESS
       POP    AF
       ORA    A      ;TEST FOR END OF STRING (0)
       RZ            ;EXIT ROUTINE
       DCR    A
       PUSH   AF
```

Continued.

Listing 1. Create miniaturized text for your graphics with this efficient assembly language source code for PIXIE.CO.

By line 140, the miniature string will have appeared starting at Y=32 and X=0: flush left, halfway down the display. Line 140 simply waits for you to strike a key. If you press the *ESC* key, you exit to the main menu. Any other active key cycles back to receive another string.

From this example, you should have no difficulty writing a *BASIC* subroutine that creates callouts just where you want them. But remember these two requirements: 1) you must either embed string inputs in your program or prompt for them BEFORE you start building the graphic screen; and 2) you must allow for the space requirements of the miniature string when programming their starting coordinates.

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```
       CALL   $0FE8  ;GET CHARACTER (UPPER CASE)
       INX    H      ;ADJUST STRING POINTER
       PUSH   H
       CPI    95     ;VALID CHARACTER?
       JNC    FETCH
       SUI    31     ;ADJUST OFFSET FOR SHAPE TABLE
       MOV    E,A    ;SAVE COUNTER
       LXI    H,ST-1 ;POINTER
FIND   INX    H
       MOV    A,M    ;TABLE VALUE
       CPI    128    ;BIT 7 SET?
       JC     FIND
       DCR    E      ;COUNTER
       JNZ    FIND
       ANI    127    ;START OF SHAPE FOUND
       INX    H      ;POINTER
       PUSH   H
       CALL   BIT0   ;ROUTINE TO SET PIXELS
CYCLE  POP    B      ;POINTER
       LDAX   B      ;ANOTHER SHAPE VALUE
       INX    B
       PUSH   B
       CPI    128    ;BIT 7 SET?
       JNC    DUN    ;(YES) END OF SHAPE
       CALL   BIT0   ;(NO) SET PIXELS
       JMP    CYCLE
BIT0   MOV    B,A    ;SET PIXELS IN BITS 0 THRU 5
       ANI    1
       JZ     BIT1
       CALL   LOAD
       CALL   SET0
BIT1   MOV    A,B
       ANI    2
       JZ     BIT2
       CALL   LOAD
       CALL   SET1
BIT2   MOV    A,B
       ANI    4
       JZ     BIT3
       CALL   LOAD
       CALL   SET2
BIT3   MOV    A,B
       ANI    8
       JZ     BIT4
       CALL   LOAD
       CALL   SET3
BIT4   MOV    A,B
       ANI    16
       JZ     BIT5
       CALL   LOAD
       CALL   SET4
BIT5   MOV    A,B    ;DESCENDERS ONLY
       ANI    32
       JZ     ADV
       CALL   LOAD
       CALL   SET5

ADV    LHLD   COORD  ;ADJUST X COORDINATE
       INR    H
       SHLD   COORD
       RET           ;GET ANOTHER SHAPE VALUE
DUN    POP    B      ;CLEAR STACK
       CALL   ADV    ;PREPARE FOR NEXT CHARACTER
       JMP    FETCH  ;GO GET IT
LOAD   LHLD   COORD  ;GET COORDINATES
       XCHG          ;PUT THEM IN DE
       RET
SET5   INR    E      ;MOVE TO DESIRED PIXEL
SET4   INR    E
SET3   INR    E
SET2   INR    E
SET1   INR    E
SET0   PUSH   B      ;PROTECT BC FROM PSET ROUTINE
       CALL   $744C  ;ROM PSET ROUTINE
       POP    B
       RET
ST     DB     192    ;SPACE
       DB     151    ;EXCLAMATION
       DB     131    ;QUOTES
       DB     64
       DB     3
       DB     138    ;POUND
       DB     31
       DB     10
       DB     31
       DB     10
       DB     130    ;DOLLAR
       DB     21
       DB     31
       DB     21
       DB     8
       DB     137    ;PERCENT
       DB     4
       DB     18
       DB     138    ;AMPERSAND
       DB     21
       DB     10
       DB     8
       DB     131    ;APOSTROPHE
       DB     142    ;LEFT PARENTHESIS
       DB     17
       DB     145    ;RIGHT PARENTHESIS
       DB     14
       DB     138    ;ASTERISK
       DB     4
       DB     10
       DB     132    ;PLUS
       DB     14
       DB     4
       DB     176    ;COMMA
       DB     132    ;MINUS
       DB     4
       DB     4
```

Continued.

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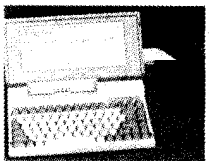

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```
        DB  144 ;PERIOD
        DB  136 ;SLASH
        DB  4
        DB  2
        DB  142 ;0
        DB  17
        DB  14
        DB  130 ;1
        DB  31
        DB  153 ;2
        DB  21
        DB  18
        DB  145 ;3
        DB  21
        DB  10
        DB  140 ;4
        DB  10
        DB  31
        DB  151 ;5
        DB  21
        DB  9
        DB  159 ;6
        DB  21
        DB  29
        DB  129 ;7
        DB  29
        DB  3
        DB  159 ;8
        DB  21
        DB  31
        DB  151 ;9
        DB  21
        DB  31
        DB  138 ;COLON
        DB  180 ;SEMICOLON
        DB  132 ;LESS THAN
        DB  10
        DB  17
        DB  138 ;EQUALS
        DB  10
        DB  10
        DB  145 ;GREATER THAN
        DB  10
        DB  4
        DB  129 ;QUESTION MARK
        DB  21
        DB  2
        DB  137 ;AT
        DB  21
        DB  14
        DB  158 ;A
        DB  5
        DB  30
        DB  159 ;B
        DB  21
        DB  10
        DB  142 ;C
        DB  17
        DB  17
        DB  159 ;D
        DB  17
        DB  14
        DB  159 ;E
        DB  21
        DB  17
        DB  159 ;F
        DB  5
        DB  1
        DB  142 ;G
        DB  17
        DB  29
        DB  159 ;H
        DB  4
        DB  31
        DB  159 ;I
        DB  136 ;J
        DB  16
        DB  15
        DB  159 ;K
        DB  4
        DB  27
        DB  159 ;L
        DB  16
        DB  16
        DB  159 ;M
        DB  2
        DB  4
        DB  2
        DB  31
        DB  159 ;N
        DB  2
        DB  4
        DB  31
        DB  159 :O
        DB  17
        DB  31
        DB  159 ;P
        DB  5
        DB  2
        DB  159 ;Q
        DB  17
        DB  31
        DB  16
        DB  159 ;R
        DB  5
        DB  26
        DB  146 ;S
        DB  21
        DB  9
        DB  129 ;T
        DB  31
        DB  1
        DB  159 ;U
        DB  16
        DB  31
        DB  143 ;V
        DB  16
        DB  15
        DB  143 ;W
        DB  16
        DB  12
        DB  16
        DB  15
        DB  155 ;X
        DB  4
        DB  27
        DB  131 ;Y
        DB  28
        DB  3
        DB  153 ;Z
        DB  21
        DB  19
        DB  159 ;LEFT BRACKET
        DB  17
        DB  130 ;BACK SLASH
        DB  4
        DB  8
        DB  145 ;RIGHT BRACKET
        DB  31
        DB  130 ;EXPONENT
        DB  1
        DB  2
        DB  128 ;END OF SHAPES MARK
STRNG   DS  2   ;ADDRESS OF STRING
COORD   DS  2   ;X-Y COORDINATES
        END
```

End of listing

COMPATIBILITY: Tandy 200. (Maybe others, but we haven't tried it!)

Just Slip Out the Back, Jack!
(Here's A New Plan, Stan.)

Add a modular telephone jack to your Tandy 200.

by Jeremy Nichols

It took me only a short time to get tired of Tandy's modem adapter cable and wish for built-in modular jacks. I first considered removing one of the connectors I don't use and putting the phone jacks in its place, but was concerned about such an obvious violation of Murphy's Law: Removing an unused connector causes a need for it.

Eventually, I found that the part of the case above the connectors was mostly empty space. After poking and prying, I decided to put the jacks in the case just above the printer connection (Photo. 1). This is how I did it and how you can, too.

WARNING

This project involves cutting holes in your T200. (You may not want to alter your computer so permanently.) The rigidity of the case is not compromised, though, and it doesn't affect any other functions in any way. You also have to solder but it's relatively easy to get at the locations to solder, so most people with a little experience should have no trouble. If you have no experience soldering, however, get a friend to help.

Removing an unused connector causes a need for it.

PREPARATION

This is the most important part of the project. If you know what you're going to do in advance, it'll go smoothly and you'll like the results. The only tools needed are simple ones most people are likely to have: screwdrivers and pliers, a hacksaw, a sharp hobby knife, and maybe a file. You'll also need a soldering iron with a small tip and some rosin-core solder. Don't use acid-core solder. It can ruin electronics.

The object is to cut a pair of holes—or perhaps they could be called notches—in the back case, and install in each notch a modular telephone jack. You'll solder a total of three wires from the two jacks to the 8-pin DIN jack labeled PHONE. That's all.

Run *JAXPIX.BA* (Listing 1). It draws a diagram of the installation process on the Tandy 200's hi-res screen. You might want

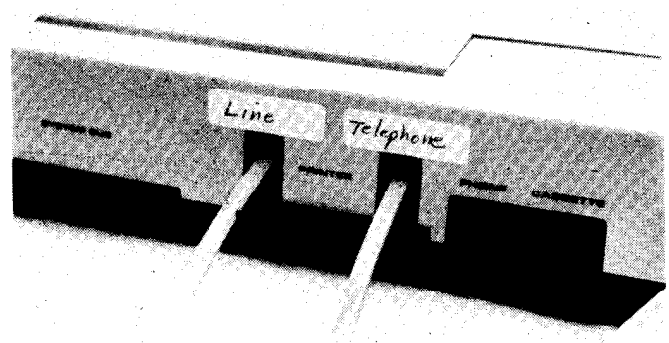

Photo 1. A back view of a modified Model 200 with both jacks installed.

```
0 'JAXPIX.200 v 2.1 by Jeremy Nichols
1 '(73527,2164)  Copyright 1989
2 'All Rights Reserved
3 'JAXPIX.200 will create a BASIC
4 'program to draw a rear view of the
5 'Tandy 200 with modular telephone
6 'jacks, including the dimensions of
7 'the notches which you must cut.
8 'For instructions download TELJAX.200
9 'Press any key to stop the program
10 CLS:SCREEN0,0
11 'Tandy 200 - rear view
12 LINE(0,12)-(200,12):LINE(0,60)-(25,60
):LINE-(25,56):LINE-(29,56)
13 LINE-(29,31):LINE-(44,31):LINE-(44,56
):LINE-(105,56):LINE-(105,31)
14 LINE-(120,31):LINE-(120,56):LINE-(124
,56):LINE-(124,60):LINE-(128,60)
15 LINE-(128,44):LINE-(175,44):LINE-(175
,60):LINE-(200,60):LINE-(200,12)
16 LINE(0,62)-(25,62):LINE-(25,70):LINE-
(124,70):LINE-(124,62):LINE-(128,62)
17 LINE-(128,69):LINE-(175,69):LINE-(175
,62):LINE-(200,62):LINE-(200,80)
18 LINE-(0,80):LINE(27,58)-(122,68),1,B:
```

Continued

Listing 1. JAXPIX.BA *produces on the Tandy 200 hi-resolution screen a diagram that shows how to put a regular phone jack on your Tandy 200.*

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to keep a copy of this diagram handy, because you may want it after you have disassembled your computer (see below, "CUTTING THE NOTCHES").

Finally, you'll be turning off all power to the computer before beginning the project. Remember to save every file you want to keep.

```
LINE(151,45)-(151,69)
19 LINE(31,33)-(42,54),1,B:LINE(1Ø7,33)-
(118,54),1,B
2Ø 'Outer notch
21 LINE(1Ø,126)-(35,126):LINE-(35,122):L
INE-(39,122):LINE-(39,97)
22 LINE-(54,97):LINE-(54,122):LINE-(64,1
22):LINE(39,95)-(39,87)
23 LINE(54,95)-(54,87):LINE(56,97)-(64,9
7)
24 'Inner notch
25 LINE(142,122)-(142,11Ø):LINE-(145,11Ø
):LINE-(145,97):LINE-(16Ø,97)
26 LINE-(16Ø,11Ø):LINE-(163,11Ø):LINE-(1
63,122):LINE(142,95)-(142,87)
27 LINE(163,95)-(163,87):LINE(165,11Ø)-(
173,11Ø):LINE(165,122)-(173,122)
28 'Text
29 PRINT @ 3,"Tandy 2ØØ Modular Telephon
e Jacks"
3Ø PRINT @2Ø9,"PRINTER"
31 PRINT@182,"FON CAS"
32 PRINT@84,"Line          Phone"
33 PRINT@612,"Outer wall";:PRINT@629,"In
ner wall";
34 PRINT@445,CHR$(154)
35 PRINT@45Ø,CHR$(155);" Ø.44 in."
36 PRINT@53Ø,CHR$(152)
37 PRINT@57Ø,CHR$(153)
38 PRINT@532,"Ø.75 in."
39 PRINT@588,CHR$(146);" Ø.4 in.";
4Ø PRINT@462,CHR$(154)
41 PRINT@468,CHR$(155);" Ø.5 in."
42 PRINT@48Ø,"Notch"
43 PRINT@52Ø,"detail"
44 B$=INKEY$:IFB$=""THEN44
45 END
```

End of listing.

PARTS

The modular jack you'll be installing is a standard RJ-11 line cord jack, part number 623P. The jack has grooves on the sides, which will hold the edges of the slot you're going to make in your Tandy 200. You would be wise to have the jacks in hand before cutting your case.

The jacks should be available from most telephone equipment manufacturers. You may have to search a bit to find a retail outlet, though. Graybar Electric is a good source for telephone parts, although they usually are wholesalers only. You may be able to sweet-talk them into selling you two jacks. Gary at the San Jose store was very helpful to me and turned out to be an M100 owner to boot!

Another option is to buy the jacks from the same place I did: Halted Specialties, 3500 Ryder St., Santa Clara, CA 95051. The 632P jack is Halted part number 9436. Like most surplus items, the supply is limited. Halted has a $10.00 minimum mail order, so you'll have to buy something else to make up the balance of the order. For a dollar they'll send you a catalog containing mostly surplus new and used electronic components, PC-XT clone kits, etc.

TAKING APART THE TANDY 200

1. Turn off the power switch.
2. Turn off the memory power switch on the bottom of the computer.
3. Remove the AA batteries.
4. Remove the cover over the LCD screen's cable and hinges. Push in at top center and slide it down (not as easy as it should be, unfortunately).
5. Remove the ribbon cable from its socket on the display's green PC board. WARNING: The black thing on the green board is NOT a plug; it's a socket! The ribbon cable has no real plug; the bare end just slides into the black receptacle. Grip the cable carefully with a thumb and finger on each side and pull it down and out of the socket.
6. Remove the four Phillips screws from the hinge assembly. longer—remember which go where!
7. Carefully lift up the LCD screen and pull it off the hinges. Put the screen away in a safe place. The metal tabs stay on the main case. Bend the tabs down in the "closed" position so they'll be out of the way.
8. Turn the computer upside down on something soft and remove the Phillips screws in the corners, which hold the top and bottom halves of the case. Don't worry about the cases falling apart; they're also held together by tabs in the plastic.
9. Turn the T200 rightside up. Carefully pry the upper half of the case up and out from the lower half with a thin screwdriver or knife. The tabs are in the middle, one on each side.
10. When all four tabs have popped, you can carefully lift the top case off of the bottom. WARNING: Don't turn the bottom half of the case over. The keyboard will fall out because it's held in only by the top case.

Now you're ready to operate. Put the bottom half aside and turn the top half upside down on your work surface.

CUTTING THE NOTCHES

Refer to the diagram from *JAXPIX.BA*. The Tandy 200's back wall is two layers thick. Conveniently, the inner wall is the exact

thickness needed to hold the modular jack.

The notches can be almost anywhere in the back wall. Logically, they should be close to the *PHONE* socket and between the "ribs" connecting the inner and outer walls. If you put one notch on either side of the word *PRINTER*, you'll have plenty of working room without destroying the *PRINTER* label.

You can cut both walls at the same time. Then carefully enlarge the inner notch to provide the correct fit for the jack. The initial cuts should be 0.44 inch wide and 0.75 inch high. The width of the inner notch is more critical because the jack has to slide into it.

You can make the vertical cuts with a hacksaw blade held in your hand. It's prudent to make the cuts a bit small and enlarge as necessary. Because the hacksaw won't go around corners, make the cross cut by using a one-sixteenth inch drill to make a series of holes across the bottom of the notches. Use the hobby knife to finish cutting out the notch and smooth the edges with the file or the knife.

Now use the hacksaw blade to increase the width of the inner wall's notch at the open end to 0.5 inch wide and 0.4 inch high so it will clear the sides of the jack. Try the jack for fit and trim the notch as necessary so the jack slides in smoothly. If you get the notch too big you can always glue the jack in place.

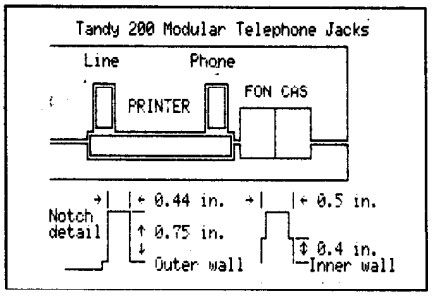

Figure 1. Use this diagram, created when you run JAXPIX.BA, *to install a standard RJ-11 phone jack in your T200.*

WIRING

Each jack has four wires, using only two leads, the red and green ones. They go to the middle two pins or wires of the jack. Cut the other leads off. If your jack uses different colored wires, make sure the ones you choose go to the middle pins of the jack. If the wires have terminals on the ends, cut them off. The wires need to be long enough to reach from the top case to the bottom case. Four inches should be enough. Strip a quarter inch of insulation from each wire and twist the red wires together because they are "common" to the circuit.

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Circle 116 on reader service card.

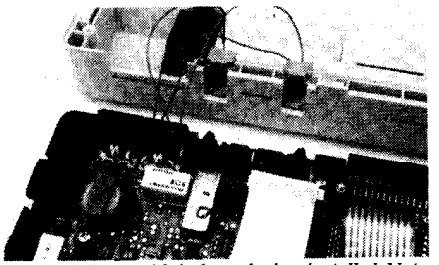
Look at the round, 8-pin DIN jack labeled *PHONE* as if it were a clock. The pins to be used include pin 1 at 3:00, pin 3 at 9:00, and pin 7 at 2:00. The pins aren't numbered, but the Tandy adapter plug's pins are numbered. You can take the plug apart and see which pins it uses, just to be sure.

Examine the inside of the DIN jack until you have figured out where the metal pins go and which ones you want. Use an ohmmeter to help if necessary. Carefully solder the pair of red wires to pin 3 at 9:00 and one green wire to each of the other pins (at 2:00 and 3:00). Solder quickly—the jack is plastic and will soften if the pins are heated for too long. Don't slop solder and cause a short.

REASSEMBLY

Slide the jacks into their slots. It doesn't matter which jack goes in which slot. The telephone line plugs into the jack that's wired to pin 7 (the 2:00 pin). Your telephone plugs into the other jack. Remember to label the jacks.

Now carefully flip the top case over and settle it on the bottom half. Be sure to slide the ribbon cable for the LCD through its slot. There's plenty of room for your new wires, but make sure they aren't pinched. As the top goes on, check that the keys, especially the function keys, aren't stuck. When everything is clear, snap the halves together. Then reverse the rest of the disassembly instructions. Be careful with the LCD cable and the cable cover so the cable doesn't get bent or pinched.



The Model 200 with jacks and wires installed. Note their placement relative to the other components.

FINISHING TOUCHES

After you replace the batteries and make sure it all works, plug a telephone line into the new *LINE* jack and try it out. Now put your old adapter in a drawer and enjoy your modification. I carry a six-foot modular cable in my Tandy's case for occasions where I find a telephone jack but no wire.

Please send any comments, questions, or suggestions to me care of *Portable 100* magazine or via the *Portable 100 Bulletin Board*. (See masthead for phone number and *TELCOM* stats.)

Tandy 102's Help Roush Racing Win!

Real-time data collection through telemetry gives auto racers the winning edge.

by Joe Stephan

MotorSports News Service Int'l. Special to Portable 100. Certain factors in life cannot be changed: The sun is going to come up, you're going to pay taxes, and people will *NEVER* run out of uses for Tandy's venerable 100/102/200 laptops!

Several years ago a Tandy customer magazine gave a look at Paul Newman's factory-backed Nissan team using a T102 to program their electronic Engine Management System (EMS). Today, the Ford-backed Roush Racing team has gone one further in using T102's to monitor sophisticated *real time* electronic telemetry as their cars speed around North America's race tracks. In fact, they make no secret that having such a system has actually won races for them.

Throughout the years the world's racing tracks have provided the absolute test for an automobile. However, while thrilling to watch, fierce on-track competition provides much more than a "Win On Sunday, Sell On Monday" marketing tool to the world's car makers. For the manufacturers, racing provides an extreme research and development level not able to be duplicated in the laboratory or on test tracks, resulting in better, safer production cars. One recent major area of that relationship is electronics.

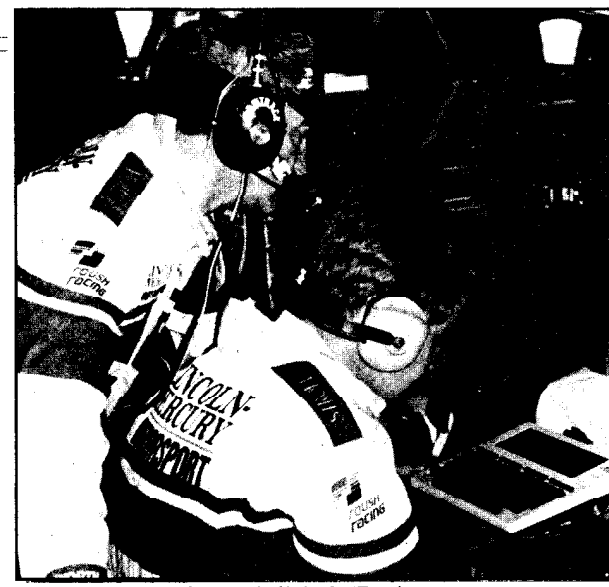
ANOTHER BRIGHT IDEA

Team owner Jack Roush is considered something of a genius. His Livonia, Michigan, shops go around the clock, in addition to racing cars in three major series, doing specialized development work for many major clients like the Ford Motor Company. With his many engine dynamometers running 24 hours a day, 7 days a week, 365 days a year, an arrangement was struck for them to generate electricity for the city.

Many of today's racing experiments become tomorrow's production components. However, one key area of Roush Racing's efforts takes a production component and improves it through racing, namely an off-the-shelf Ford EMS.

Working closely with Ford Electronics Division engineers, Ford's EEC-IV (electronic engine control, fourth generation) computerized engine control module, one of the most sophisticated in the world, is highly modified for racing.

"We removed the conformal coding, deleted some of the circuits, added or modified others, installed it on the car and let it run,"



Photos courtesy of Campbell & Co/Ford.

All new cars sold in California are now required to have one.

according to Ford Electronics design engineer Steve Heinrich.

Today's computerized EMS is completely programmable, no longer needing to be disassembled to change chips every time even the slightest programming change was needed. It's quicker, cleaner, and they are much more able to fine tune it to including getting more horsepower from the engine.

Its precisely programmed monitoring and command functions (different for each track) enable engines to operate in desired power bands, producing tremendous output while operating reliably at the limits of its structural integrity. It must control the same parameters without fail, under more extreme conditions than those to which a passenger vehicle will ever be exposed. Roush has now used three generations of EEC-IV units, which have gone on to improve the performance and durability of Ford passenger vehicle engines, like the high RPM, 24-valve Taurus SHO (super-high output) power plant.

A BETTER BRAIN

Both the production and racing EEC-IV are driven by one 15-MHz Ford 8061 microprocessor, one 32K/56K Erasable Programmable Read Only Memory (EPROM) integrated circuit, and two 2K Random Access Memory (RAM)-Universal Asynchronous Receiver/Transmitter-Input/Output integrated circuits (similar to the serial port of a typical MS-

DOS computer). They include a racing-only battery backup for nonvolatile memory.

The racing modules have been re-engineered into a compact, lightweight, more robust package, which can withstand an environment of extreme temperature—up to 125 degrees Celsius—and weather (including rain). They can also endure other extremes such as undampened vibration from up to 13,000 engine revolutions per minute (RPM), g-loads five times as high as those experienced in passenger cars, and electromagnetic interference (EMI) from an unshielded high-tension ignition system and radio transmitters.

Sensors mounted inside the engine monitor RPM, camshaft event (such as valve open, valve close, etc.), throttle plate position, intake manifold pressure, and inlet air and engine water temperature, to thousands of times each second. These sensors determine proper fuel-to-air ratio mixtures based on vacuum, atmospheric temperature and pressure, and humidity, which can vary moment to moment, let alone track to track.

They can transmit data in real time while the car races around tracks at speeds up to 200 mph

Through a speed-throttle algorithm, the EEC-IV precisely maintains the ignition timing spark advance, and the air-fuel mixture ratio and quantity electronically injected into both racing and production engines, for both power and fuel economy—critical factors in both racing and production models.

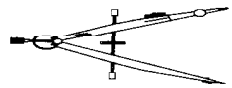
ECOLOGICAL ASSISTANCE

In production cars, a precise air-fuel ratio and spark advance must also be maintained so that emissions control systems can function correctly. Production engines equipped with an EMS run more efficiently, and hence produce less emissions. That's why all new cars sold in California are now required to have one.

Because of the especially severe operating environment of racing, Ford Electronics engineers have acquired a wealth of information in this area, particularly evaluating the durability of advanced emissions control components while developing more advanced emissions control sensors and on-board vehicle diagnostics systems (required on all new cars in California beginning with the 1992 model year).

In the racing car, diagnostic systems are combined with continuous telemetry systems, both functions generated by the EEC-IV unit.

Early attempts at this kind of information gathering required data to be downloaded after every practice, qualifying, or race session. Some of the telemetry systems which have followed and are still commonly used, transmit data once each lap, which means the competition must sort through some two minutes' worth (depending on lap time) of information every time the car passes the pits. However, with Ford's advanced system, they are able to transmit engine and vehicle data continuously in real time while the car races around tracks at speeds approaching 200 mph—elimi-



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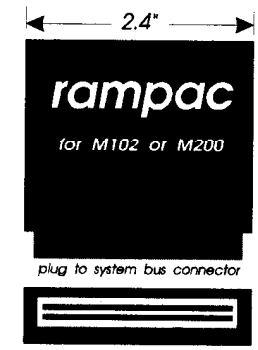

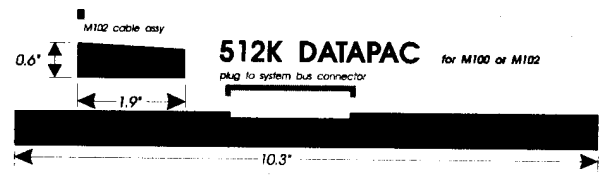

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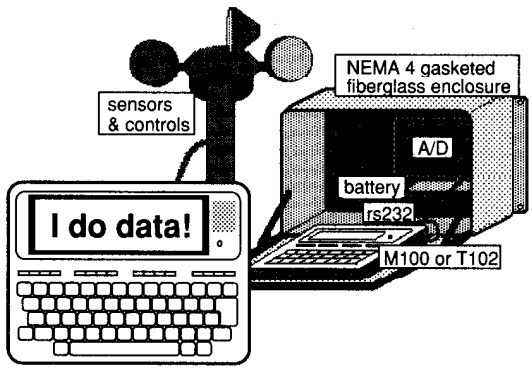

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- 5 on-off outputs, for control of motors, valves, heaters, etc., Expandable to 32 on-off outputs using optional multiplexer.
- Weatherproof case holds both the T100/102 and the analog to digital converter, etc. . Box has 2 padlock hasps. The A/D is also available without the case.
- Months of operation on battery & solar panel is possible in *powersaver* mode. The system wakes up intervals to take readings, then goes back to sleep. Continuous operation on AC power adapter & backup battery also supported.
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nating the need to sort frantically through "stale" information.

Such telemetry is especially advantageous when a car malfunctions halfway around the track during a practice session. Mechanics are ready and waiting when the car returns to the pits or garage. With prequalifying practice sessions short, and starting positions critical, it's a tremendous advantage!

THE 102'S

The data received are processed, analyzed and read out on Tandy 102 laptop computers through special software developed by Ford Electronics. Manned by both Ford Electronics and Roush Racing personnel, the T102 screens are monitored. And team manager Lee White, who is in radio contact with their drivers, is alerted if anything appears out of sync, i.e., engine getting hot, oil pressure low, oil temperature high, battery voltage getting low, and the like.

"Tandy equipment works great for us," said White, "because it's very compact, very inexpensive, and we're able to use it without the burden of taking a separate telemetry truck, or something that requires 'shore' power. These are all battery self-contained. Each car has its own Tandy 102, which, in addition to the telemetry unit, can also be plugged into and monitor (which includes downloading) the engine management systems that are in each car."

While the cars are out on the track 16 different functions about them are monitored from the pits at all time. Parameters transmitted include throttle position, engine RPM, engine coolant temperature, engine oil pressure, fuel pressure, fuel temperature, gallons of fuel used, fuel injection pulse width, battery voltage, inlet air temperature, laps, and lap times. In addition, open channels are used for miscellaneous pressures and temperatures.

These data are sent in real time from many sensors throughout the cars to the T102's via an RS-422 modem connection (to minimize EMI disruption) from the EEC-IV to a radio transmitter. A signal is sent from a small antenna on the car to an antenna erected in the pits on a 30-foot boom, and then sent to a receiver. The data then go back through another modem and into each T102. The system works perfectly, even among the tall buildings of the street races through downtown Miami and Long Beach.

A SECOND SET OF EYES

"We are like a second set of eyes," White said. "We are able to use basic information that it gives us, minute by minute, second by second, which otherwise we wouldn't have access to. Because our cars are 700-plus horsepower they're very fast, and really, the driver has his hands full just driving the car in competition. Plus, it's a rare driver who can come into the pits after a group of laps, and when you debrief him, can tell you all the information that you really need to know.

"So what we've been able to do by having the telemetry system is that we can keep *our* eyes on everything that we need to know about in terms of durability and terms of performance. Then all the driver has to do is drive the car and come in and tell us basically what's happening with the handling and gears and so on. He doesn't have to worry about remembering what the water temperature was, what sort of RPM he was pulling in a certain place, what sort of turbocharger boost pressure he had, or temperatures or pressures or anything, because we're monitoring all that, we have all that in front of us all the time. It makes us more efficient, and it lets us make better use of the driver's time."

This sophisticated system has saved them more than once, and can even be acknowledged responsible for their pulling off several wins.

"The times it's saved us is where we would see a trend, say in engine temperature maybe elevating in certain places and cooling in others. This would tell us the water level in the car is getting low, and we can do something about that before it causes catastrophic damage to

the engine. We can bring the car into the pits where we have a very simple pressurized tank; we just take the hose over, stick the nozzle on a special fitting, it shoots it full of fresh water, and the guy is on his way. Takes a matter of seconds."

Some real case examples include the 1989 Sebring, Florida, 12-hour race, where they saw on their T102 screen the transmission temperature going up in one of their Mercury Cougars. Deciding not to take a chance, before it could fail they brought the car in and changed the transmission—which they did in 19 minutes. It returned to the track for the win, heading a 1-2 Roush/Ford sweep of the tough GTO class.

In 1988, during a three-hour race at Summit Point, West Virginia, a change in the weather between practice and race day saw a different pace of the race developing than they had planned on. Their Mercury Merkur XR4Ti's were suddenly producing better gas mileage than anticipated, and with that kind of information available, their strategy was quickly changed to go the distance on only one gas and tire stop, as opposed to the two they initially planned. They won by 32 seconds, about the same time that second stop would have taken. Again, their T102-monitored telemetry system definitely won the race for them.

"Several times we've been able to salvage various situations and either finish races and get points, or win races, which, of course, help us in our championships as a result of having this equipment," White said with confidence.

That statement is best put into perspective by Roush Racing's impressive record. In the International Motor Sports Assn (IMSA) they have won the GTO class Manufacturers and Drivers titles in 1985, '86, '88, '89, and '90. In the Sports Car Club of America (SCCA) Trans-Am Series they have won the Manufacturers and Drivers titles in 1985, '86, '87, and '89. All total they've won 19 major professional road racing championships in the last five years.

Again, their T102-monitored telemetry system definitely won the race for them.

They currently lead this year's IMSA Exxon Supreme Series, despite having to build two new cars after the start of the season. For the season opening endurance races, the Daytona 24 Hours and 12 Hours of Sebring, last year's Mustangs were run with V8 engines. Being carbureted they didn't have an EMS, so they had to adapt specially prepared, production street car EEC-IV units to process data and send it out to their T102's.

ELECTRONIC HORSES

After winning their class at the Daytona 24 Hours, the biggest road race in North America, for the seventh straight year—young sensation Robby Gordon finishing fourth overall against outright prototype sports cars—they went to work on the most exotic "Intelligent Tech" Mustangs yet. Sponsored by Whistler Radar Detectors, their latest versions are powered by 700-horsepower, fuel injected, turbocharged four-cylinder Ford engines, mounted in tube frames, which carry five-speed transmissions at the rear in a transaxle arrangement, and wrapped in fiberglass look-alike bodies. This one uses the full EEC-IV EMS, which is fully monitored on the T102's.

That system being an electronic second set of eyes allows the drivers to concentrate so much on driving, for the first time the

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AUTO RACING

many usual dial gauges have been eliminated from the dashboard. In their place is a small computer screen, which electronically displays a tachometer, plus, probably more for the drivers' own peace of mind, a small thumb-activated switch on the steering wheel spoke flips the screen to six other information "gauges" (such as water temperature, oil temperature, etc.) displayed on bar graphs or digital readings, identical to what's shown on the T102.

Treating Daytona almost like its own separate season, they didn't start seriously on the new cars until after then. Under pressure to build them very quickly, they built two race cars in a little over two months—unheard of even for them. With no time for testing whatsoever, "right out of the box" the new cars finished second in their first two outings, held one week apart on opposite ends of the country. After challenging for the win in the Miami street race, they led every lap but the last two of the following week's Long Beach street race.

"We are pretty pleased with the new cars," White said proudly, "particularly since we've now gotten some testing time with them."

There's little doubt the instant success of these newest, quickly built Roush Mustangs are due to the well documented baseline they began from. That baseline came from the mounds of technical and performance data acquired, not only from actual racing, but—as competitive as racing, particularly with factory involvement, is today—teams now actually are doing more miles testing than racing (it's nothing unusual for an Indy 500 winning team to run as many as 2,500 miles of testing during the month of May). Any time Roush Racing rolls a wheel it's collected from Ford's EEC-IV EMS, real-time monitored and/or downloaded with their T102's.

Over the last five years, Roush Racing, since they started working with Ford Electronics, have to a large extent prototyped or proven Ford engine management and telemetry systems. The latter has also become used to eliminate chase vehicles on road car development trips, including into remote areas, where before engineers had either to return to their home base or try and hook up the EMS to the mainframe computer with an often unreliable telephone link.

The ultimate application of telemetry systems for the benefit of the consumer could lie in gathering data from a customer's car or truck while in use—possibly with satellites—for the purpose of forecasting potential problems or diagnosing existing ones. Engineers predict its implementation will result in fewer recalls and speedier issuing of technical service bulletins.

Another racing benefit of note is that many new, young engineers are being trained to adapt quickly to and overcome major challenges of today's volatile car market, where competitive pressures have forced the makers to shorten drastically their once six-year lead time on new models.

BUT DO THE DRIVERS GET FREE T-SHIRTS?

The EEC-IV has now found its way to other forms of racing, like Ford's desert racing truck team, and the Ford-backed Benetton (yes, the colorful clothes maker) Formula 1 team which contests the globe trotting World Championship Grand Prix tour. Sometimes Roush Racing tests and develops special pieces for Benetton before they are sent on to the Great Britain-based team (which initially used T102's but now brings a special telemetry truck to do the same thing).

That association now sees Roush taking on a new project, which may have another future return to production road-going vehicles. They are working on adapting Benetton's exotic "Active Suspension" over to their cars, currently collecting data for study and analysis of the fully computer controlled suspension system.

At this point they have separate computers in each car (not part of the telemetry system), which are collecting data from the current suspension via laser ride-height sensors which tell how the car is actually moving on its platform as it moves around the track. Infrared sensors measure tire and brake temperatures, and sensors measure road speed, steering wheel input, and lateral and longitudinal acceleration. This information is downloaded into laptops when the cars come into the pits, where they have plotters and screens to bring up all those parameters together. There they can lay them side-by-side, or one over the other, for evaluation.

Eventually they hope this program will see the actual Active Suspension and their onboard computers in their race cars, where they will be controlling certain dynamic parameters about the chassis. That might be shock absorber dampening control, roll rate with computer-controlled sway bars, traction control and anti-lock braking system, or four-wheel steering! These are several possibilities they are looking at, working side-by-side with Ford Electronics and Ford Chassis engineers, to develop the program over the next 2 to 3 years.

"Many electronic things that we have done have gone right back into production cars, or are assisting in building production cars in the case of the telemetry system we're using." In closing White said, "The new suspension system, the actuators and controllers we are going to be working on designing and building in conjunction with Ford could very well find their way into production cars five years down road."

And if they do, Tandy laptop computers will have again played a big part.

We gratefully acknowledge Kevin Kennedy at Ford's Campbell and Co. racing PR agency and Lee White at Roush Racing for their valued assistance in the preparation of this article.

Joe Stephan spends much of his time in press rooms of the nation's car and motorcycle racing tracks, where he says Tandy 100/102/200 laptops make up the bulk of computers used.

COMPATIBILITY: MS-DOS.

The Tandy 1500HD

Leader of the Pack.

by Stan Wong

Photo 1. The Tandy 1500HD leads the way for Tandy.

I have the simplest tastes. I am always satisfied with the best.
—Oscar Wilde

WARNING: Biased review. Do not read further if you hate bias and prejudice. I am biased towards computer software and hardware that works the way I do, and I am prejudiced against computer companies burdening me with heavy equipment while unduly lightening my wallet. Enough said.

What weighs about 6 pounds, snuggles nicely into your lap, and provides hours of enjoyment? No, it's not a baby but Tandy's latest entry in the DOS notebook derby: the Tandy 1500HD.

The 1500HD is the successor of the successful 1400 series. It is essentially an XT-class notebook machine packaged into a unit not much bigger than a Model 100. Back in 1982 when I bought the original 4.77 MHz IBM PC, the system filled my desktop and emptied my wallet. If you had told me then that in nine years I could get a computer for twice the processor speed, half the cost *and* include a 20-megabyte hard disk in a six-pound package, I would have had you fitted for one of those white dinner jackets. You know, the ones with the sleeves that fasten in the back.

Well, welcome back from the funny farm. At $1,999 the 1500HD is Tandy's best XT-class laptop yet. It makes few compromises. It's not the lightest or smallest laptop on the market but it provides the essential features that many users look for.

It has a 20-megabyte hard disk *and* an industry standard 1.44-megabyte floppy disk drive. Many notebooks in this class, like the Toshiba T1000XE or the Sharp PC-6220, eliminate the floppy drive and assume that you have a desktop machine to which you can transfer files through the serial port. But if the laptop is your *only* machine, then you definitely need the floppy disk.

For those of you who can't wait for the nitty-gritty, see the Product Specifications box on the next page for the 1500HD rap sheet.

NOT YOUR NORMAL REVIEWER

Computer hardware gets reviewed by a reviewer. The computer company sends the reviewer a unit to evaluate. The reviewer tries out the computer for a while and sends the machine back. The reviewer then gives his or her impressions based on some ideal standard of what a computer should be.

Well, welcome back from the funny farm.

You may have noticed that in the big PC magazines, the "editor's choice" awards usually go to the most capable (i.e., extensive, expansive, comprehensive) units. That usually means the machine also costs the most, too! Ordinary mortals like you and me can rarely afford the "Cadillac" version of everything.

This review is different. Tandy didn't send me a review unit. I bought one with my own dollars. That means the 1500HD had to meet the highest of standards: mine. Not some imaginary ideal that we'd all like to have but one that fits the way I work and my bank account.

FIRST IMPRESSIONS

The 1500HD comes packaged in an angular black case unlike its predecessors, which came housed in white cases with rounded corners. Its sleek shape calls out to those who really want to compute while on the move. My trusty WP-2 has a good looking black case also, but this one is just so "purty!"

Turning on the system, I was pleasantly surprised by the screen. It has a crisp blue-on-white appearance that is very readable.

One thing was missing: the disk noise. It is quiet. You can hear it in a quiet room, but in an office you can't hear it at all.

The CGA graphics is adequate for text-based applications. If you're heavy into graphics applications, then the CGA resolution is definitely a weak point.

The 1500HD has an 84-key keyboard that is well laid out.

The power switch is protected from accidental turn-ons. Nice. The power indicator LED is not covered in the

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closed position so you can tell if you have left the power on. Very nice.

NOT A POWER USER

The 1500HD has power management features built in to help you minimize the power drain and increase the operating time between battery charges.

A switch lets you select between full- and low-screen brightness. The 1500HD display looks outstanding at the full brightness setting and, surprisingly, still looks very good at the low brightness setting.

The 1500HD automatically powers down the hard disk drive to a standby state after a few minutes (user settable). Note that this standby mode is different from off. The drive still uses power because the drive electronics are still on. When you need to retrieve data on the hard drive, the drive automatically spins to operating speed.

The LCD automatically turns off after a user-defined time. Pressing the *ENTER* key turns it back on again.

The special *Fn* key, in combination with four of the function keys, lets you selectively turn off the disk, speaker, display, or all three with just a keystroke.

BATTERY LIFE

Battery life for the 1500HD is very good for this class of machine. This NiCd battery is a removable unit that forms part of the top-rear of the machine. It is rated at 3.5 to 4.0 hours. Although I haven't reached those numbers, here's what I did observe.

With my new machine, I noted the following: 2 hours, 40 minutes before beeps and warning lights; 2 hours, 50 minutes until shutdown. Usage was with VERY heavy hard disk access and low screen power.

After three months, I noted this: 2 hours, 5 minutes before warning beeps and lights; 2 hours, 28 minutes until shutdown. Usage was with low screen power and moderate disk activity.

I attribute the shorter battery life to the NiCd "memory effect," despite my best efforts to deep discharge the battery periodically. Buying an extra battery would be a worthwhile precaution.

I recommend that you save your work when you hear the first warning beep. Perform frequent saves of your data. This may use up the battery faster, but you may otherwise not have enough power left to spin the disk to save your file if you wait too long, even though you still have power to compute.

PRODUCT SPECIFICATIONS & SUPPLIERS

1500HD Computer — $1,999.00
- 10MHz NEC V20 processor
- 640K memory
- CGA graphics
- Backlit LCD (7.5 X 4.8 inches)
- 20 MB hard disk; 23 ms access
- 1.44 MB 3.5-inch floppy drive
- Serial port
- Parallel port
- MS-DOS 3.3 & *DeskMate* 3.0

Size: 12.2 x 10 x 1.7 inches
Weight: 6.0 pounds
AC adapter 6.5 pounds

Options include:
- 1 MB EMS memory
- 2400-baud internal modem
- Spare NiCd battery
- Carry case

Available from any Radio Shack store.

A KEY(BOARD) FEATURE

One feature of the 1500HD clinched the sale: the keyboard. Now the feel of the keyboard isn't the greatest. I've got some complaints that I'll air a little bit later. But the clincher was that the 1500HD has a switch that lets me swap the placement of the *CapsLock* and *Ctrl* key and put the *Ctrl* key next to the *A* key where God meant it to be.

The keys are laid out in a conventional way. The arrow keys form an inverted T in the lower right corner. There is no separate numeric keypad. Like the Model 100, the keypad is embedded in the normal "alpha" key area on the right side of the keyboard.

As well as its strong point, the keyboard is one of the 1500HD's weak points. Aside from the ability to switch the *CapsLock* and *Ctrl* keys, the key travel is too short. On my machine I frequently miss keystrokes because I have to hit the keys straight on. If I press the keys at an angle, or hit the edge of the keycap, the keystroke often fails to register. Since I'm a touch typist, I don't notice this until later. Thank goodness for spelling checkers!

LIGHTS & POWER

The 1500HD has the normal status lights indicating the state of the *CapsLocK, NumLK, ScrLK,* and *KeyPad* keys. An additional HD access light is included. All these are conveniently located just above the keyboard. The floppy disk activity light, unfortunately, is located on the side of the machine with the drive itself. You can't tell the status of the floppy drive without leaning over.

The power and battery status lights are located just to the right of the status lights but are actually on the outside of the case. When you close the display cover, you can readily see if you left the power on. No more dead batteries when you get to your destination. With a laptop, working on the run becomes a way of life, and this is an extremely important feature. I know, I've arrived empty-handed before with other laptops.

Also in the good category is the location of the power switch. When you flip up the display it uncovers the power switch. When you close the display, the power switch is protected from accidentally being turned on. I know. I've had other laptops get jostled and turned on inside my luggage or briefcase.

The AC adapter is a 1500HD strong point. For my previous laptop, the AC adapter was so large and heavy that I had to carry it in a separate bag. Instead of the traditional "brick" supplied by most manufacturers, Tandy has supplied a compact unit that weighs only 0.5 pounds.

OPTIONS

There are four options that you outfit the 1500HD with: 1 megabyte of EMS

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☆ **Inside the Model 100** by Carl Oppedahl "...an excellent Guide" —New York Times. A thorough guide to the Tandy Model 100. Learn about A.L. programming; disassembled ROM routines; keyboard scanning; UART, RS-232C, and modem; Clock/calendar chip; Interrupt handling; 8085 instruction set-$24.95.

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(expanded) memory, 2400-baud internal modem, spare NiCd battery, and carry case.

The 2400-baud modem is a small circuit board about 2 inches square. At $199 it's a good value for a laptop modem. I use it daily and it gives me noise-free performance. I use it to file my stories with *Portable 100* and to commune with CompuServe and GEnie.

The 1-megabyte EMS memory board plugs into a slot under a cover just above the keyboard. At $399 it's pricey but worth it for me. A lot of the software that I use can take advantage of EMS memory. I have allocated the bulk of it as a disk cache to reduce the disk access time. Since the disk automatically powers down after several minutes of inactivity, you can save the time waiting while the disk spins back up to operating speed when you need to get data. The most frequently used data is kept in the cache instead, saving your disk the trouble.

The memory conforms to the EMS (Expanded Memory Specification) 4.0 standard. I've found that it works with almost all my software that uses EMS memory. The exception is Quarterdeck's *QRAM* (version 1.0). *QRAM* lets you use EMS memory to map terminate-and-stay-resident programs and device drivers into the high memory area above 640K. To do that, though, requires that the EMS hardware support multiple page frames, which the Tandy hardware does not. The result is that I can map 64K worth of programs out of low memory, but I lose the use of the remaining EMS memory. Not a good tradeoff unless you really need the extra 64K.

SOFTWARE INCOMPATIBILITIES

I found some software incompatibilities with the 1500HD. I've noted the problems with *QRAM*. The *Norton Backup* (version 1.0) program won't work. Symantec, the Norton publisher, is aware of the problem. I also tried a copy of *Fastback*, another hard disk backup program. It had the same problem as *Norton*. Both programs attempt to speed backups by taking control of the floppy disk controller at a very low hardware level. I suspect that the 1500HD controller isn't constructed the same as desktop units, at least at a very low level. The DOS *BACKUP* utility works fine, however.

My disk caching software, *Vcache*, corrupts the hard disk. I went through three reformats before I figured out what was happening. I'm assuming this happens only with the 1500HD since *Vcache* works like a champ on my desktop 386SX.

One thing was missing: the disk noise.

CONCLUSION

The Tandy 1500HD represents a well balanced computing package. It has the right blend of features to satisfy a wide audience at a reasonable price. Other machines in its class may excel in certain categories, but the 1500HD has the best balance, making it the leader of the pack.

It excels in text-based applications.

However, its CGA resolution is definitely the 1500HD's weak spot. It's unsuitable for most graphics applications. VGA resolution for laptops is starting to be the rule rather than the exception.

The 1500HD display, hard disk, industry standard floppy disk, EMS memory option, excellent keyboard layout, and price make it a tough competitor in a crowded field. It deserves your consideration.

SOURCES

The 1500HD is available at your local Radio Shack Computer Center. Its $1,999 price is lower than other comparable models from other vendors. Those models, however, are frequently discounted, so their "street" price is on a par with the Radio Shack pricing.

If you are willing to consider mail order, you can get good deals on the 1500HD through discounters such as MaryMac and Ft. Worth Computers. MaryMac has a presence on both CompuServe and GEnie so you can shop for prices online.

Stan Wong works at a silicon chip factory. His motto is "Betcha can't eat just one!" When he's not laying poly over diffusion, he's writing for Portable 100 *magazine. He's really jazzed that we think of him as a real cool dude. We don't have the heart to tell him that we don't spell dude with an "e."*

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COMPATIBILITY: WP-2

Getting it on Paper: WP-2 Page Layout

Use WP-2 features to make your prose sparkle.

by Stan Wong

I know that I've been approaching this subject bass-ackwards. Last month I covered how to get your printer set up to print a document. This presumes that you *had* something to print. This month I'll cover how to specify your page layout to the WP-2. Page layout focuses on the regions of the page that contain your deathless prose, specifying items such as margins, headers, footers, and how many lines per page make up the printed page.

The main job of writing is saying what you want to say. Of secondary importance is making your words look nice to achieve maximum impact. There's no point in having a nice-looking document if it doesn't have anything useful to say. However, having a nice-looking package can help your words get noticed. A resumé should have content *and* good looks.

You can make adjustments in the layout of your pages by changing the setting in the WP-2's page layout menu.

You set the page layout separately for each document. You have to open a document first *before* you can change the parameters. This means that you can have different layouts for different documents. You can create a master template (with all your special settings already configured) by creating an empty document and setting the page layout parameters. Then by copying the master file and editing the copy, all the layout parameters get copied too.

NOW APPEARING ON A SCREEN NEAR YOU

To get to the page layout menu, press F2-4 (hold down the F2 key and press 4, see figure 1).

This is the first half of the page layout settings. If you press *PgDn* then you'll see figure 2.

```
Justify                : ON OFF
Auto Page Numbers      : ON OFF
Starting Page No.      :  1
Header                 : C R L N
                       :
Footer                 : C R L N
                       :
Pause between pages    : YES NO
                                 PgDn
```

Figure 1. WP-2 Page Layout Menu, first screen.

What does this all mean? It means that I get to write another "dense" column and you get to slog through a bunch of tedious prose.

Page layout focuses on the regions of the page that contain your deathless prose.

If your needs are modest, like writing quick letters, you can generally use the factory settings. But if your needs are more sophisticated, then you should become familiar with this menu.

The page layout menu controls how your prose is spread across the page. Let's start with the first item on the page layout menu.

Use the up arrow and down arrow keys to move to the option that you want to change. Use the left arrow and right arrow keys to highlight the option that you want. Then press the *ENTER* key to activate it.

```
                                 PgUp
Top margin in lines    : 4
Bottom margin in line  : 8
Left margin            : 10
Characters per line    : 65
Page length in lines   : 66
```

Figure 2. WP-2 Page Layout Menu, second screen.

PAGE LAYOUT: THE BEGINNINGS

Justify. This is the control that tells the WP-2 how to treat a line of text with respect to its alignment with the right margin. If justify is OFF, then the WP-2 fits as many words as possible on a line, up to the limits of the right margin, and then *wraps* the next word to the next line on the page. This is known as a *ragged-right margin.*

If justify is ON, then the WP-2 adds extra blanks between words so that the last letter of every last word is flush with the right margin. This is also known as a *justified margin* (or *justification*). Take a look at the text in this column. Everything lines up on the right so *Portable 100* uses justified formatting. In WP-2 parlance, justify is ON.

Auto Page Numbers. If you turn *Auto Page Numbers* ON then the WP-2 adds a page number at the bottom of each printed sheet. OFF, of course, omits any printed page numbers.

Starting Page No. By default it's set to one. If *Auto Page Numbers* is ON, then each page is sequentially numbered starting from 1. You may need to start at a different number if your document starts with special pages, say with a preprinted insert or a title page, or if your

document is so long that you've split it into more than one file.

Header. A header is information that gets printed at the top of every page, such as a document title. You have to make two selections here. On the first line you will select from one of *C R L N* meaning Center, Right, Left, or No. Selecting *C* causes the WP-2 to center the heading between the left and right margins. The *R* and *L* options right justify or left justify the header, (put the headers flush with the right or left margins). The *N* selection deletes the current header. The second line is where you type in the text for the header. Don't forget to press the *ENTER* key to finish the header.

Footer. You set up a footer exactly the same as the header except that the footer gets printed at the bottom of each page.

Pause between pages. If this option is set to *YES*, the WP-2 pauses the printer after each page. You need this if you have to hand feed sheets to your printer. Use *NO* if you have continuous-feed (such as *fanfold*) paper. If I am writing a multi-page document I typically print the drafts out on cheap, continuous paper. For my final printout, I switch to good-looking, cut-sheet paper. I change this parameter from *NO* to *YES* so I can hand feed each sheet through my printer.

PAGE LAYOUT II: THE SEQUEL

Okay, now we've taken care of the first set of page layout parameters. Press *PgDn* and you'll see the second set.

Top margin in lines. This setting controls how many blank lines will be reserved before the first line is printed. This is your top margin.

Bottom margin in lines. The bottom margin is the amount of white space to be reserved at the bottom of the page.

Left margin. This specifies how many blank characters you want at the left edge of each page.

Characters per line. This is the maximum number of printed characters allowed per printed line. Note that you have to adjust this number if you are using other than the default 10-character-per-inch font. If you are using a compressed font, then you will have to make the number for this option larger.

Page length in lines. This is the number of lines on a page. This number includes the top margin and bottom margin. The page length minus the top and bottom margins is the number of lines that will be printed per page. You can vary this if you are using specialized paper that is longer or shorter than the standard 8.5" X 11" format (66 lines).

Hewlett-Packard laser printer owners note: You have to set the page length to 60, instead of the default 66. The HP laser has unprintable regions near the borders of the paper that it can't print to, unlike dot-matrix or daisy wheel printers.

At this point, you have completed making your selections. If you press the *ENTER* key, you will be returned to your document.

It's important to note that you don't have to set the page layout until you are ready to print your document. The WP-2 formats the document for your printer as it prints it. The settings are not permanently embedded into the document. If you know in advance what you want, go ahead and enter the settings now. You can change them at any time.

WINDING DOWN

Next, I intend to cover text formatting: controlling the appearance of the printed word. Maybe I can sneak a technical word or two about the WP-2.

P.S. I just received a package from Midwest Marketing Associates. Inside is some hardware supposed to help with developing ROM-based applications! Developers, if you can't wait until I've had a chance to evaluate the unit, call them at (513)433-2511.

Also thanks to those who answered my appeal for input. Thanks for taking the time to share your thoughts with me, both of you.

Until next time, don't forget to write!

This is your column. I want you to help define the "yellow brick road" for me to follow. Fire up your WP-2 and send me a letter in care of Portable 100 *or directly at P.O. Box 28181, Santa Ana, CA 92799-8181. If you prefer the electronic medium, use GEnie address STAN.WONG, CompuServe address 70346,1267, or Internet address dasun!wongs@Sunkist.West.Sun.Com.*

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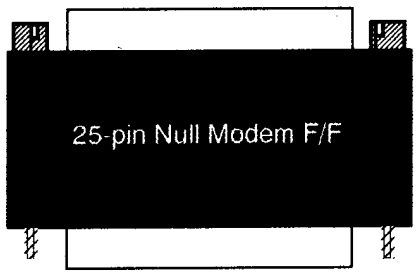

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When we designed *Disk+* we did it out of necessity. We wanted a way that we could just connect a Model 100 to our desktop computer with a cable and save files onto the desktop's disk drive. We wanted it to be so simple to use it would be self-explanatory.

Picture this. *Disk+* comes to you on a Snap-in ROM and a diskette for your desktop. You take a quarter and open the little compartment on the back of your Model 100. Then you just press the ROM into the socket. *Disk+* appears on your main menu just like a built-in.

You connect your Model 100 to your other computer using an RS232 cable (available from TMNE for only $20).

You just place the *Disk+* diskette into the desktop's drive and turn on the computer. It powers up automatically and says "awaiting command" on your desktop's screen. Then you just put the widebar cursor on the Model 100 main menu on *Disk+* and press ENTER. You are shown your RAM files arranged just like the main menu.

To save a file to your other system's disk drive, you just move the widebar cursor to the file you want to save and press ENTER. It is saved instantly with no further action.

To look at the disk directory, you just press a function key on your Model 100. You see immediately the disk directory on your Model 100 screen, and it is arranged just like your Model 100's main menu.

To load a file from the diskette to your Model 100, you just move the widebar cursor to the file and press ENTER. The file is transferred to your Model 100's RAM instantly. You can press F8 and go back to the main menu, and the file you loaded from diskette is there, ready to use.

It is so nice to be able to keep your documents, programs (both BASIC and machine code) and *Lucid* spreadsheet files on the diskette, and bring them back when you need them. All files are ready to run or use with no changes or protocol by you.

If you have access to a desktop computer and don't have *Disk+*, then evidently we have done a poor job telling you about it.

All files and programs that you load or save, go over and come back exactly as they are supposed to be because of full error checking. This guaranteed integrity is really a comfort. *Disk+* is wonderful in so many other ways. For example, you can do a "save all" of all your RAM files with just a touch of a function key. That group of files is saved on the diskette under a single filename with a .SD (for subdirectory) extension. Any time you want, you can bring back all those files at once, or just one or two if you like, again with one-button ease.

Disk+ takes up no RAM. That's zero bytes either for storing the program or for operating overhead.

What really excites most *Disk+* users is text file cross compatibility. Your Model 100's text files are usable on your desktop computer, and your desktop's text files become Model 100 text files.

This means you can write something on your Model 100, and with *Disk+* transfer it instantly to your desktop and start using it right away on your bigger computer. Or the way we like to work is to type in a document on the desktop computer and then transfer it to our Model 100 with *Disk+*. Then we print out the document, beautifully formatted, using WRITE ROM.

Disk+ works with just about every micro sold, from IBM PC and its clones, to all Radio Shack computers (yes, all), to Apple II, Kaypro, Epson and most CPM. Just ask us. More than likely, your computer is supported.

Incidentally, hundreds of Model 100 owners have gone to their Radio Shack stores and bought a color computer because it is so low priced, and with *Disk+* they have an inexpensive disk drive.

And if that weren't enough, how about this: *Disk+* also provides cross-compatibility between different computers like IBM, Apple or the Model 4 using the Model 100 as the intermediary device. Quite a feature!

The snap-in ROM is really great because you can use other ROMs like *Lucid* or WRITE ROM. They snap in and out as easily as an Atari game cartridge and you never lose your files in RAM.

Anyone who ever uses *Disk+* simply can't do without it. But so many times we have had new users call us and say, "Wow! I had no idea when I ordered it that *Disk+* would be so fantastic. I just couldn't believe that I could use my desktop computer's disk drive with my Model 100 just like it is another main menu."

That's why we sell *Disk+* on a thirty-day trial. If you aren't completely satisfied, return it within thirty days for a full refund. Priced at $149.95 on Snap-in ROM. MasterCard, Visa or COD.

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Supercharge *DeskMate* Spreadsheets with *Lotus-DM*

Switch over to a formula-1 spreadsheet made for *DeskMate*.

by George Sherman

In last month's article we took a hurried look at spreadsheets and in particular the *DeskMate* program called *Worksheet*, a simplified spreadsheet program but more than adequate for much of your number-crunching tasks.

One of the more interesting advantages of *DeskMate* is that several very popular and well-known programs have been adapted to work within the *DeskMate* environment. Among them is probably the best known spreadsheet program, *Lotus 1-2-3* by Lotus Development Corporation, Cambridge, Massachusetts.

Lotus-DM is to *Worksheet* as *Worksheet* is to the simple calculator. Some of the advantages of *Lotus* include its ability to draw line, bar and pie graphs. *Lotus* uses a simpler method of addressing cells. In addition, *Lotus* uses advanced functions known as *at functions* (written *@functions*).

This month, look over my shoulder while I construct a spreadsheet. This may give you some idea of what a spreadsheet is and how it works, and at the same time give you a review of *Lotus-DM*. If you don't understand spreadsheets, this article may help you. If you do and you can offer me any suggestions, I am always open to them. But for now, let's begin.

INSTALLING *LOTUS-DM*

You can install *LOTUS-DM* on the *DeskMate* desktop if you wish. However, I have found that for my purposes, running *LOTUS-DM* as a standalone program works better.

If you have 4 megabytes of memory and a 20- to 80-megabyte hard disk you might want to incorporate it into your overall *DeskMate* setup. But without the extra memory, you can run into problems. I never thought, after so many years with my M100, that I would hear myself saying 768K of RAM and two 720K floppies would not be enough room. There is not enough room. There I've said it.

By operating *LOTUS-DM* as a standalone program, however, I gain access to the RAM and disk memory that would be taken up by *DeskMate*.

I enter DOS and issue the command: *LOTUS-DM*. I see the usual *DeskMate* information and then the blank spreadsheet appears with a window containing information about the program, my name, and my serial number superimposed on the screen. In a few seconds this window closes and I am ready to begin.

After so many years with my M100, I find 768K of RAM and two 720K floppies not enough room.

The page looks similar to any other program tuned to the *DeskMate* environment. The top line of the screen contains a reminder of the help key—*F1*. This is followed by the current date, the title of the program (*LOTUS-DM*), and in parentheses, *(Untitled)*. When you give the spreadsheet a name, the program replaces *(Untitled)* with the spreadsheet's name. To the far right of the first line is the current time.

The second line contains information about the various pulldown menus and the function keys that activate them. From left to right they read, *File F2, Edit F3, Worksheet F4, Range F5, Graph F6, Data F7, ! F9, and X F10*. The third line begins with a block that contains the current cell address.

The next block is the *edit field* and covers over half the width of the screen. This is followed by five message blocks, which the program uses to tell the user its status. In the last of these blocks is the word *READY* to tell you the spreadsheet is awaiting your instructions.

The bottom of the screen and the very right margin of the screen contains arrows for use with a mouse. The remainder of the screen is covered by little rectangles known as cells. This is your blank page waiting for you to begin your work.

If you have used *Worksheet*, you will note several differences almost immediately. *Worksheet* makes no provisions for ranges or graphs. A *cell* is the point where columns and rows intersect. In *DeskMate*'s *Worksheet*, these cells are addressed using both letters and numbers, such as R5C2, which stands for Row 5, Column 2. This becomes cumbersome when trying to write formulae.

LOTUS-DM uses a simpler method in which it designates the columns by letters and the rows by numbers. Cell R5C2 therefore becomes B5. My cursor is waiting for me at A1, the *home* position.

One more point. As initially constructed, *LOTUS-DM* uses a default column width of 9 characters. You can change this from 1 to 240 by selecting *Worksheet, Column* (or *F4, C*) or use the

MOTOR RECORD 1991

Date	Mileage	Gasoline		Oil	Storage	Repairs	Tires	Wash	Accessori	Miscel
		Gallons	Amount	Grease	Parking					
	57,853									
04/05	58,016	10.7	$12.30							
04/15	58,222					$229.87				
04/15	58,234	12.2	$14.32					$3.00		
04/27	58,430	10.3	$12.34						$18.69	
04/29	58,696	12.4	$14.89							
"	"	"	"	"	"	"	"	"	"	"
"	"	"	"	"	"	"	"	"	"	"
	843	45.6	$53.84	$0.00	$0.00	$229.87	$0.00	$3.00	$18.69	$0.00

Average cost/gal	$1.18
Monthly Total	$305.40
Start Mileage	57,853
End Mileage	58,696
Avg. Miles per Gal	18.5
Avg. Cost per Mile	$0.36

Figure 1. You can manage your finances with Lotus-DM, *a version of* Lotus 1-2-3 *made for the* DeskMate *environment.*

quick key *CTRL-W* (hold down *CTRL* and press *W*) and typing the width you need.

SETTING UP A SPREADSHEET

What I'm setting up is a spreadsheet to keep track of my automotive expenses. First, I prefer to sit down and plan what I want to do with the spreadsheet and what information I am looking for as the result of the computations. In this regard I am helped by a little pocket record book I have used for years called *Ward's "Ever-ready" Motor Record Book.* I use it as a guide to what my spreadsheet should look like.

What I want is the monthly total of ten items, the sum of the totals, the average cost per gallon of gasoline, the average miles per gallon, and the average cost per mile to operate the vehicle.

Step one consists of setting up the basic spreadsheet, which I'm going to call *CAREXP.WKM* for "Car Expense, Worksheet Master." On the worksheet I'm going to list columns from left to right labeled, *Date, Mileage, Gasoline, Oil and Grease, Storage and Parking, Auto Repairs, Tire & Tube Expense, Cleaning and Washing, Accessories,* and *Miscellaneous.*

I want to title my worksheet page, *Motor Record 1991.* With the cursor in the home position, I begin typing this title. As I type, nothing happens on the worksheet itself, but up in the edit field (look above the worksheet) each character appears as I type. I make any corrections and then press *ENTER.*

At this point, the information I've typed appears on the spreadsheet starting at the beginning of cell A1. Note that its length exceeds 9 characters. No matter. *LOTUS-DM* just spills over into the next column. As long as I do not enter any information in cell B1, the title remains as is. On the other hand, were I to enter information in cell B1, my entry in cell A1 would be truncated to 9 characters or whatever the column width was set to.

In contrast to letters, numbers do not carry over into the adjacent column.

In contrast to letters (letter text in spreadsheet cells are called *labels*), numbers do not carry over into the adjacent column. If the column is too narrow for the digits in a number (say, a cell contains a number with 10 digits), *LOTUS-DM* replaces the figures with asterisks. The value is still there and can be used by the spreadsheet, but you cannot see it. To overcome this, use the *CTRL-W* setting to widen the column to leave room for all the digits of the number.

Using the arrow keys, I move the cell pointer down to A3 and type *Date,* then press *ENTER.* Whoops. The label is flush with the left margin and I wanted to center it. Unless told otherwise, *LOTUS-DM* assumes left flush margin for labels. If you'll look up in the edit field, note that what looks like *Date* in the worksheet appears as *'Date* above. The apostrophe is a label *prefix,* which tells *LOTUS-DM* to place the label flush with the left margin. A caret (or ^) symbol means center the label, and a quotation mark (or ") indicates flush right margin.

Since I have already pressed *ENTER,* I have to reopen the edit mode to change the label. I do this by pressing *CTRL-F2.* Now I change the apostrophe to a caret, press *ENTER,* and lo and behold my label is centered. Continuing to the right, column by column, I name column B *^Mileage,* column C *^____Gasoline,* (note I began this name with five spaces to center the title over both columns C and D, since *Gasoline* designates two ranges—gallons of gas and amount paid), column E *^Oil,* column F *'Storage,* column G *^Repairs,* column H *^Tires,* column I *^Wash,* column J *'Accessories,* and column K *^Miscel.* No, I didn't make a mistake—I deliberately skipped column D, which will become amount paid for gas.

I move the cell pointer to C4. I can accomplish this move in one of two ways. Either move the pointer cell by cell using the arrows, or use the quick jump method. I press *CTRL-F5* and the edit field divides itself into two sections. In the first is the notation *Go from* and the current cell address *K3* (where I typed my last label). In the second is the

notation *To K3*.

I type *C4*, which automatically overlays the *K3* in the second half of the edit field, and press *ENTER*. Presto—my cell pointer is positioned at cell C4. I enter *^Gallons*, move to D4 and enter *^Amount*, move to E4 and enter *^Grease*, and last to F4 and enter *^Parking*.

I have decided that the column for mileage should be a little wider. Using *CTRL-W*, I widen it to 10 spaces.

HOME ON THE RANGE

Using the *range* commands from the pulldown menu accessed by pressing *F5*, I designate each column as a range from row 5 to row 35 with appropriate titles. For example, a range in column C I can name *GAS*, which would tell *LOTUS-DM* that cells C5 through C35 are included in the *GAS* range (no pun intended). I can give similar names to the other columns. With these ranges specified, I can work with each range of cells as a unit, say, adding all the cells in a range as described below.

Next I format each column to tell *LOTUS-DM* what kind of data I'm going to enter and how it should look. For instance, I tell it to show figures in the mileage column with no decimals and a comma at the thousands mark. I format column C the same way except to include one decimal place. I format all other columns to the right to show values as U.S. currency with two decimal places.

Using *CTRL-F5* I jump the cell pointer to B36 and begin entering formulae. Formulae must begin with a math symbol such as + (otherwise, the program assumes you're typing a label). In cell B36 I enter the formula *+C44-C42*.

One of the nicest features of *LOTUS-DM* is that it includes the aforementioned @functions and thereby increases to 51 the number of such commands you can use. One of these is *@SUM*. Since I have already designated ranges and named them, I can type into cell D36 the formula *@SUM(GAS)*. This tells *LOTUS-DM* to total all the figures in the range named *GAS* and show the total on the worksheet.

I could enter each formula the same way but there is a simpler method. I press *CTRL-C* with the cell pointer still in D36. Again the edit field divides itself. In the first half is the notation *Copy D36*. In the second half is the notation *To D36*. I type in *E36..K36* (in the second half), *LOTUS-DM*'s way of designating an unnamed range. And I press *ENTER*. The formula is now copied to each location. *LOTUS-DM* automatically enters the name of each range inside the parentheses, according to the column.

I move the cursor to A38 and type, *'Average cost/gal.* In cell C38 I enter the formula *+D36/C36*. This divides the total amount paid for gasoline by the total gallons. Using the *CTRL-F* command, I format this cell to U.S. currency with 2 decimal places.

Moving now to cell A40, I type *'Monthly Total.* In cell C40 I enter the formula *@SUM(D36..K36)*, which adds up the monthly totals in row 36 (columns D through K). I format this cell also as U.S. currency, 2 decimal places. In cell A42 I type *'Start Mileage*, and in cell C42 I enter *+B5*. All this does is read the first mileage entered and show it in cell C42. Note here, on the first line of the worksheet proper, cell B5, I always enter the ending mileage from the prior month. The current monthly entries begin on the second line.

In cell A44 I type *'End Mileage.* What I want here is the last mileage entered in column B. One of the @functions available in *LOTUS-DM* is *@MAX*, finds the maximum value in a range of values. In cell C44 I enter the formula *@MAX(MILEAGE)* and VOILA! *LOTUS-DM* searches the range designated as *MILEAGE* (which is column B) and in cell C44 enters the highest figure in that range, in this case the last mileage entered. Isn't this neat?

Two more entries and I'm done. In cell A46 I type *'Avg. Miles per Gal.* In cell C46 I type *+(C44-C42)/C36*. I format this cell for one decimal place with a comma at the thousands. For my last entry I go to cell A48 and type *'Avg. Cost per Mile* and in cell C48 the formula *+C40/(C44-C42)*.

Now that my spreadsheet is done I use the *Save as* command on the *F2* pulldown menu and save the file as *CAREXP.WKM*. To use this spreadsheet each month, I pull up the master copy, and after making the first entries I save it as *CAREXP.WK#* where # is the number of the month. As an example my current worksheet is labeled *CAREXP.WK5* for May.

Let me finish by saying I also constructed a summary spreadsheet in which I enter the monthly totals at the close of each month. *LOTUS-DM* lets the user copy ranges from one spreadsheet to another either as a direct copy including formulae, as a data copy added to the information already there, or as a data copy subtracted from information already there.

Last, if you need more information on spreadsheets please contact me. If you have some constructive ideas as to how I can improve *my* use of spreadsheets please contact me.

BY GEORGE!

You can contact George on CompuServe (ID 72300,3203) or by mail, either c/o Portable 100 *or directly at 1701 Clarke Street, Ponca City, OK 74601. (Please enclose SASE if requesting a reply.)*

Unless otherwise stated, all quotations contained in this and future articles are from the following books:

Getting the Most Out of DeskMate 3. *Michael A. Banks. 1989. A Brady book. Simon & Schuster, Inc., 15 Columbus Circle, New York, NY 10023.*

The First Book of DeskMate. *Jack Nimersheim. 1990. Howard W. Sams & Company, Macmillan Computer Book Publishing Division.*

Also included as reference material is Lotus Spreadsheet for *DeskMate. 1989. Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. And* Ward's "Ever-ready" Motor Record Book. *John J. Ward. A Division of Printing Press Co., Inc., 23-08 Jackson Avenue. Long Island City, NY 11101.*

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edited by Linda M. Tiernan

No-slot Hard Disk Attaches to Printer Port

Micro Solutions has released the *Backpack* hard disk drive, a new addition to the Backpack line of no-slot peripherals. This external hard disk unit is compatible with any PC machine that has a standard parallel port, including portables. It requires DOS version 3.0 or higher.

The Backpack drive is easy to install; plug the drive into the printer port and run the automatic installation program. It requires no interface card because data transfers go through the printer port. The drive has a printer port that enables a printer or another Backpack to be attached.

Three models of the hard disk will be available using a 3.5 inch form factor: 40 MB, 80 MB, and 120 MB. Retail prices will be $650.00, $850.00, and $995.00, respectively.

Portable computer owners who have outgrown the capacity of their internal hard drives will want a Backpack for their homes or offices. Persons who work with the same programs at two different locations can carry a Backpack from one computer to another. Field service personnel can carry diagnostic software or software updates on a Backpack.

Thanks to its unique software driver, the Backpack hard drive will work on all DOS versions 3.0 and higher, and is not limited to 32 MB partitions under DOS 3.x

Initial shipments of the Backpack hard drive are expected to begin in August 1991. Backpack tape drives and Backpack diskette drives are also available. For more information, contact Micro Solutions Computer Products, 132 West Lincoln Highway, DeKalb, IL 60115 (815)756-3411. *Or circle #61 on your Reader Service Card.*

Touchbase Releases Worldport 9600 Modem

Touchbase Systems, Inc. has released the *WorldPort 9600*, a compact, battery-powered V.32 modem. The new product features: Compliance with the CCITT V.32 standard for full-duplex, 9600 bps (bits per second) data transmission with Trellis encoding and echo cancellation; Support of both synchronous and asynchronous communications; Fall-back to 4800, 2400, 1200, and 300 bps, which allows it to work with most any other modem; AT command set compatibility, auto-dial, auto-answer, auto-rate select; MNP Class 4 error correction; and standards support including CCITT V.22bis, V.22, V.23, V.21 and Bell 212A and 103.

The Worldport 9600 has a variety of features that make it suited to portable use. It is very small (4.8 by 2.75 by 1 inches) and lightweight (8 ounces). The unit is powered by a self-contained nine-volt battery and may also be powered by an external supply. It has a pair of standard telephone jacks for direct connection, and also a unique interface for acoustic coupler operation, allowing it to be used in many situations where direct connection to a phone line is not possible.

Price is $899.00. For more information, contact Touchbase Systems, Inc., 160 Laurel Avenue, Northport, NY 11768 (516)261-0423. *Or circle #62 on your Reader Service Card.*

Credit-Card-Sized Modem

Practical Peripherals has released *The Practical Pocket Modem*, a credit-card-size 2400 bps external modem in versions for PC or Macintosh use.

The PC version of the modem requires no battery or power supply. It plugs directly into a PC serial port, weighs only four ounces, measures 2.25 x 3.00 x 0.75 inches, just thick enough to house an RJ11 jack. Its features include the ability to operate at 300/1200/2400 bps, automatic adaptive equalization, automatic answer mode, Hayes 2400 Smartmodem compatibility, user-modifiable non-volatile RAM to store modem configuration, pulse or touch-tone dialing ability, full- or half-duplex operation, and the *Software Speaker* program (ATX5 command for detailed call progress information displayed on CRT).

In PC applications, the Pocket Modem is powered through the computer RS232 port and the telephone lines. No batteries or AC connections are needed. The Macintosh version, which includes cables and a communications software package, requires a separate nine-volt battery adapter. Both versions come with Software Speaker. A DB25-to-DB9 converter connector is included with both versions.

The standard PC version retails form $159.00 and the Macintosh version for $199.00. They come with a five-year warranty. For further information, contact Practical Peripherals, 31245 La Baya Drive, Westlake Village, CA 92361 (818)706-0333. *Or circle #63 on your Reader Service Card.*

No-slot Tape Drive Attaches to Printer Port

Micro Solutions has released the *Backpack* tape drive, its latest addition to the Backpack line of no-slot peripherals. This external tape drive is compatible with any PC machine that has a standard parallel printer port, including portables. It requires DOS version 3.0 or higher. The Backpack drive is easy to install; plug the drive into the printer port and run the automatic installation program. It requires no interface card because data transfers go through the printer port. The drive has a printer port to enable a printer or another Backpack to be attached. Two models of the tape drive will be available using DC 2000 cartridge tapes: 40 MB, and 80 MB. Retail prices are $695.00 and $795.00 respectively.

Corporate computer users will like the Backpack drive because one model works with all IBM-compatible hardware platforms. Backpack is shareable, reducing the cost-per-PC for tape backup. Portable users will like it because they can now have a backup device which doesn't require a slot. The 40 MB and 80 MB models will be compatible with their respective QIC 40 and QIC 80 standards. The 80 MB model will be able to read QIC 40 tapes as well. Long-length tapes will boost storage capacities to 60 MB and 120 MB. Software data compression will also be included. Typical compression ratios average two to one. The drive will transfer data at a 500 Kps rate through the parallel port, making it as fast as an internal floppy-tape drive.

Initial shipments of the Backpack tape drive are expected to begin in August. Backpack hard disk drives and Backpack diskette drives are also available. For more information, contact Micro Solutions Computer Products, 132 West Lincoln Highway, DeKalb, IL 60115 (815)756-3411. *Or circle #60 on your Reader Service Card.*

The new Tandy 2810 HD *includes a built-in hard drive, floppy drive, MS-DOS 4.01, and Deskmate.*

Tandy 2810 HD Released

Radio Shack is shipping the *Tandy 2810 HD*, a notebook-sized business computer weighing 6.7 pounds (with battery). The 2810 HD features a 16 MHz 80C286 microprocessor, VGA graphics, a 20MB/23 ms hard drive and 3.5-inch 1.44 MB floppy drive. MS-DOS 4.01 and DeskMate 3.5, as well as a TEMM memory manager, are factory-installed on the hard drive. A rechargeable, replaceable NiCd battery provides up to 3.5 hours of continuous computing power and can be quick-charged in two hours. An eight-ounce AC adapter/charger is included.

The 2810 HD's one megabyte of standard memory can be expanded to 5 MB. An optional Intel 287 XLT coprocessor can also be added.

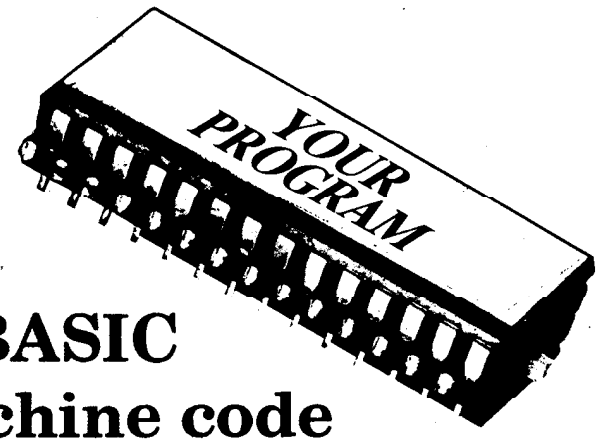
To monitor the 2810 HD's battery status, the Tandy Power View LED system is located on top of the case and is visible at all times—without lifting the display. The Power switch is located underneath the display to prevent accidental battery drain. When the 2810 HD is turned off, a Resume Mode will return the user to the exact place s/he left in an application.

The 84-key 2810 HD has a power-saving fluorescent backlit, black-on-white liquid crystal display with 640 x 480 VGA graphics resolution and 16 or 32 gray scales for improved contrast and readability. The full-size display screen measures 7.625 inches by 4.625 inches.

There are built-in ports for an external 101-key enhanced keyboard, an external VGA monitor, and other peripherals. Standard features include an internal slot for an optional 2400 bps modem ($199.95), one serial communications port and one bi-directional parallel printer port.

Price of the Tandy 2810 HD is $2,499.00. It comes with a one-year limited warranty. For more information, contact your nearest Radio Shack Computer Center or Radio Shack/Tandy Corporation, 700 One Tandy Center, Fort Worth, TX 76102 .*Or circle #64 on your Reader Service Card.*

Your own Program on a Rom



8K or 32K Your BASIC or machine code program on a custom ROM ready to snap into your Model 100 or Tandy 200.

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COMPATIBILITY: All MS-DOS computers.

One from Column One, Two from Column Two ...

Let *Power Menu* make MS-DOS as easy to use as the Model 100.

by Tony B. Anderson

Before we start today's discussion, I've added to last month's list two more names of companies that distribute shareware programs (see Listing 1).

Commercial
Selective Software
3004 Mission St.
Santa Cruz, CA 95060
(800)423-3556

Shareware
Pd Softwarehouse
312 S.E. H Street
Grants Pass, OR 97526
(800)359-1985

Listing 1. In addition to the companies listed last month, these companies also produce mail order software catalogs.

MENUING PROGRAMS

One of the keys to Model 100 simplicity is the computer's main menu system. You turn on the computer, select a program or file from the main menu by moving the wide bar cursor over the name, press the *ENTER* key, and you're into the application or file.

That simplicity is also available in your PC through selection and use of a good menuing program. Among the number of menu programs available for use in the PC, one might search your disks for *.EXE*, *.COM*, and *.BAT* program files and automatically build a menu for you, but it may suffer from lack of control over what *you* want to do.

Another includes programs that simply present a list or lists, or programs you've specified in a file somewhere. You choose and run a program by selecting its name off the listeither by typing a letter or number, or moving a cursor and pressing the *ENTER* key.

Another one shows you a *tree* of your directories and subdirectories, and "opens" any branch of the tree to see what's there. Subsequently you select and run a program from that "menu." To me, those aren't real "menu" programs; they are program lists, either created manually, automatically, or by listing the disk directory in some formalized way, which you can use to select the program or application you want to run.

DeskMate, well reviewed in great depth in George Sherman's series of articles (see p. 31), has its own menuing system. *DeskMate* is a Tandy/Radio Shack product bundled with the Tandy 1100 and 1500 and is available as an optional extra for the Tandy 1400's and other MS-DOS computers. *DeskMate* fits into the category of an *integrated software package*—that is, it contains several programs (word processing, spreadsheet, database, drawing programs, and the like) integrated to work well together and includes some built-in menu for selecting operations.

Move the cursor over the name of the program and press ENTER.

As for other integrated software packages, I'll describe some of them in future articles, But in this chapter, the concept is a standalone menu program that allows you to select and run programs of your choice or to access files in a way similar to, and as easy as, the Model 100 family.

On one hand, given the larger sizes of most PC software, it's often most useful to group a program and the files it works with on a single floppy disk if you don't have a hard disk drive. In such cases, then, a menuing program is less important—it's easy to select the program you want to run simply by inserting that program's disk into the disk drive. You have only one program choice.

On the other hand, a menu that gives you a choice of program or application is most effective with a hard disk drive. On a hard disk system, menu programs more easily handle the directories, subdirectories, and disk access for you, to take you right into the program or application you want to use, just as the main menu on the Model 100 does. Just move the cursor over the name of the program or application and press the *ENTER* key.

POWER MENU

The one I've found most useful, and settled on for my own use, is called *Power Menu* from Brown Bag Software. I've used it for three years, and *never* had a problem with it!

Although the program is available in advanced versions up to 5-point-something, I've found that the older shareware version 2.0 is the one I like best. The newer versions feature multiple password protection, which allows several users to have access to a machine but only to the programs or files that match their password. And to make that work, it asks you for the password before you get to the menu—not "simple" for a single user. In this scheme, only the programs and files available to a particular password show up on the menu.

The older version has an opening shareware notice screen, but there's a way to bypass that and get right into the menu. You can add passwords for access to individual programs or files if you

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really need that feature. Unlike the newer versions, all programs and files in the menu are shown to all users. But users can run the programs or access the files only if no password has been set, or if they know the right password, which only the primary user (a system administrator, say) can set or change.

Anyway, for single users who have full-time control over access to their machine, the password capabilities of the newer versions are probably not necessary—but they're there if you need them.

FEATURES

Power Menu is an attractive, multi-windowed menu system, which takes advantage of the PC's screen graphic capabilities. Great graphics! It looks, and is, professional in every respect.

When it comes up on the PC's screen, it has a number of boxed windows, which present the names of available programs. Each window can hold 10 names, either actual program names or names of other menu windows. The menus can be four windows deep, allowing the program to handle access to up to 10,000 names (10^4).

It's easiest to organize the menu system if you start out on the first window by describing up to 10 general purpose applications, each of which brings up its own menu. For example, in the first window you might list the applications you use in your computer by category. (See Figure 1)

Selecting a category—you can type the number of the category or first letter

```
1  Telecommunications
2  Word Processing
3  Spreadsheets
4  Accounting
5  Applications Programs
6  BASIC Programming
7
8
9  Machine Utilities
10 Park Hard Disk
```

Figure 1. A typical main menu you might create with Brown Bag Software's Power Menu.

of the name, or move the cursor over the name with the arrow keys or your mouse—and pressing the *ENTER* key brings up a second menu with additional choices. This second menu overlays the first menu in a multi-layered window effect—looks great on any system. Say for example you choose *Word Processing* on the first menu. The second menu might contain the names of the word processing-related programs you use and/or additional utility menus to hold additional programs. A typical example is shown in Figure 2.

Note that you don't have to use the program's DOS name, often cryptic or a combination of letters that don't mean much; you can use a short description of the program's function if you prefer. That often makes the menu easier to use. *Power Menu* lets you customize the windows by allowing you to choose the name or description that fits in the menu slot, as well as the drive, path, and program name to find and execute the program. And it lets you set password access and prompt for any parameter list you need to pass to the program as a command-line string.

```
1  M100 TEXT Emulator
2  Telecommuter
3  QEDIT Editor
4  Line/Word Counter
5  Spelling Checker
6  Thesaurus
7  File Splitter
8  DeTabber
9  Reformatter
10 Additional Programs
```

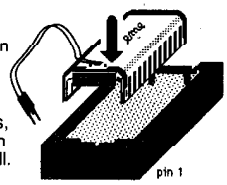
Figure 2. A typical second menu window that overlays the main menu shown in Figure 1, listing word processing programs and utilities. You create it by selecting the Word Processing *option in the main menu. Note that item 10,* Additional Programs, *can call up a third level menu of additional (word processing) programs.*

Generally, when a program ends, you want to return to the main menu. You

Advanced Memory for your 100/102/200!

extRAM is a 32K byte read/write memory expansion that fits into your Tandy's internal option ROM socket.

extRAM fits into the option ROM socket in the 100/102/200. A quick 2-pin plug connects extRAM to battery and WR lines, all under the snap-on cover. Easy to install.



There are two ways to use extRAM:
(It's one or the other at any one time.)

As a ***RAM-file-bank***, you double your space for .DO, .BA and .CO files. You store reports, data and programs you aren't currently working on out of the way in the extRAM and call them back instantly when you need them. Our improved file-bank software hides in the extRAM itself, so it uses minimal RAM and it is "cold boot" proof too. It also now includes extensions to BASIC for reading and transferring individual text files. Adapted from original software, *SLX* and *EXTBAS*, © 1989 by Paul Globman.

As a ***ROM-file-bank***, or ***emulator***, you can load extRAM with the kind of software that normally resides on option ROM chips. But no more physical chip swapping! You swap in new ROM *images* on command, from files stored on disk or RS232. Great for users of more than one ROM and for ROM developers. Loads 32K image in 40 seconds. Works with most ROM software. Software R2D2X © 1990 by Wilson Van Alst.

The software comes with each extRAM in the form of listings and instructions in a 38+ page manual. Optionally, to save typing, you can order a disk with all the programs in machine-readable form.

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____ extRAM for M100	$75ea	_____
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____ extRAM for T200	$75ea	_____
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MOVING UP

can set a parameter in the options to do that, or optionally, you can have the program leave you at the DOS prompt if you prefer.

Further, by calling a *.BAT* batch file, you can run a whole series of programs, or perform a whole series of operations before returning to the menu program. For example, you could call your text editor to type a list of names. On exit, it can automatically call the sort routine to sort the file; then it can print the list and return to the main menu while the printer chugs merrily along, *offline*, while you do something else.

```
ROOT
   ├─ ACCTING
   │     ├─ FINANC
   │     ├─ BOOKS
   │     │     └─ LEDGER
   │     └─ SPREADSH
   │           ├─ CUSTFIL
   │           ├─ PERSFIL
   │           └─ 1992PROJ
   ├─ APPLIC
   │     ├─ ELECTR
   │     └─ DRAW
   ├─ BASIC
   ├─ TELCOM
   └─ WORDPROC
         ├─ CRDFIL
         ├─ MAILLIST
         ├─ SPELLER
         └─ UTILS
```

Figure 3. A typical hard disk tree *directory, common in many PC disk utility programs. It shows the root directory and subdirectory branches as a list, linked by lines to show the directory structure.* ACCTING, APPLIC, BASIC, TELCOM, *and* WORDPROC *are subdirectories of the* ROOT *directory.* FINANC, BOOKS, *and* SPREADSH *are subdirectories of the* ACCTING *directory, etc.*

OTHER OPTIONS

Power Menu has other options such as color menus if you use it on a PC with a CGA color monitor. But note that I'll ship it configured for black and white, monocolor (green or amber), and LCD screens. Once you get the program, you can choose—with a color-select menu—screen background colors or texture, how the program highlights various lines, what the selecting-bar cursor looks like, and other features of the program's display.

A built-in help file is just a function-key press away. A utility menu explores system information and configuration, the RAM allocation map, printer status, and lots of settable options. A treelike disk manager shows your disk directory tree (most handy with hard drives), opens branches of the tree to look for, identify, or mark and delete old files, and many other disk-based operations. For an illustration of a tree directory, see the example in Figure 3.

If you're using *Power Menu* on a PC with a CRT (cathode ray tube) screen, it has a screen saver function that turns off the screen display after a couple of minutes of no keyboard input yet remains on standby. A keypress brings back the display. This feature is designed to prevent CRT *burn-in*, a common problem with early CRT screens, where the electrons would actually burn the phosphors on the inside of the screen, leaving a dark copy of the original image long after the program has gone on to other things, or the computer has been turned off. That's less of a problem today with color monitors, and especially with the LCD screens in most laptops.

Power Menu, overall, is a heck of a program for the money! It's shareware, and registering it costs only twenty-nine bucks. The version I am distributing is a "starter version" with some of the application names already installed, similar to those given in the figures. You can change it or further customize it to suit your own needs. It will be optimized for use with LCD screens—the Tandy laptops—and again, you can change that to suit your own setup. The operating manual is included on the disk. Additionally, I'll include a basic instruction file telling you how to change several options, how to change the menu names, and how to put your own programs' names in the menu windows.

I think you'll like *Power Menu*. I do!

SHAREWARE DISK

This month's shareware offering is *Power Menu 2.0*, from Brown Bag Software. It's available on a 5.25-inch or 3.5-inch disk (specify which you want) for $6.00 (includes postage) from Tony Anderson, Box 60925, Reno, NV 89506. The program files are unpacked and ready to install . Run them from the distribution disk to see what they look like, then install them in your hard disk's root directory. Add *MENU* as the last entry in your *AUTOEXEC. BAT* file so that the program runs automatically when you turn the computer on.

Tony Anderson, a sysop on CompuServe's Model 100 Forum for six years, has been a frequent contributor of articles and programs to the Forum's libraries, and also develops and sells commercial software for the Model 100 family, including the popular CRDFIL *database. He'll be happy to answer questions sent to him via CompuServe's MAIL facility (send to 76703,4062), or by postal mail at P.O. Box 60925, Reno, NV 89506 (please include SASE if requesting a reply).*

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First, LUCID© is memory conserving. It will let you build a large spreadsheet – 255 row by 126 column capacity. You build huge spreadsheets in your Model 100's RAM that could consume 80 to 100K on a desktop computer.

Secondly, LUCID© is fast. LUCID© is so rapid, a 36 column corporate financial statement took less than 4 seconds to calculate.

Thirdly, LUCID© has features you won't find in most other spreadsheets. For example, when you type a label (text) it will cross column boundaries; in other words when you type a label or title it will appear as you type it irrespective of column or width. LUCID© also allows you to set column widths individually, and of course LUCID© has insert row and insert columns, as well as other standard features. LUCID© even lets your formulas refer to cells in other spreadsheet files.

Further, LUCID© has what no other spreadsheet has: Cut, Copy, and Paste. It uses the same keys as Cut and Paste in TEXT, but here's the difference: it takes all the formulas with it when you paste and they all automatically recalculate with the entire sheet.

And here is what is really amazing. You can copy or cut from one spreadsheet and paste into another spreadsheet or even a TEXT file.

LUCID©supports all BASIC math functions as well as Log, sine, cosine, tangent, exponentiation and other sophisticated math functions.

LUCID© has so many features that you will say "this is what I need in a spreadsheet", such as automatic prompting of an incorrectly typed-in formula showing just where the mistake was made.

LUCID© has expanded "go to" functions that remember and produce a windowing capability.

But perhaps most remarkable is that LUCID© is not only a spreadsheet but a program generator as well. First, LUCID© lets you protect all cells against entry or change, and then unprotect just the cells you want for someone else to use as input fields.

LUCID© will not only process values, but text input as well so that the facts other than numbers can be responded to. LUCID© has the ability for you to refer in a formula to cells containing words. This feature combines with the capacity of doing "if then" statements that work by doing table lookups against even massive X/Y charts of text or numerical information. You can produce a program that responds to inputs with no programming knowledge whatsoever.

You can prepare a report section in your spreadsheet with instructions to your user for printout, and they can produce a personalized printout that responds to their input. All your formulas and tables that did the calculations and provided the facts are invisible to that user. LUCID© is useful for doctors for patient questionnaires, troubleshooting technicians, purchase clerks, people doing job quotes, stores for customer workups, insurance agents and anybody who needs to process specific facts and numbers to produce a report based on those responses.

LUCID© comes with a manual that explains not only the characteristics of LUCID©, but will train you how to use a spreadsheet even if you have never seen one before. You are shown how to do budgets, forecasts, breakeven analysis amortizations and many other types of personal and business reports and calculations.

User friendly is such an over-used term in this industry, but a typical comment has been "I have never seen a spreadsheet that does so much, and yet LUCID© is so much easier and faster to use."

LUCID© is a result of a most exhaustive developmental effort in which PCSG's objective was to develop a spreadsheet that was better than the state-of-the-art. We are so pleased because LUCID© provides for the Model 100 spreadsheet capability you cannot equal on a desktop computer.

LUCID© is, in our opinion and that of those who have examined it, a breakthrough. We sell it on a 30 day trial. If you are not completely satisfied, return it within 30 days for a full refund. Priced at $99. on snap-in ROM. MasterCard, Visa or COD.

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COMPATIBILITY: Model 100, 102, 200, NEC 8201/8300, Kyocera KC-85, Olivetti M10.

Transferring *TEXT* files to your PC or Mac

Getting started with your Model T computer.

by Gene Wilburn

Sometimes I have difficulty deciding whether my Model T's are peripherals to my desktop computers or if it's the other way around. Most of my writing time seems to be spent with the Model T's and most of my editing and finishing time is spent on my PC or Mac. One thing is certain: When you regularly feed files to your desktop systems, you do a lot of transfers or "uploads."

As I mentioned last month, Model T's produce plain-vanilla ASCII files, which transfer easily and well to Macs and PC's. This month I'm going to discuss how to do the transfers.

"BEAM ME UP, SCOTTY"

Captain Kirk had it made. Any time he wanted back aboard the Enterprise he'd have Scotty beam him up via teleportation technology. We don't have this for our files yet (although infrared networks are getting eerily close), so you're going beam them up the traditional way: through copper wire.

There's one essential item you must have for your Model T—a null-modem cable, or transfer cable, if you prefer. A null-modem cable should be as indispensable a part of your gear as a spare tire is for your automobile.

You've got your choice on this one. You can build it or buy it. I never build anything if I can help it, so know that you're not alone if the sight of solder and exposed wire makes you break out in a cold sweat. It's *okay* to buy, honest.

Whichever route you take, you've got to get it right. You simply can't transfer files unless your null-modem cable works. If you're a buyer, you can get the stuff you need from Radio Shack, or you can purchase one of the outstanding cables made by Club 100 (recommended). If you're a Mac owner, simply purchase a Macintosh serial printer cable (an ImageWriter cable) and you've got a perfect null-modem cable for use with a Model T.

If you're a PC owner, you have to determine whether your PC has a 9-pin or 25-pin serial port and either purchase a cable to fit, or purchase an additional 9-to-25-pin adapter. If you already have an external modem attached to your PC or Mac, you can use your existing modem cable if you attach a Radio Shack null-modem adapter to it when you do file transfers.

One end of your null-modem cabling sequence must be a 25-pin male connector that you can attach to the RS-232C port of your Model T. There's a "gotcha" here. The cases of the Model T's were designed with such close molding around the RS-232 port that some perfectly good null-modem cables and adapters won't fit. If you have one of these, you may also need to purchase a short 25-pin male-to-female cable extender.

Yeah, it's a bit of a hassle getting it set up, but you only have to do it once. Then the magic can begin.

"ONE RINGY-DINGY, TWO RINGY-DINGY"

Well, almost. Your Mac or PC also has to have a communications program before you can do any transfers. Fortunately there are excellent shareware programs for both, so you can try them out to see which one you like before sending in the modest registration fee.

For your Model T and your PC or Mac to be able to transfer files, they have to be set up the same way. That is, the communications program settings on your desktop computer must match the communications settings on your Model T.

These settings, or protocols, are not difficult to adjust. You're not even required to know their meaning as long as you enter them correctly on both sides.

TELCOM

On the Model T, you've already got all the communications software you need for file transfers. It's the program called *TELCOM* (for telecommunications), and it's the one most new users avoid.

Let's break the ice.

You invoke *TELCOM* like any other Model T program—by placing the cursor over the name and pressing *ENTER*. Go ahead. Give it a try.

TELCOM starts up by displaying some numbers and letters on the first line and leaving you at the *Telcom:* prompt on the next line. On the bottom line, five function keys are mapped out: *Find, Call, Stat, Term,* and *Menu*. We're only going to be concerned with the last three.

The *Stat* (status) function allows you to examine or adjust the communication settings. That's what the numbers are on the top line: the current status as you start up the program.

To simplify things, I'm only going to show one way of transferring files from the Model T to the desktop. I leave exploring the variations to you.

MODEL T SETTINGS

If you have a Model 100, the status line will read something like "37E1E,10 pps" or "M7E1E,10 pps" or something similar. The Model 200 is slightly more elaborate—e.g., "37E1ENN,O,10 pps."

For desktop transfers you're going to set the status to better suit your needs.

Set the status by pressing the *Stat* function key (F3 on Tandy units). When you get the *Stat* prompt—e.g., *Telcom: Stat*—type the following on a Model 100: *88N1E* On a Model 200 type: *88N1ENN,O*

The first *8* sets the speed of the transfer—in this case, 9600 bps (bits per second, often referred to as the baud rate). The next *8* represents the number of data bits, instructing *TELCOM* to send out 8-

bit characters. The *N* following the 8's sets the parity to none. The *1* instructs *TELCOM* to send one stop bit after the character. The *E* enables Xon/Xoff flow control.

As I said, you don't have to understand any of this, although it makes an interesting study if you feel so inclined. All you have to do is enter it correctly.

THE DESKTOP SIDE

On the PC, I'll use *Procomm Plus* as my example. When the *Procomm* screen comes up, you need to adjust the communications settings to match those of the Model T.

In *Procomm* you adjust the settings from the menu that pops up when you press *ALT-P*. Following the same pattern you used on the Model T, make sure that the PC is set to a 9600 baud rate, 8 data bits, parity none, and 1 stop bit. You need to know which PC serial port your null-modem cable is connected to. Most of us have our cable on COM1 or COM2.

There's one additional thing you have to do for Model T to PC transfers. You have to instruct the PC program to add linefeeds to each line as the file is being captured. In *Procomm Plus*, you do this by going to the *ALT-S* setup menu and selecting *PROTOCOL OPTIONS*. Under this you select *ASCII PROTOCOL OPTIONS*. In this menu you select *CR translation (download)* and press the space bar until *ADD LF* appears in the window.

Other PC programs have this equivalent, but I don't know their exact location so you'll have to dig this one out from your manual.

The reason for the "add linefeed" setting is that when the Model T sends a file through *TELCOM*, it strips any linefeeds from line endings, sending only carriage returns. DOS needs both a carriage return and a linefeed at each line ending—what is known as the CR/LF pair. You'll let your DOS communications program supply the linefeeds as the file is being transferred.

On the Mac I'll use *Zterm* as my example. This inexpensive shareware program, available from clubs and BBS's, does a great job with file transfers.

In your *Zterm* folder, double click on the *Zterm* program. Then pull down the *Settings* menu and set *Data Rate* to 9600, *Bits* to 8 data, 1 stop, and *Flow Control* to *Xon-Xoff Receive*. Under the *Global Settings* option, select the correct port for your null-modem cable (*Modem Port* or *Printer Port*) and be sure that *Capture Text by Line* is not activated.

Macintoshes do not use a CR/LF pair, so the Model T files are fine just the way they are received.

AND AWAY WE GO!

Okay, assuming you're still with me, your null-modem cable is connected, and your communications programs are running and set correctly, it's time to do a test.

On the Model T, press the function key that says *Term* (*F4* on Tandy units) to enter terminal mode. Notice that the bottom line of the screen changes, showing *Prev, Down, Up, Full,* and *Bye* as function key labels. If your Model T says *Half* instead of *Full*, press that function key and it will toggle to *Full*.

Now comes the test. Simply type on some keys on your Model T and watch the screen of your desktop unit. You should see the characters you're typing appear there. If you don't, something is wrong. Your null-modem cable may be incorrectly wired, you may have selected the wrong port on your PC or Mac, or your settings may not match.

If you see characters appearing correctly, next type a few characters on the keyboard of your desktop. The characters you type should appear on your Model T's screen.

If characters display both ways, you've got a good link. Remember your settings or make them permanent, and mark your cable so it doesn't get mixed up with other cables in your collection. Once you've got a communications setup established, you rarely have to change it.

UPLOAD

Now comes the fun—actually transferring a file to your desktop unit. To do this, you have to prepare the desktop unit to capture your Model T file on disk or it will simply scroll by on the screen. Interesting to watch, but not much long-term satisfaction.

In *Procomm*, press the *Page Down* (*PgDn*) key to activate a file capture. From the listed download protocols select *ASCII*. You will be prompted for a file name—the name you want the file known by on the PC.

In *Zterm*, activate the capture function by pulling down the *File* menu and clicking on *Start Capture*. You will be prompted for a *Receive File* name.

On your Model T press the *Up* key (*F3* on Tandy units). You will receive a prompt that asks *File to Upload?* Enter the file name of the text file you want to transfer, with or without the *.DO* extension.

When you supply the name of the file, *TELCOM* responds with a *Width:* prompt. Simply press *ENTER*. This will beam your file across paragraph by paragraph—the ideal way to send a word processing file.

The fun part is watching your file display across the screen of your desktop unit. When the display stops, the file is transferred.

To end the capture in *Procomm*, press *ESC*. In *Zterm*, click on *Stop Capture* in the File menu. On the Model T, press the *Bye* key (*F8* on the Tandy units). Answer the prompt *Disconnect?* with a *Y* and you will be returned to the *TELCOM* menu. If your Model T hangs up and doesn't give you the *Disconnect?* prompt, press *SHIFT-BREAK*.

PAT YOURSELF ON THE BACK

Congratulations! You've just completed a successful file transfer. The great news is that once you've got your setup tested, all subsequent transfers are a piece of cake.

Continued on page 44.

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1985

January: DG has the One to Go, *Model 100 Proves Itself in the Jungles of Nicaragua*, Meet the Dulmont Magnum, *Telecommuter: Software that's Ingenious, Kyocera's Three Aces. End Telephone Tag with M100's.*

February: NEC Wishing upon its Starlet, In-Depth Reviews of HP 110, Sharp PC-5000, *Chattanooga Systems AutoPen, AutoPad, Trip.*

March: Reviews of Epson Geneva and Osborne 3, Comparisons of Two Thermal Printers (Brother HR-5 and Printex TH-160); *The Pluses and Minuses of Batteries, M100 Data Acquisition.*

April: Reviews of Sord IS-11. Sharp PC-1350, *DISK+, T-BASE*, and Roadrunner; *Free Software: Textpro*, Technology Transfer Damming the PICO Pipeline to Russia.

May: Review of DG1, Which Spreadsheet Should you Buy? Servicing Picos, LCD Screens in Color, Federal Express.

June: Reviews of *Tandy 200, 2.2 Companion,* and *T-Backup, M100 File Transfer*; Wrangler improves the Odds with Sharp PC-5000s, Dow Jones News/Retrieval On-line Database, *Courtroom M100's.*

August: Reviews of Datavue 25 and *Touchbase Modem*; QuickTrip Convenience Stores More Efficient, Tracing Tribal Roots and Translating the Bible in Jungles of Papua New Guinea.

September: Reviews of HP Portable Plus, *WriteROM, ThinWrite 80 Portable Printer*; A Flat Mac, *M100 Meets Challenges at Woods Hole Oceanographic Institute.*

October: Reviews of Kaypro 2000, *T-View 80*; Computerized Fire Department, Stretching the limits of Telephone and Computer, *BASIC translation Tactics.*

November: Reviews of Bondwell 2, NEC 8027A Printer, CQ Haste; *PICO Formatter*, Search and Rescue Via Computers, Industry Views from an HP Exec.

December: Close Look at Ericsson Portable and *TMPC (time management software)*, Travel Tips, Tricks for Traveling, *Dialer Program, Project management with the M100.*

1986

January: Reviews of Gridcase 2, Access, WordFinder, and Prospecting, CP/M and MS-DOS, *Security Program*, Can Universities Cope with Picos? News from Comdex, *Jazz up your LCD.*

February: Reviews of ZP-150, and LeScript Word Processing; *Stevie Wonder Inspires Stardom in M100*, Can Universities Meet Expectations of Computer-literate Students? *Cold-Start recovery, Personalized Form Letters.*

March: Reviews of Panasonic Exec.Partner, Lync 5.0, and *Hardwire*; University Rethinks its Tasks, Picos in Medicine, *Auxiliary Battery Packs Spell Independence, More Muscle for the M100.*

May: Reviews of Toshiba T1100, IBM PC Convertible, Casion FX-7000G Calculator, SG-10 Printer; *MIKEY, Appointment Manager*, and *FAST*, IRS Crowns Zenith';s Z-171, Handhelds in Restaurants.

June: Reviews of Zenith Z-171, *LapCoder, SuperROM, LAPDOS, and BlackJack*; Go Shopping at PC in Rochester, NY, OM10 RAM Map (pt 1), A Tale of Two City Councils.

July: Reviews of Bondwell, ROM2, Letterjet HS-80, and Sidestar,; Electronic Cottage, Taking Stock of Investment databases II, NEC 8201A's LCD, OM10 RAM Map (pt 2)..

August: NH's Governor discusses Laptops, PC-7000 from Sharp, Choosing your test-oriented Database manager, *Model 100/200's Lend a hand to Job Seekers*, NEC-8201A's Communication Connection.

October: Reviews of Toshiba 1100+, New Word, *Diconix Printers*, Fortune 500 Picos, Interview with DG Exec's, Desktop publishing with Picos.

November: Picos in Libraries, *Clever M100 Combinations, Exploring TPDD Part I*, Reviews of Datacomputer 2.0, *TPDD, TS-DOS.*

December: Pcios on Wall Street, Connecting to On-line Databases, Telephone Problems, *TPDD Part II*, Reviews of *Cleuseau, French/German Tutor 3, Pocketsize Modems*; 1986 Article Index.

1987

January: Book Publishing With a Pico, *Framework in a Pico*, Review of Right-Writer, JK Lasser's Money Manager, HP+Enhanced, Electric Webster, *Disk Power*, Pico's Computer Buyer Guide.

February: *Poor Man's Idea Processor*, Macintosh-Pico Connection, *M100 Cursor key alteration*, Handhelds: HP-18C, Langenscheidt 8000, TI-74, Reviews of Sord IS11-C, *Lets Play Monopoly, $100 letter quality printer.*

April: Browsing the Boards, Writers & Portables, KTI products, Badminton & NEC, Reviews of *Inside the M100, TTXPress Printer, PCSG Business Analyst*, Datapad 84 Zoomracks & ECFS.

May: Doctors with Portables, *Text to printer*, Hitting the Boar[OUT] of PC Convertible Add-ons, Holiday [OUT] & Shout, *M100 memory Expansion.*

June: Lawyers & Laptops, *Personal Management System, M100./Mainframe Terminal Prog.*, Reviews of Wang Portable, *Search, Sprint and Supercalculator, Best of Compuserve book*, Chess-to-go.

July: Programming in the Portable Environment, Sysop intervierw, Talking portables (pt1), Portable Computer Buyer Guide, Reviews of *TS-Random*, Software Carosel, Popcorn & the Hyperion.

August: NEC 8201 tokens, Laptops in Movie filming, Talking Por[OUT] Reviews of Casio FX-8000G, Tandy T400 LT, and *System 100.*

September: *English Teachers use Laptops, Picos in Class, D[OUT]mplates, Picos in the Oil Patch*, Reviews of ColorPro, and the *Sportster 1200 modem.*

November: *Control That Printer, Academia & Laptops*, Laptops on Capital Hill, Starlet Secrets, Reviews of Psion II, *DVORAK keyboard*, & Spark.

December: Global Laptopping, Starlet Software, Toronto Blue Jays & GRiD, *NiCd Notes*, Review of IMC LCD-286, 1987 Article Index.

1988

January: Portable Computer Cellular Communication, Laptop Roundtable, Pico Portable Guide. Reviews Telemagic, Direc-Tree Plus, SchwabLine, Quotrek.

February: TenniStat, Flexibility of Form, T200 and T16. Reviews Eclipse, T1100 Hard Drive.

May: Handhelds Fight Crime, A Pico in China, Compaq Port. III, Datavue Snap, Fax hits the Road, HP Portable Vectra, T1400LT, Three Pocket Modems, Close-Up's Customer & Support.

June: Multispeed in the Tropics, *Monitoring Alkaline Batteries*, PSION and Mass Storage, Datavue Spark, Smith Corona Portable Word Processor.

July: Toshiba on the Road, *Diskette Ratings, Metered NiCd Manager*, Procomm on the NEC, WordPerfect 4.2 on the T1000, Sales Ally.

September: Laptops & the Learning Disabled, WordPerfect 5.0, Dynamac EL, HP-71B, WordPerfect Executive, Webster's New World Writer II.

October: Portables at Sea, Macintosh Navigating, Piloting and Celestial Progs, NEC-8300, Compaq Port. 386, File Transfer, Golden Parachute.

November: European EMAIL, New Tricks for your Casette Recorder, Pico Pillows, Amstrad PPC-640, Selecting the President, Sales Power, Sales Strategy, Office Writer goes Light.

December: *FASTECH*, Automating Your Sales Force, AI, ScriptWriter, LiteDrive, Homeword Plus, VP-Expert.

The Portable 100 Classifieds

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FAST (tm) 3x turbo cassette LOAD/SAVE utility for Tandy M100/102, M200 (specify). See 11/89 P100 review. SASE for information. Cassette, manual $19.95 ppd. Zwillenberg, 475 Richmond, Maplewood, NJ 07040.

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Data Acquisition with M100/102. REI, RR1 Box 113F, Royalton, VT 05068. (802)763-8367. 10/91

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MODEL T JOYRIDE

Continued from page 41.

How do you get your file into your DOS or Mac word processor? That depends on your word processor of course. DOS *Word, WordStar,* and *WordPerfect* need to know only the name of your file and the directory it is in to retrieve it.

The same is generally true for Macintosh word processors. With *MacWrite,* simply *Open* the captured file and click on the *Paragraph* option. *WordPerfect/Mac* asks you to identify the original file format when you *Open* the file. Select *Text. WriteNow* also requires you to click on *Text* in the *Type of document to open* window. *Word* simply imports the file with no questions asked.

There you have it. There's more technical stuff here than I usually deal with and communications programs take a little getting used to. But the rewards are immediate and highly gratifying. It takes only a few repetitions of the process until you begin to wonder why you ever felt intimidated by *TELCOM.*

Next month, I'll look at *TELCOM* again: how to use an internal or external modem to connect to a remote computer system.

You can communicate with Gene via CompuServe (his ID is 72435,732), through regular mail via Portable 100 *magazine or directly: 91 Inglewood Drive, Mississauga, Ontario, Canada L5G 1X9. Please add sufficient postage if you mail to Canada.*

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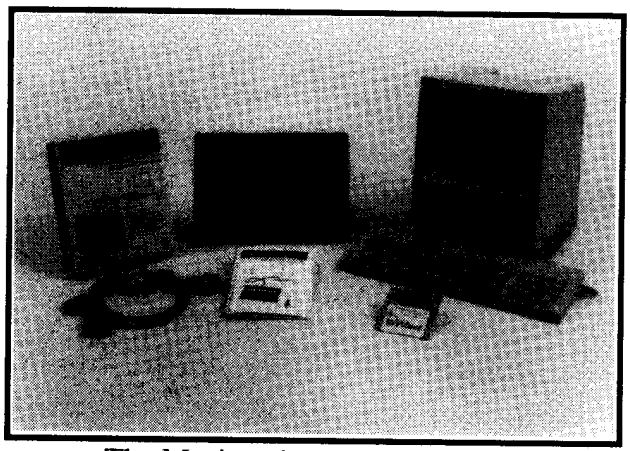
WPduet™ is the Macintosh connection to the Tandy WP-2 Portable Word Processor. With WPduet, you can transfer your files from the WP-2 to the Macintosh and convert your documents into a variety of file formats such as plain text, MacWrite II, and Rich Text Format for use with Microsoft Word, Microsoft Works, WriteNow 2.2, and others. Text files on the Macintosh can be transferred to the WP-2 for on-the-road editing.

WPduet comes with everything you need to use the WP-2 with your Macintosh: a high quality molded cable, file transfer and conversion software, and complete documentation.

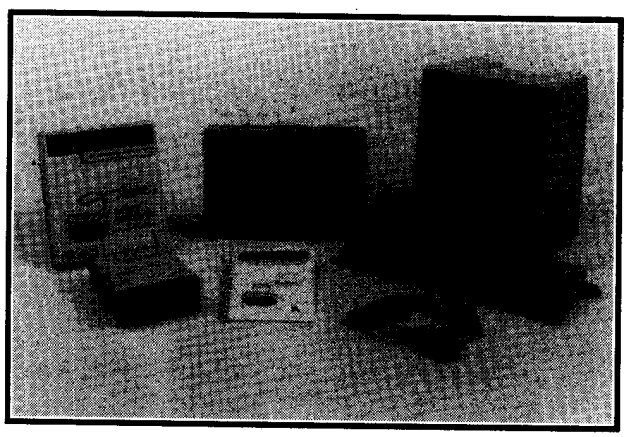
"*This* is the portable kit for the rest of us."
MacUser Magazine, December 1990



The Macintosh connection to the Tandy WP-2 Portable Word Processor

"[WPduet] does what it does, smartly and simply."
Macworld Magazine, February1991

100duet



The Macintosh connection to the Tandy Model 100/102 Personal Computer†

100duet™ is the Macintosh connection to the Tandy Model 100 and Model 102 Portable Personal Computers. 100duet's built-in file conversion facilities can convert your ".DO" documents into a variety of file formats such as plain text, MacWrite II, and Rich Text Format for use with Microsoft Word, Microsoft Works, WriteNow 2.2, and others. Text files on the Macintosh can be converted to ".DO" format and transferred to the portable computer for on-the-road editing.

100duet is perfect for backing up your portable computer. All file types: ".DO", ".BA", and even ".CO" files can be transferred with 100duet. 100duet comes with everything you need to use your portable computer with your Macintosh: a high quality molded cable, file transfer and conversion software, and complete documentation.

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As an additional bonus, WPduet and 100duet also include the Tandy Portable Disk Drive adaptor so you can connect the optional Tandy Portable Disk Drive directly to the Macintosh for easy bulk file transfers.

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† Model 200 owners can use 100duet, too. A separate program called "The Loader" is required. The Loader is available from Club 100: A Model 100 User's Group.

Circle 99 on reader service card.

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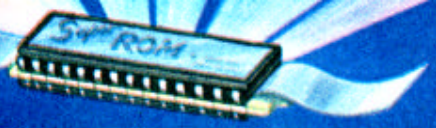

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100 all on one ROM. 32K of power without using any RAM for program storage. This is the PCSG Snap-In ROM that just presses easily into the little ROM socket in the compartment on the back. You access the four right from the main menu like built-ins.

Write ROM — the definitive word processor for the Model 100. Function key formatting or dot commands. Search and replace. Library feature — inserts words, phrases or whole documents into text from just a code. MAP lets you see a picture of your document. In all there are 60 features and functions. No one can claim faster operation. FORM lets you create interactive forms with on-screen prompts that you can answer from the keyboard. Nothing else for the Model 100 compares with the features of Write ROM. Exactly the same as the Write ROM sold as a single program. Infoworld says it "makes the Model 100 a viable writing unit ... sur-

quality and clarity.

Lucid Spreadsheet: This is the one PICO magazine says "blows Multiplan right out of the socket" and Infoworld performance rated as "excellent" and said "makes the Model 100 compute." Gives you features you cannot get with Lotus 123. Lets you build spreadsheets in your Model 100 that would consume 140-150K on a desktop. Program generating capability with no programming knowledge required. Variable column widths. Includes find and sort with function key control. It's fast, recalculates like lightning. No feature has been taken from the original, only new ones added.

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