TANDY LAPTOP COMPUTING JUNE 1991 -VOL. 8, NO.4

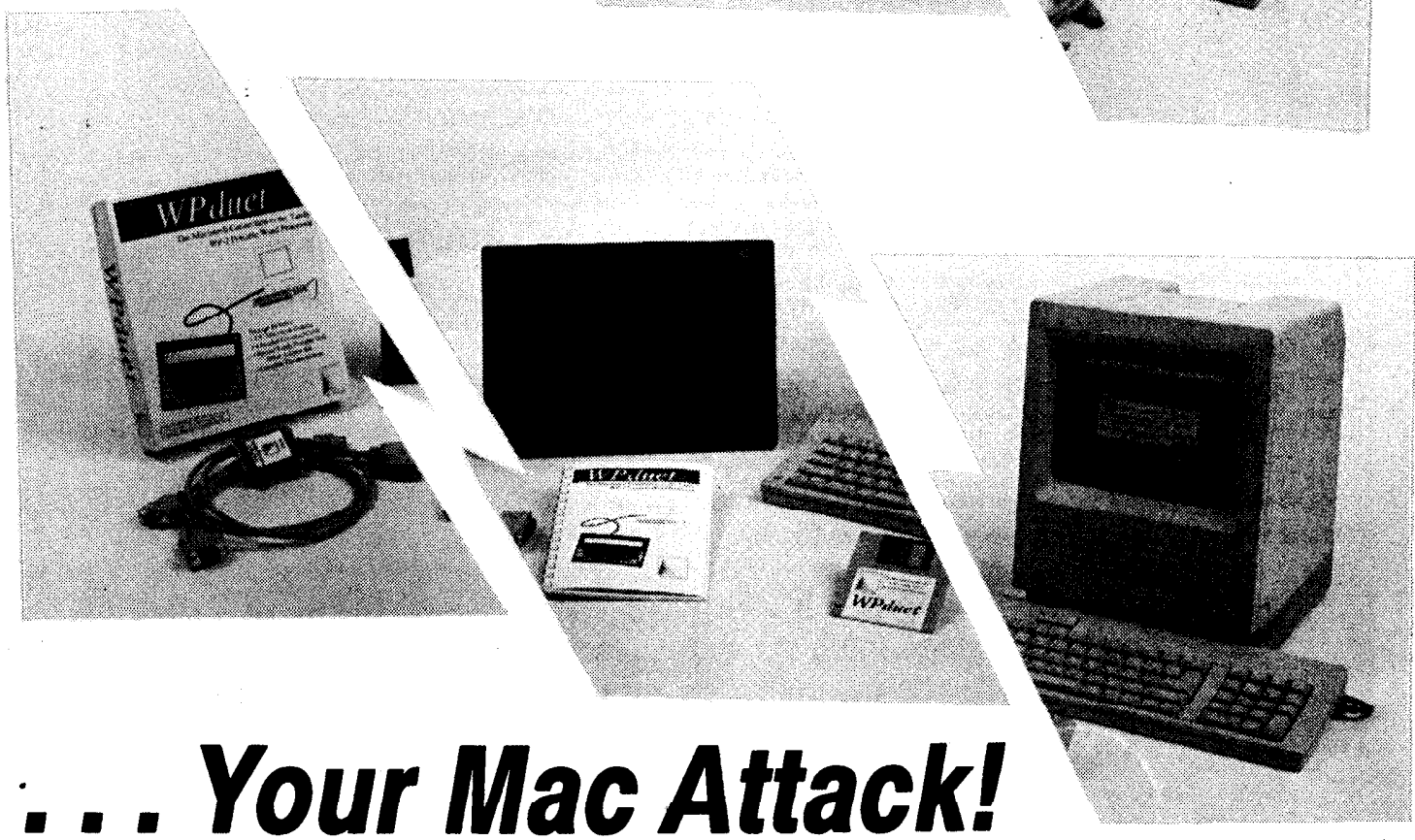
TERRY KEPNER'S

portable 100

$3.95/CAN $4.95

A MONTHLY PUBLICATION (EXCEPT COMBINED JULY/AUGUST ISSUE)

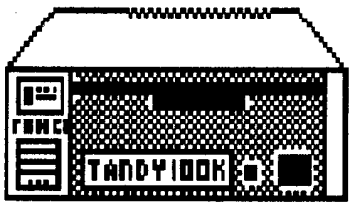
Satisfy . . .



. . . Your Mac Attack!

Laptop and Palmtop Computer Specials

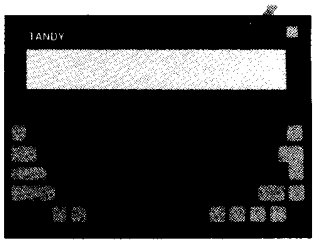
TANDY 100/102/KC-85 OWNERS: **TANDY 100K PORTABLE 3.5" DISK DRIVE SPECIAL** (Reconditioned units only)
Units come complete with manual, cable, Tandy utility disk and are fully guaranteed by Ultrasoft Innovations for 90 days.



PACKAGE #1: TDD-1 + DISKPOWER + SUPERA = $159.95 (Reg. $269.95)
PACKAGE #2: TDD-1 + DISKPOWER + TEXTPOWER = $159.95 (Reg. $249.95)
PACKAGE #3: TDD-1 + DISKPOWER + ULTRASCREEN = $159.95 (Reg. $229.95)
PACKAGE #4: TDD-1 + DISKPOWER + ASSEMBLER = $159.95 (Reg. $229.95)
PACKAGE #5: TDD-1 + DISKPOWER + DISASSEMBLER = $159.95 (Reg. $229.95)
EXTRAS: 3.5" DISKS (Quantity 10) = $8.95 / AC POWER ADAPTER = $6.95
UPS GROUND SHIPPING & HANDLING IS EXTRA = $6.00

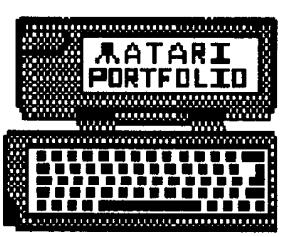
The Tandy WP-2 Word Processor Special (New units only)

Package#1: WP-2 + 128K Memory Chip* Bundle . . . $ 399.95 (Reg. $ 430.00)
Package#2: WP-2 + WPDUET (MAC) Bundle . . . . . $ 419.95 (Reg. $ 450.00)
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.



PACKAGE #1: PORTFOLIO + 032K MEMORY CARD + PARALLEL INTERFACE = $349.99 (Reg. $480.00)
PACKAGE #2: PORTFOLIO + 064K MEMORY CARD + PARALLEL INTERFACE = $399.99 (Reg. $530.00)
PACKAGE #3: PORTFOLIO + 128K MEMORY CARD + PARALLEL INTERFACE = $449.99 (Reg. $600.00)
PACKAGE #4: PORTFOLIO + 128K MEMORY CARD + SERIAL INTERFACE = $479.99 (Reg. $630.00)
PACKAGE #5: PORTFOLIO + 128K MEMORY CARD + PC RAM CARD DRIVE = $499.99 (Reg. $650.00)
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.

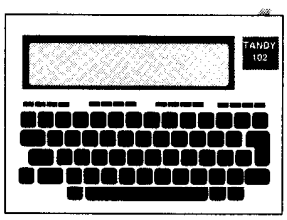
The UltraCard Special for the Tandy 100/102

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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Circle 135 on reader service card.

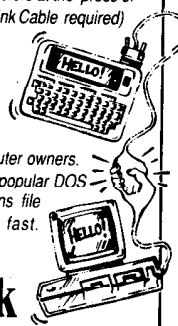
More Than Just a Laptop User Group

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

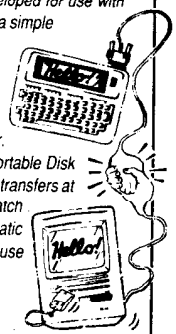


Turn your WP2 into a PC-partner. The only "file transfer" and "file conversion" software available or WP2 to DOS computer owners. Online utilities convert WP2 .DO files to popular DOS word processing file formats ... maintains file formatting codes. Super easy and fast. (Computer<—>Link Cable required)

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).

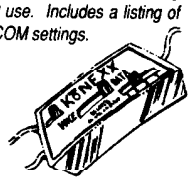
Keyboard Bands

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

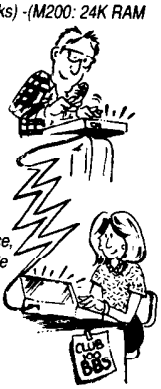


The hottest, new line-attachment for going online though office PBX and hotel phones. Does not require a dedicated line. Active electronics provide much more than simple switching. Attaches, in-line, between the phone handset and the base. Includes clips for hard-wired base-to-handset found in most hotels.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

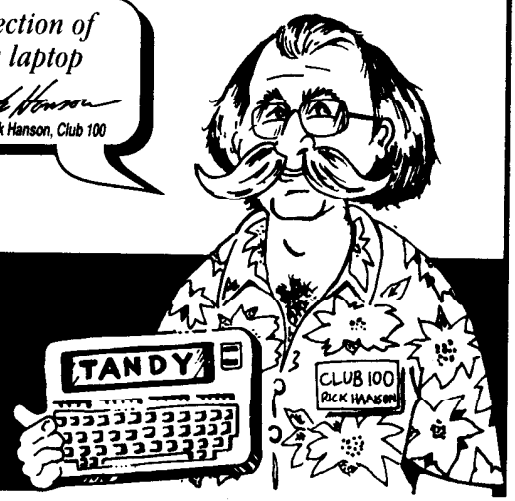
Program Collections

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:
Cabochon's WPduet and 100duet make these laptop computers into portable Macintosh word processors!

VOL. 8, NO. 4
June 1991

DEPARTMENTS

ROM WITH A VIEW

Hey, we did it! Remember how I was drooling last month for the coveted Eight More Pages? Well, you're holding 'em right now! This is the largest *Portable 100* assembled since I signed on as technical editor exactly three years ago. Thanks to loyal support from you and our advertisers, massive efforts by our lunatic staff and authors, my amazingly brilliant, suit-like management tactics (tee hee!), and even some decent luck for a change, I'm having a terrific third anniversary! THANK YOU ALL!

So we've reached our goal. Now what? Go for another eight pages, naturally. And another eight. And ... well, you know how suits think, right? Meanwhile, let's figure out the best way to use the new pages we've got.

As always, this will be a "group participation" thing—we'd like your input. That flood of mail I asked for (and got) a while back has been very helpful. Please keep your letters coming. And while you're firing up *TEXT* and connecting the printer for this next go-round, let me share my ideas ...

As our cover says, *P100* has always been about Tandy laptops. For years, this meant Model 100's 102's, 200's, 600's, and other Kyocera clones. When Tandy introduced the 1100/1400/1500/2800/2810 laptops, we needed to add MS-DOS coverage as well. With so few pages, MS-DOS articles took space away from Model T pieces, and vice versa. It was tough. Real tough.

With enough pages now to provide decent coverage of each computer family, my basic plan is to have advertising for each pay for its respective editorial space. That is, DOS ads buy DOS pages, and Model T ads buy Model T pages.

This particular issue is a bit "heavy" with Model T articles, because despite an abundant stock of good Model T stuff, we're somewhat short of appropriate MS-DOS material. By "appropriate" I mean "particularly pertinent to *Tandy* MS-DOS laptops." While other PC publications review the latest hardware and software, too often those reviews aren't conducted on Tandy laptops. Thus, they can be misleading. We sometimes find that what works fine on a Toshiba runs like absolute dog barf on your Tandy. When other publications called the 1400 FD/HD basically a slimmed-down 1400 LT, they neglected to tell you (or probably even to find out) that plugging your LT power supply into an FD/HD machine might result in smoke!

And that's where *Portable 100* has always excelled. We cannot (nor would we even care to) compete head-to-head with other magazines. Our strength is the important Tandy-specific information they ignore. That's not to say, however, that we'll cover only Tandy-specific topics. Helping you get the most from your Tandy laptop means telling you about products that *are* covered elsewhere. We just try to sort it all out and bring you the best balance of coverage.

That's where you come in. I want another Mail Flood telling me what you want to see in our MS-DOS coverage. Be specific. Rather than simply saying you want more software reviews, tell me what kind. Accounting? (Business or personal?) Sales and contact management? Games? Desktop publishing? Full-featured word processors or the just "lite" ones? Want hardware reviews? Of what? Accessories? Mice? Joysticks? Want tutorials? On what? Telecommunications? What about it—which software, or how to do it in general? Techie or hand-holding? Do you want some construction projects? Again, be as specific as you can.

While you're at it, tell us how you already use your MS-DOS laptop—and how you'd like to use it. Model T owners often tell us, but we don't get much similar input from MS-DOS owners. That'll help us choose our directions.

Continued on page 44.

Toolbox

Manuscripts were typed into Microsoft Word 3.0 on a Tandy 1400 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.

TERRY KEPNER'S
portable 100

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POSTMASTER: Send address changes to: Portable 100, Portable Computing International Corporation, 145 Grove Street Ext., PO Box 428, Peterborough, NH 03458-0428.

Go! Go! Go!

Hurray for Nuge! Go! Go! Go! I am so enthused about the new magazine and publisher that I am renewing my subscription for TWO more years. If I can help, you have but to ask.

I recently bought the extRAM modules directly from EME and like it very much. I do note that the price indicated in the *Portable 100* ad is about fifteen-percent higher than I paid directly.

I also ordered a Backpack 1.2 from Central Computer Products, but have not received it yet. Once again, the price from Central was $50 less than that indicated in the magazine. I seriously doubt that the readers will pay a fifteen-percent premium to buy through *Portable 100*.

My best wishes for your success as a business "suit" and my best to the Elf-promoter.

Nathaniel F. Ireland
Marlow, NH

We referred your pricing comments to Micro Sense, and here's what they had to say:

"I'd like to respond to the letter Nathaniel wrote you regarding the pricing of Micro Solutions' Backpack External Floppy Drive.

"We carry the Backpack External for the same price as Central Computer Products (the 3.5" 2.88 MB unit for $369, other sizes for $299). As with any new product, prices vary and become competitive as the newness wears on. Our company has been doing business with Micro Solutions for about four years and find their products to be superior in quality, packaged with excellent documentation, a one year warranty and superb technical support, if you need it.

"We look forward to carrying many new products, Tandy compatible, and will let you know as soon as they become available."

Marcia Jones
Micro Sense.

Nathaniel, Many companies have a policy of matching any advertised price, so if you see a product elsewhere for less, you can probably get it from one of our advertisers for the same price. The advantage to buying here is that our advertisers support Portable 100, *and we support you! Buying from someone else will only deprive you of a source of long term support.*

-TK

ROAD WARRIOR, X-TEL, & X-BANK

I'm glad to receive the December issue, looking forward to your next issue. I would like to do a review of Sigea's *X-TEL* if it allows *TEXT/TELCOM* switching. Are you interested? Is the Cambridge Z88 the same as the Tandy WP-2, i.e., does it suffer from the same telecommunications problem?

Regarding the Road Warrior accessory kit review, etc., where was the advertisement for it? Do you have additional details on digital packet as it affects *TELCOM* and the Worldport modems?

I would like to see a basic level review of the Model 200 memory structure, how it works, and how to run *X-Bank* and Traveling Software's ROM with Speller.

Does Rick Hanson have a calendar and expense report program for the Model 200 that's better than the Tandy *Multi-Solutions*? I hope so, so I can use *Ultimate ROM II*.

James Seago
Wilmington, DE

We already have a review of Sigea's X-TEL *in hand (thanks for offering!) and hope to publish it soon. The Cambridge Z-88 is NOT the same as the WP-2. It is a totally different machine, from concept all the way to hardware. Its built-in software includes a word processor, spreadsheet,* BASIC, *and telecommunications. It does not have either a spelling checker or a thesaurus. It does not have the telecommunications bug found in some WP-2's. Given a choice between the two, I think the WP-2 is the better choice if you are interested only in writing.*

We are trying to talk CP+—they make the Roadwarrior*—into advertising with us, but they seem to think our market is too small for them.*

As to using the Ultimate ROM II *with Paul Globman's* X-Bank *system, we've turned that problem over to him.*

I don't know for sure what programs Club 100 has available, but their computer bulletin board has hundreds of programs submitted by hundreds of people. It's possible that you could find what you are looking for there. Check their advertisement for information on accessing their BBS with your computer.

-TK

James, digital packet radio doesn't use a "normal" modem as such, but rather a device called a terminal node controller (TNC), which formats data into "packets," converts those to audio tones (usually via its own built-in modem), and passes them to the transmitter, where they're broadcast. On receive, the TNC reverses the process, decoding packets back into data and passing it to the computer.

The smallest available TNC, the HK-21 from Heathkit, is about the size of a deck of cards—perfect for portable operation. You can see me using mine with my Model 100 on the cover of the December '90 issue of 73 Amateur Radio Today *magazine. Back issues of 73 contain lots of good info on packet radio. To learn more, I suggest you give them a call at (603)525-4201, or write to them at WGE, Forest Road, Hancock, NH 03449. Tell 'em Nuge sent you.*

-MN

HERE'S TO SUCCESS

Here's to success in your ongoing service for portable computerists! And many thanks for working to keep on providing a forum for exchange of information and ideas, news, and advertisements on products.

As a three-year subscriber (and continuing), I'm sorry that major advertisers have backed away, but I hope they return. Meanwhile, hats off to the independent suppliers and innovators.

I'm an 8-year user of an M100 system, now expanded to about a $5,000 investment with dual eight-bank Model 100's, a three-bank Model 200, plus assorted peripherals from Tandy, Traveling Software, and elsewhere. I've sent three kids through college and earned my bread with this system in daily newspaper reporting via remote telecom from a walkabout Model 100, plus the other Model 100 coupled with a Disk/Video Interface as a home base and print unit.

In my humble opinion, my enhanced Model 100 system is more efficient, quicker, and simpler to use than others, including higher priced units. I get very defensive of these babies when anyone verbally downgrades them.

At the moment, I'm hung up in a quest for a Model 200 memory expansion unit that can be left plugged in without making the unit unwieldy for storage. I'm also looking for a method of transfer to my wife's Apple.

I've had a lot of fun with the GEnie hookup, although a few of the downloaded programs had operating glitches that left lockups requiring coldstarts.

Sorry that GEnie no longer features laptops in its monthly mailings.

I'll admit some of your material is beyond me, but I know there are many more advanced readers than I. Now I'm trying to have a little fun with the system, although my real day of relaxation hasn't arrived.

Sam Folsom
Milford, CT

The only source I know of for external memory expansion on the Tandy 200 is Node Systems (see their ad in this issue). Have you talked with them yet?

Apple file transfers are a cinch. Simply plug the two computers together with a null modem cable, and run a communications program on the Apple. After matching the parameters on the two machines, the hardest chore is getting the Apple program to NOT treat the Model 100/200 as a modem by starting to dial. You have to get the Apple program into "local" mode. Once you do this, you can zip files back and forth with ease. You might need to do a POKE 63066,1 *in* BASIC *in the Model 100 so that it will upload a linefeed with every carriage return, but usually you can get the Apple program to automatically add these as the carriage returns come into the program from the Model 100. (If you do use the* POKE, *to restore normal operation use* POKE 63066,0.)

-TK

CLUB 100 SPEAKS UP!

Finding Model 100's: It's my own fault for not keeping you more informed, thus you failed to mention our service. Folks may post FREE classified ads on our BBS regarding buying and selling Model 100, 102, 200, WP-2 computers and accessories. We have three categories: Computers, Accessories, and Wanted. Our on-liners have moved several thousand dollars worth of equipment via this service. It's completely FREE, as is the general use of our BBS. Further, folks do not have to come online to post ads. Simply send or fax their ad to me and I'll post it for them.

Mike Daigle's hit the spot with "Dear Ed" (IDEA BOX, March '91). I'm not referring to the *DeskMate* comment, but rather to the presentation of *Info Select* by Micro Logic. Guess what? Club 100 uses *Info Select*, exclusively, to track our very large membership list. We even purchased a dedicated computer just for that purpose. It's fantastic!

I.S. allows us to annotate each member's "card" in the CLUB100 stack as fully as needed to follow individual purchases, comments, suggestions, you name it. There is one point however, regarding *I.S.*'s operations that MUST be made very clear. *Info Select* is a RAM-intensive program. All data in the current stack must fit in memory. This is not a problem for most tasks, because one can have many different stacks (files). It becomes significant when one tracks the level of data that we do. I must also mention that their support technician, Rich, is very helpful. He's also very busy.

"*TEXT* ... Plus!" by James Yi (March '91), is an outstanding article. Well written, as is expected from James Yi. We at Club 100 have long noted his talent and applaud his many wonderful additions to the Model 100 line. Frankly, I think *TEXT+* is an excellent example of his work.

By the way, all the features he built into *TEXT+* have been available on Tom Bennett's *ROM2/Cleuseau* chip. The *ROM2/Cleuseau* ROM is far more than *TEXT* enhancement, though. It's also the very best collection of programming tools available for Model 100, 102, 200, and NEC 8201A programmers. *ROM2/Cleuseau* is two ROM's in one. *ROM2* is an 8085 macro assembler, debugger that all the professionals use, while *Cleuseau* adds valuable tools and features to *BASIC* and *TEXT*. I recall Tom Bennett attending one of our meetings back in 1985 where he presented this ROM. We were instrumental in helping Tom reorganize his documentation. Tom subsequently sold the selling rights for his chip to Traveling Software, who sold it for $99.95. Those rights were passed on to Club 100 in 1990. We are selling the chip for only $49.95 + $3 shipping (state your computer model when ordering).

Rich Hanson
Club 100: A Model 100 User Group
Pleasant Hill, CA

***P100* IN THE NEWS!**

Thanks very much for the special deal on the back issues, I've been devouring them from issue one, and I struck pay dirt with an early issue that documents all the *CALL*'s for the Tandy 200.

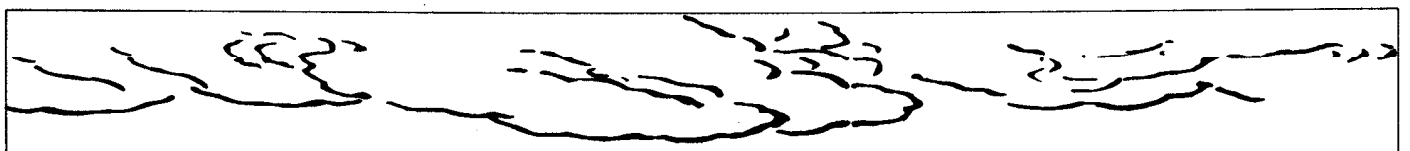
I e-mailed the article to CompuServe magazine last night; I think the editor will like it. I quoted a lot of forum members (including Mike Nugent), so I think the M100SIG folks will like it, too.

I spoke of your magazine's role in originally sponsoring the M100 forum, and I quoted you several times as a Model 100 expert. The article will appear in August, I believe.

R. Andrew Rathbone
San Diego, CA

Glad we could help you!

-TK



The Portable Office II

(Part I: Hardware—The Heart of the Matter)

Hello again. My four or five faithful readers will know from previous columns that I've recently parked my Model T and started dragging Farfel, my trusty Tandy 1100 FD, around in its place.

As I explained in a previous column, the reason for this is that, as my freelance work writing ad copy grows, the 1100 FD is able to accommodate that work with better tools and without file transfer complications. In other words, it's just faster and easier. Simplicity. It's why I used the Model T in the past, and it's why I'm using Farfel now.

One thing that hasn't changed for me is the goal of traveling as light as possible. Toward that end, I humbly present for your consideration: *The Portable Office II.*

THE BAG: I carry the system in a Eagle Creek bag that I bought from REI Co-op for around $40.00. This gray Cordura bag is oriented vertically—tall and narrow, rather than low and wide like a traditional briefcase. Farfel fits in the main compartment perfectly, standing on end. An outer pocket holds an 8.5 x 11-inch notebook and a Pee-Chee type folder. The surface of that outer pocket has several smaller pockets that hold a couple of pens, a small scratch pad, and a spell checker/thesaurus, which I will describe below.

A large outer flap folds over the whole bag. This flap has a zippered pouch where I keep my power supply and my pocket modem. The bag has a rugged handle at the top, which lets me carry it like a suitcase. Best of all, a hidden compartment opens to unleash a pair of comfortably padded shoulder straps, which lets me wear the bag like a backpack—perfect for those days that I take the motorcycle instead of the car.

THE DICTIONARY: I carry with me at all times the Franklin Word Master electronic dictionary. This small device (4 x 6 inches, half an inch thick) is powered by AAA batteries and has a QWERTY keyboard. It's a handheld spelling checker and thesaurus; it also provides me with dictionary definitions of thousands of words. It even plays several built-in word games like Anagrams and Hangman, as well as other diversions like dice roll (Yahtzee or Craps, anyone?) and Lotto or Keno number generation. It sells for around $70.00 and is worth every penny as far as I'm concerned. Games aside, this clever contraption is a godsend for a writer. I'd feel as naked without this as I would without my Bart Simpson underwear.

This clever contraption is a godsend for a writer.

THE MODEM: I use the "pocket" sized 2400-baud modem from Practical Peripherals, which I bought on sale at Egghead Software for about $120.00. This is a remarkable little device, only 3 inches long by 2 inches wide by about 1 inch thick. It weighs next to nothing and doesn't even require batteries—it's powered by the phone line itself! This has been a solid performer for me, and I can recommend it to you without reservation.

THE SOFTWARE: Ahh, here we come down to the crux of the matter. If the hardware is the heart of the Portable Office II, the software is the soul. I've spent a lot of time and effort learning which software enhances the 1100 FD and which software merely bogs the system down.

I find that my friends who use portable machines often claim that they could not use a portable without a hard drive. It's times like this that I feel fortunate to have spent so much time with the Model T. Most of these other guys came to their portables straight from a desktop and just can't imagine life without a hard drive, which is a shame.

Not that I have anything against hard drives per se. Hey, some of my best friends have hard drives. It's just that a hard drive works against many of the goals of a portable. It adds weight, complexity and cost to the computer, and it drains the batteries faster than the same machine without a hard drive.

So I'm of the opinion that, at this stage in the state of the art of portable computers, you're better off if you can find a way to get along without a hard drive. I've been able to do just that by using a combination of specific software and some hard-learned laptop strategies.

Next month, we'll take a look at both.

And now for something completely different.

HELLO? IS THIS THING ON?

Many moons ago, I asked readers for input on designing the "Model 300," our composite wish list for what we'd like to see in the next generation Model T. I was flooded with responses.

Not long ago, I asked for readers to send in nontechnical tips for using their

Portable 100 BACK ISSUES

With over 60 issues, and hundreds of articles, *Portable 100* is THE source for information, programs, and applications for your Tandy Portable Computer. But how do you find what you need among all those issues? The answer is the **updated *Portable 100 Article Index.*** Covering every issue from September 1983 to the combined summer 1989 issue, the index is designed to make it simple for you to find what you need. And at a cost of only $9.00 (postage and handling included), you should buy one today! If you have last year's index, don't despair. Update your index by adding our special 1988-1989 Update Index. It's a bargain at just $4 (P&H included).

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February									
March			OUT						
April		OUT				OUT			
May		OUT				OUT			
June		OUT						Not Published	
July		OUT		OUT		combined July/Aug. issue	combined July/Aug. & Sept. (Summer 1989)		Not Published yet!
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Model T's in everyday life. After several weeks, I've heard from a grand total of three readers.

OK for you, gang; there will be NO tips column. BAD readers! BAD readers!

This feature is invaluable for using those programs that you just can't see that well on an LCD screen.

RANDOM AXES

In the axes-to-grind department, I'd like to offer the following: I wish that Tandy and anyone else who makes LCD laptops would put a switch on their machines that allows you to reverse the display. I know it can be done: most of the Toshibas can do it. This feature is invaluable for using those programs that you just can't see that well on an LCD screen (including most games). It can't cost that much to add this feature. How about it, Tandy?

BATTERIES IN MY BELFRY

One of the best features about the Model T's is that they take regular, easily found alkaline batteries. You never have to worry about being stuck with a brain-dead computer if there's a Seven-Eleven nearby. Why can't we have the same thing on our DOS-box laptops?

I'm not suggesting that we do away with the rechargeable packs that laptops sport now. But wouldn't it be possible to design the machines with a port that would let you plug in a holder that held, say, six or eight D cells? Just for emergencies?

Oh well, enough blithering for the moment. If you'd care to do any blithering of your own in my direction, you can reach me at, for regular mail, 2125 North Farragut, Portland, OR 97217, and on CompuServe, 76166,3303 GEnie: DAIGLE.

Next month: The Portable Office Part II—Software and Strategies.

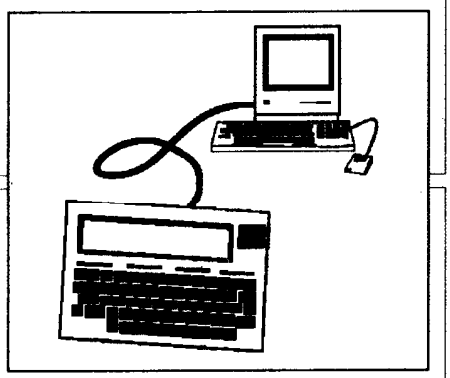
by Michael Daigle

COMPATIBILITY: Model 100, 102, 200, and Macintosh (T200—see editor's note).

Model T Meets the Mac:
A review of Cabochon's *100duet*

Select Macintosh fonts and font attributes on your Tandy 100, 102, or 200!

by Gene Wilburn



The Macintosh environment, lovely as it is, has fewer options than the PC environment. When companies like Casio or Sharp create modules for sharing data from their electronic daybooks, it's usually for PCs. Writers who use Macs have the same need for a good, portable laptop as anyone else, but there have been few products like *LapDOS* in the Mac world to allow Macs to tap easily into the funky potential of Tandy portables.

This is changing, however. In the May 1990 issue of *Portable 100*, Joseph Holmes reviewed Cabochon's *WPduet*—a program that allows WP-2 users to transfer files to and from their Macintosh computers. *WPduet* represents a major advance in Macintosh computing. Finally Mac owners can enjoy the portability and synergy that most *P100* readers take for granted.

But wouldn't it be nice, I thought, if Mac owners also had the option of using the one that started it all: the Model 100/102? After all, there is more Model T lore out there than for any other laptop portable, and the generic nature of the Model T makes it a natural for the Mac environment. I also keep seeing used Model T's going for a song—making them an inexpensive investment. My take was that the only thing preventing Mac users from embracing the Model T was the absence of a product like *WPduet* that would make the process of transfers easy and, well, more Maclike.

Software author Scott Andersen, creator of *WPduet*, must have been thinking along the same lines. His company, Cabochon, has released *100duet*, a package for connecting Macs to Tandy 100's, 102's and Tandy Portable Disk Drives.

100duet sells for the same price as *WPduet*: $99.95. Included in the package is a Mac disk containing the software, a manual, and a cable used to connect the Mac and the Model T. The package also contains a cable converter that allows a Tandy PDD-1 or PDD-2 to connect to the Mac.

There is more Model T lore out there than for any other laptop portable.

INSTALLATION

I tested *100duet* on my Macintosh SE. *100duet* has an interesting installation procedure. The Mac side is easy. The *100duet* software comes on a universal Macintosh 400K disk, which you copy to the folder of your choice.

To start *100duet*, you double click on the software's icon—a miniature picture of a Model T. The rest of the installation procedure involves the Model T itself, which must be connected to the Mac via the connecting cable. The Model T must be supplied with a program called *DUET.CO* in order to communicate with the Mac. In one of the most ingenious software tricks I've yet seen, *100duet* loads *DUET.CO* directly from the Mac into the Model T's RAM. When *100duet* is running on the Mac, you select *Install 100duet on the Tandy Portable* under the *Direct* menu, which displays the following message:

Enter BASIC on the M102 and type

CLEAR 255,61800
RUN "COM:57N1ENN"

then press the OK button

At this point the transfer takes place, and in a minute or so, the Model T contains *DUET.CO*, an 1100-byte program that must always reside in RAM during a *100duet* hookup.

If, for some reason, Model T *BASIC* doesn't return an *OK* when the instructions are entered, the manual provides alternative instructions for making the transfer. It also describes the problems that might be affecting the intended operation. Fortunately, my own setup worked fine the first time.

CAUTION: the *100duet* manual warns that running *DUET.CO* on your Model 100/102 will destroy *FLOPPY.CO*, if that is your disk access program. The manual suggests that you must reload *FLOPPY.CO* from the original disk any time after you run *DUET.CO*. However, if you don't have an active version of *FLOPPY.CO* in RAM, you can't very well reload it from a disk copy. There's a chicken-and-egg dilemma here, so think this one out for your own operation. I decided it was time to start using *TS-DOS* instead of

FLOPPY.CO—something I had put off through sheer inertia. But *100duet* is so slick I was motivated to make the change.

TRANSFERS

Once *DUET.CO* is loaded on the Model T, you simply highlight it with the cursor bar when you're cabled to the Mac. Then you double click on *100duet*. In a sense, *100duet* is the reverse of *WPduet*. While *WPduet* turns the Mac into a server controlled by the WP-2, *100duet* turns the Model T into a server controlled by the Macintosh.

If the Model T *DUET.CO* program has been started when *100duet* kicks in, an onscreen catalog of the files in RAM is displayed in a window captioned *Model 100 Files*. If not, then RAM can be catalogued by pulling down the *100duet Pdisk* menu and clicking on *Catalog*. From the window you can click on the files you want to transfer and then click on *Copy selected files to the Mac* from the *Pdisk* menu. If you have created folders within the *100duet* folder for storing data, the program gives you the option of targeting which folder you want the program to copy the files to. Copying takes place very rapidly.

File transfer goes both ways, natch. The *Copy a Mac file to the portable device* option of the *Pdisk* menu sends files the other way. Another option on the *Pdisk* menu is *Choose portable device*. The three options are connecting to an M100/102 directly, connecting to a PDD-1 or bank 1 of a PDD-2, or connecting to bank 2 of a PDD-2.

Like *WPduet*, *100duet* is a self-contained disk management system. It offers the ability to delete files from the Model T or its disk drives, and it can format and duplicate disks.

If used in no other way, *100duet* turns a Mac into a useful Model T disk drive. But simple storage and transfer is only part of *100duet*'s talents.

TRANSLATORS

One of the most useful features of *100duet* is its ability to translate native Model T files into files that can be used by Macintosh word processors. The options on *100duet's Translate* menu are *NO TRANSLATIONS* (the default), *Text*, *Text with CRs*, *MacWrite*, and *Rich Text Format*.

The *NO TRANSLATIONS* option is used for storing files on the Mac—using the Mac as a Portable Disk Drive. The files are unchanged in any way. These are not usable by Mac word processors while they're in native format because of the CRLF (carriage return/linefeed) line endings. Macs use only CR for ASCII files, generally referred to as "text" files in the Macintosh world.

Like *WPduet*, *100duet* is a self-contained disk management system.

The *Text* option takes a native Model T *.DO* file, strips the line feeds, and retains the paragraph-per-line layout of the file. This allows it to be imported into nearly all Mac word processors as a plain-vanilla ASCII file. Using the *Text* option is equivalent to the way Model T files are usually sent to PC word proces-

RICH TEXT FORMAT AND THE MODEL T

Microsoft's Rich Text Format (RTF) commands can be embedded into a Model T file for use with *100duet*. Figure 1 is a list of attributes and commands that tested well when translated to RTF by *100duet* and imported into *Microsoft Word* on the Mac. Note that in the following examples, the backslash (\) key is created on the Model T by *GRPH-hyphen*, that <*space*> indicates the Model T spacebar, and that the *0* in the ending sequences is a zero. The <*space*> is a critical part of the sequence. To get a space between words in your text, you need to enter a combination that looks like <*begin code*><*space*>< your word or phrase><*end code*> <*space*><*space*> <more words>, etc. Note the <*space*> <*space*>.

Why don't the underline commands use a zero to end the way the others do? Anyone's guess. Microsoft's documentation indicates they should, but it doesn't happen in *Word*. Underline does not get turned off unless you use the explicit *ulnone* command.

Selecting font size is simply a matter of entering *fsx*<*space*>, where *x* is a value in half-points. To get 14-point type, for instance, you enter *fs28*<*space*> where you want 14-point to begin.

To select type faces, you use *fx*<*space*> where *x* is the number of the font you want. Figure 2 lists the available typefaces.

Microsoft provides a complete description of Rich Text Format in *Microsoft Word for Windows Technical Reference*, Microsoft Press, 1990.

Attribute:	Begin	End
Bold	\b<space>	\b0<space>
Italic	\i<space>	\i0<space>
Underline (incl spaces)	\ul<space>	\ulnone<space>
Underline (words only)	\ulw<space>	\ulnone<space>
Strikethrough	\strike<space>	\strike0<space>
Outline font	\outl<space>	\outl0<space>
Shadow font	\shad<space>	\shad0<space>
Plain (normal)	\plain<space>	

Figure 1. The Rich Text Format codes that allow you to transfer files from a Model 100 to a Macintosh and command a variety of powerful attributes.

\f0<space>	Chicago
\f1<space>	New York
\f3<space>	Geneva (the *100duet* default)
\f4<space>	Monaco
\f13<space>	Zapf Dingbats
\f14<space>	Bookman
\f15<space>	Helvetica Narrow
\f16<space>	Palatino
\f18<space>	Zapf Chancery
\f20<space>	Times
\f21<space>	Helvetica
\f22<space>	Courier
\f23<space>	Symbol
\f33<space>	Avant Garde
\f34<space>	New Century Schoolbook

Figure 2. The RTF font codes you can embed in your Model 100 text, which change the typeface when you transfer the text to the Macintosh.

sors.

The *Text with CRs* option is somewhat bizarre. It inserts hard returns on every line as the line appears on the Model T screen—which means a line contains a max of 40 characters. Unlike the Model T's *TELCOM* program, you are not given the option of stating a preferred line length. I'm still scratching my head wondering what this option might be good for.

The *MacWrite* option puts the Model T file into a binary format that nearly every Macintosh program can import. Because of this, *MacWrite* format is a valuable option.

The most interesting option is *Rich Text Format* (RTF). RTF is a Microsoft format designed for interchanging complex documents with embedded font and formatting information. RTF files have become the interchange standard in the Mac world and are starting to appear in the PC world. Given that a native Model T file has neither font nor formatting information in it, RTF at first might seem like overkill, but stay tuned. There are some interesting games you can play with this one.

RICH TEXT FORMAT TRICKS

One of the strengths of the Model T is also one of its drawbacks: its plain-vanilla, ASCII file structure. Although this makes the files about as portable as they can be, it also places limitations on embedding attributes in a text while you write. In writing reviews like this, for instance, it is useful to embed italic markers around software names and boldface markers around breakheads as they are entered. You can easily forget to do this later when editing on the desktop machine.

100duet provides for embedded RTF commands.

On PC platforms I usually do my embedding by entering *WordStar* attributes such as ^S for underscoring, ^B for boldface, and ^Y for italics. These are entered easily by prefacing each with the Model T's ^P keystroke for allowing control characters to be embedded in the file. This works well for Model T files transferred to MS-DOS because I can either use *WordStar* itself as my word processor, or tell *WordPerfect* or *Word* that I'm using a *WordStar* file and it translates appropriately.

Unfortunately, my *WordStar* trick doesn't work on the Mac. But *100duet* provides hooks for a different trick: embedded RTF commands. By inserting RTF commands directly into the Model T and using *100duet*'s RTF translator, you can exert an impressive amount of control over text formatting.

For example, if you want a word or phrase in italics, enter *i*<*space*>my italic phrase*i0*<*space*><*space*>. The backslash (\) on the Model T is created by pressing the *GRPH-hyphen* key combination. The <*space*> in the preceding example indicates the Model T spacebar. Note: spaces are not simply important, they're *critical*. The space is the RTF delimiter. If you leave it out, the next word following the RTF command disappears when you import the RTF file into a Mac word

processor.

Likewise you can control fonts. The RTF file created by *100duet* will put you in Geneva font. If you'd rather be in Palatino, you enter the RTF command *\f16<space>* where you'd like Palatino to start. You can also control font size. Inserting *\fs48<space>*, for instance, would put you in 24-point type.

All the above examples, plus many more, worked well when I embedded them in Model T files, translated them to RTF with *100duet*, and imported them into *Word* 4.0 on my Mac. These tricks should also work for WP-2 users who use *WPduet*. (See sidebar on RTF for more examples.)

CONCLUSION

The Model T-Macintosh link is an easy one to enjoy. Each partner benefits from the arrangement and each offers something unique and individual. *100duet* is the conduit that makes the partnership possible and practical.

If you know people who own Macs who also look longingly at your Model T, let them know about this product. It could be just what they've been looking for. If you're a Model T owner who hasn't yet decided on which kind of desktop system to purchase, it's nice to know you have the option of looking seriously at the Mac and still maintaining your relationship with your favorite portable.

There is very little to find fault with in this product. The inability of *DUET.CO* to coexist with *FLOPPY.CO* is unfortunate, but with Model T's you sometimes have to make hard decisions about which disk manager to use. The *Text with CRs* translation facility would make more sense if it prompted you for a preferred line length. I sometimes forget to set the translators from their default. It would be nice to be able to set up a profile that would allow you to set your own defaults. Another thing I'd like to see changed is the *Creator* assigned to RTF files on the Mac. If you double click on them you are launched into *MacWrite*, which can't even import an RTF file. It would be more useful to be launched into *Word*. Better yet would be the ability to customize a profile to allow RTF files to launch into the word processor of your choice.

But these are quibbles. Overall, *100duet* is one nice product. I enjoy using it, and I think it will make a contribution equal to *WPduet* for Mac users in search of a portable companion. It's become an important element in my Macintosh environment.

You can communicate with Gene via CompuServe (his ID is 72435,732), through regular mail via the Portable 100 *magazine address, or direct: 91 Inglewood Drive, Mississauga, Ontario, Canada L5G 1X9 (be sure to include sufficient postage if you mail to Canada.) Please enclose an SASE when requesting a reply.*

Editor's note: *To use* 100duet *with a Tandy 200 requires a program called* The Loader, *available for about $15 from Club 100. See their ad for address and phone numbers.*

PRODUCT SPECIFICATIONS & SUPPLIERS

100duet (M100/102—Mac)—$99.95
Shipping and handling—$3.00

(Quantity pricing available)

Cabochon, Inc.
1740 Massachusetts Avenue
Boxborough, MA 01719
(508)264-4648
(508)273-9627 (fax)
CompuServe: 72167,142

COMPATIBILITY: Model 100/102 (All Tandy laptops through MS-DOS 2810 HD, with minor changes).

Flying by the Seat of Your Portable

The quick way to a decision when density altitude and humidity are high.

by Sean G. Dwyer

Why are portable computers the answer to a private pilot's dreams? Their small size and contributions to safety are two reasons. In addition to providing legally required weather information via computer weather services, portable computers allow the pilot to take his computing capability to the hangar and even to mountaintop retreats. Speaking of mountaintops, that brings up the subject of *density altitude.* ...

WHEN IS HIGH HIGHER?

The concept of density altitude was invented to compensate for nonstandard temperatures (different from 59 degrees Fahrenheit), and most aircraft performance charts are based on it. In a nutshell, cold air is denser than warm air and therefore provides more lift as it passes over a wing. Height above sea level also affects air density. The higher you go, the less dense is the air.

Density altitude combines both factors and provides pilots with a measure of the "effective altitude" at a particular time and place. Pilots use density altitude to predict rate of climb and how much runway they need to take off on hot days or from high elevation airfields. A runway may simply not be long enough for a plane to get the necessary speed for takeoff, or the aircraft may not have sufficient lift after takeoff to climb above a nearby treeline.

HOW THE PROGRAM WORKS

DENALT.BA, at 1.6K, has two parts. The first part determines the density altitude and provides a correction for the effect of humidity. This information is then combined with the performance charts for N4500R, an early model Piper Cherokee, which I'll refer to as "Zero Zero Romeo" (that is aviationspeak and has no romantic or heroic connotations). Of the forty lines in the program, thirteen apply specifically to Zero Zero Romeo; you should change them to reflect the different performance of other aircraft.

Lines 30-40 estimate the equivalent temperature rise because of humidity and require you to enter the dew point, the temperature at which the air would be saturated with moisture, reported hourly by larger airports.

The equation on line 40 was generated by a curve fitting exercise run on a table of data presented by E. Allan Engelhardt at a forum during the 1990 Experimental Aircraft Association Fly-in at Oshkosh, Wisconsin. With fifteen thousand aircraft, mostly privately owned, and over a hundred thousand daytrippers and campers, the Oshkosh Fly-in attracts aviation enthusiasts like a fresh cow patty attracts flies. A lot of cutting edge aviation technology and concepts surface there first. Prior to Engelhardt's seminar, I had never seen any numerical way to account for the effects of humidity.

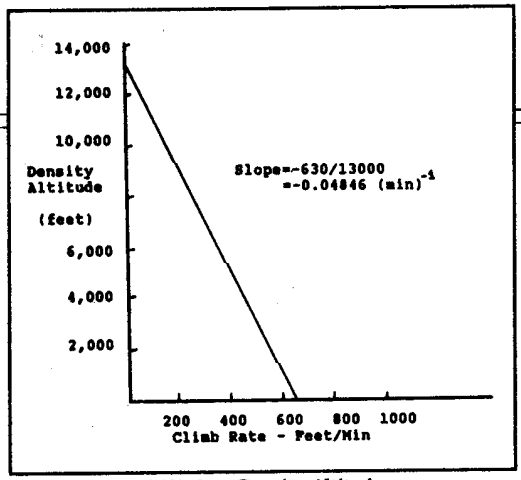


Figure 1. Rate of Climb vs Density Altitude.

```
Dry Grass:+15%____Headwind:-10%/10mph
Equiv Temp Rise due to Humidity= 0
Est. Density Altitude(feet)....= 6993
Est. Climb Rate(feet/min)......= 291
Est. Take-off Distance(feet)...= 1688
Est. Take-off Dist.50ft Obsto'l= 3788
Run program again? (Y/N)
?
```

Screen 1. Denver (5333 feet MSL) at 66 degrees F. Dew point zero.

DENALT.BA either uses the dewpoint information or ignores it in the calculation of density altitude. But note that humidity has a surprising influence at higher temperatures.

Density altitude is determined in lines 50-75 where pressure altitude is corrected for the ambient temperature, both of which have to be typed in. If you provide the dewpoint information in line 35, the equivalent temperature rise because of humidity is added to pressure altitude in line 70. Pressure altitude is another artificial altitude and is determined by setting an aircraft's altimeter to the standard pressure, 29.92 inches of mercury.

Setting your altimeter is simple enough if you are near your airplane. However, if you are back in a motel, you can approximate with the elevation of the airport above sea-level.

The density altitude calculation on line 75 was derived from a spreadsheet program described in an article by Chester Peterson and Mark Lindshield in *Private Pilot* magazine.

If the program went no further than this point, it would still be useful to a pilot. This far, all the required inputs could be obtained from a weather report and an aviation map, so you can make a more precise determination of pressure altitude in the airplane itself.

DENSITY ALTITUDE AND PERFORMANCE

Lines 100-190 combine the density altitude calculated above with the performance charts of Zero Zero Romeo (or

```
10 REM Aircraft Performance Vs Density A
ltitude & Humidity (c) Sean G. Dwyer 12/
29/90
30 PRINT:PRINT"Program estimates impact
of Temperature, Density Altitude & Humid
ity on aircraft performance. Press ENTER
 if Dew Point  is unknown:"
35 PRINT"What is the Dew Point in Fahren
heit?":INPUT A
40 K=(2.88315-(0.12617*A)+0.00223*(A^2))
:IF A<31 THEN K=0
50 PRINT:PRINT:PRINT:PRINT"To get Pressu
re Altitude set altimeter  to 29.92 (or
use field elevation as an  approximation
):":PRINT
60 PRINT"Enter Pressure Altitude in feet
":INPUT P
65 PRINT"Enter Temperature in Fahrenheit
:":INPUT F
70 K=INT(K):F=F+K
75 D=145300*(1-(518.4/(F+459.4)*(1-P/145
300)^5.255)^0.235):E=INT(D)
95 RV$=CHR$(27)+"p":NV$=CHR$(27)+"q"
99 PRINT"=============== RESULTS ======
=======
100 PRINT"Standard Performance for N4500
R Assumed":REM Lines 100-199
105 PRINT"Dry Grass:+15%____Headwind:-10
%/10mph"
110 C=630:T=800:G=1687:REM Std climb rat
e, Take-off, and distance to clear 50' o
bstacle under std conditions
120 L=C-.04846*D:L=INT(L)
130 H=T+D*(.127):H=INT(H)
140 IF D>3299 THEN 160
150 B=G+D*(.2464):B=INT(B)
155 GOTO 170
160 B=G+812.87+(D-3299)*(.3489):B=INT(B
)
170 IF D>7000 THEN 190
180 IF D>0 THEN 900
185 L=630:H=800:B=1687:PRINT RV$;"Negati
ve DA!";NV$;"Standard CR & TO assumed":G
OTO 900
190 L=0:H=0:B=0:PRINT RV$;"Performance a
t D.A.>7000 is unknown!";NV$
195 GOSUB 991
900 PRINT"Equiv Temp Rise due to Humidit
y=";K
910 PRINT"Est. Density Altitude(feet)...
.=";E
920 PRINT"Est. Climb Rate(feet/min).....
.=";L
930 PRINT"Est. Take-off Distance(feet)..
.=";H
940 PRINT"Est. Take-off Dist.50ft Obstc'
l=";B
970 PRINT"Run program again? (Y or N)":I
NPUT Q$
975 A=0:K=0:E=0:L=0:H=0:B=0:F=0:D=0:IF Q
$="Y" OR Q$="y" THEN 30
```

Listing 1. DENALT.BA *calculates "density altitude" so you can take off and land your airplane safely.*

revised to suit your aircraft type and vintage). Line 105 provides a correction for grass runways and head winds (grass extends takeoffs; head winds reduce take-off rolls).

Line 110 sets the standard climb rate (630 feet per minute), take-off distance (800 feet) and take-off distance to clear a 50-foot obstacle (1,687 feet), all three numbers calculated under "standard" conditions, i.e., at sea level, with no wind and 59 degrees Fahrenheit. This information is available in the airplane flight manual, which has to be in the aircraft any time it flies.

Line 120 estimates the climb rate under ambient conditions by subtracting density altitude from the standard climb rate and multiplying the result by the slope of the density altitude vs. climb rate graph from the standard climb rate at sea level. You can get this negative slope from a graph found in the airplane flight manual.

Line 130 calculates the take-off distance at the determined density altitude by multiplying the density altitude by the slope of the density altitude vs. take-off distance (also found in the airplane flight manual), and adding the result to the standard take-off distance.

I used the same logic in lines 140-160 to calculate the take-off distance to clear a fifty-foot obstacle, with the exception that it has to be done in two steps at higher density altitudes because of the nonlinearity of the density altitude vs. takeoff (50-foot obstacle) curve for Zero Zero Romeo.

I've made liberal use of the *INT(X)* command throughout to eliminate decimals.

EXCEPTIONS

Two exceptions occur in the calculations—first, when the program determines the density altitude in excess of 7,000 feet (lines 170 and 190) and, second, when it calculates the density altitude as below sea level (line 185).

```
98Ø IF Q$="" THEN 97Ø
99Ø END
991 Z=1
992 S=783
993 SOUND S,1:S=S-38:Z=Z+1:IF Z=4Ø THEN
999
995 IF S<415 THEN 992
996 GOTO 993
999 RETURN
```

End of listing 1.

Because Zero Zero Romeo's airplane flight manual contains no performance information above 7,000 feet density altitude, the pilot would in effect be a "test pilot" when attempting a takeoff under these conditions. I adhere to the aphorism that there are old pilots and there are bold pilots, but there are no old, bold pilots. Conseequently, the program sets all performance parameters to zero and triggers an audible alarm (lines 991-999) when it estimates unacceptably high density altitudes.

HIGHLAND ROULETTE

While the performance charts for N4500R may not go above 7,000 feet density altitude, this does not mean that the airplane cannot fly at those altitudes. However, high speed through the air is necessary, a potential problem during takeoff and landing. If you run through the numbers for a 66-degree day at Denver's 5,333-foot Stapleton Airport you will find that a fully loaded Zero Zero Romeo would require 3,788 feet to clear a 50-foot obstacle and have a climb rate of less than 300 feet per minute (Screen 1). That would be one of the times to leave out some baggage and only half fill the tanks. Thank goodness the M100 is light!

A temperature of 90 degrees at Denver would trigger the alarm, as the density altitude would be more the 3,000 feet higher than Denver's true elevation of 5,333 feet above sea level.

BELOW SEA LEVEL?

Can density altitude be below sea level? Easily! All it takes is cold temperature. A zero degree day in Chicago has a density altitude around minus 3,300 feet. On cold days, aircraft climb faster and glide farther, even to the point where one may have difficulty landing on short runways. Lines 180 and 185 in

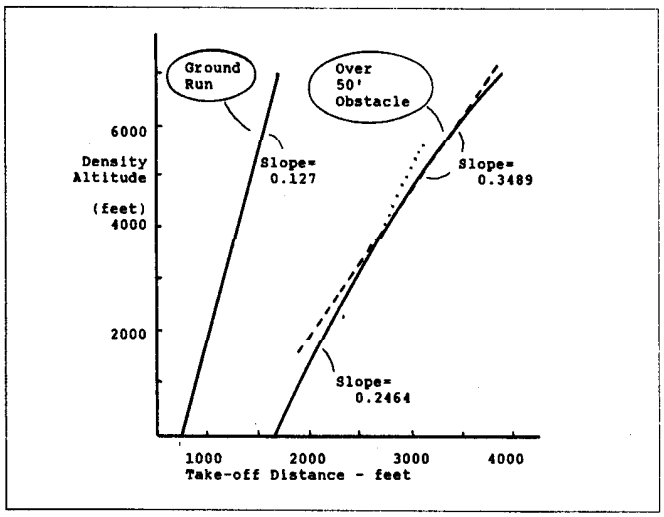


Figure 2. Take-off Distance vs Density Altitude.

A	Dew point in degrees F
B	Estimated take-off distance over 50-foot obstacle
C	Standard rate of climb in feet/min at sea level, 59F, and no wind
D	Calculated density altitude before truncation
E	Calculated density altitude truncated to whole numbers
F	Ambient temperature in degrees F
G	Standard take-off distance over 50-foot obstacle at 59F, no wind, 0 msl (sea level)
H	Estimated take-off distance in feet
K	Equivalent temperature rise due to humidity
L	Estimated rate of climb in feet per minute
P	Ambient pressure altitude in feet
T	Standard take-off distance at 59F, no wind, and sea level
Q$	The Y or N response to a question
RV$	Switches the inverse display on
NV$	Switches the inverse display off

Figure 3. The variables for the Model 100 program DENALT.BA.

DENALT.BA were written to set all the performance parameters to a sea level (zero feet) density altitude whenever the calculated density altitude is below zero. Otherwise the program would indicate that aircraft could take off by going backwards on really cold days.

HIGH HUMIDITY SURPRISE

Let us assume that we are departing from a 2,000-foot runway near New Orleans on a 95-degree day with a dew point of 80 degrees. The manual for Zero Zero Romeo says that the standard take-off distance at sea level is 800 feet, 1,687 feet to clear a 50-foot tree. With 2,000 feet of runway available, that powerline near the airport should be no problem, right? WRONG! The high humidity has the effect of raising the already high temperature by a further 7 degrees. My trusty M100 tells me that I will need 1,143 feet just to get airborne and 2,353 feet to clear a 50-foot obstacle ... all because of the density altitude. Better find out just how far away that powerline is from the runway.

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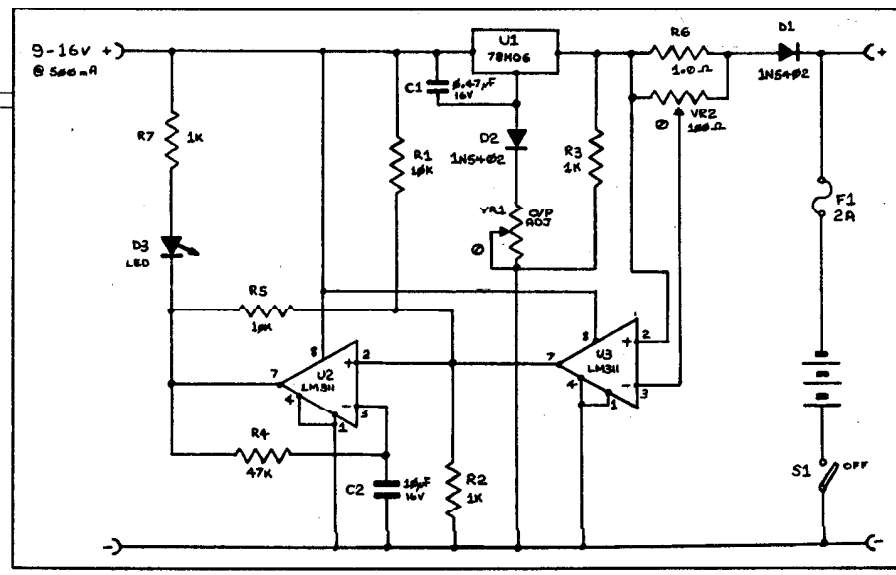
COMPATIBILITY: **Model 100, 102, 200, some printers and other and other accessories.**

Uninterruptible Power Supply

This UPS delivers overnight and then some!

by Adrian Ryan



This article describes the design and construction of an Uninterruptible Power System for the Tandy Model 100 computer system and peripherals. One of the prime virtues of the Model 100 and its clones is its ability to run for an extended period from its internal power source. Typically it runs continuously for about 30 hours on one set of AA cells. This is in direct contrast to my Toshiba 1100+, which can manage about 6 to 8 hours maximum. Those using an MS-DOS laptop equipped with an internal hard disk experience even shorter running times.

Nevertheless, for some applications even 30 hours is too short. Then you have to consider an external power source.

WHICH BATTERY TO USE?

Out of a number of candidates, the reliable 6-volt sealed gel cells are probably the most attractive, especially since they are readily available on the surplus market at very reasonable prices. Using the battery with the computer is simply a matter of connecting it to the machine via a suitable connector. But the problems arise when you recharge these cells. Thus, the charger design of this article has evolved to cater for the specific needs of a sealed lead-acid battery system.

To have the greatest battery life, you should ensure that both the charge and discharge currents are within the capabilities of the battery. The capacity of the cells is quoted in ampere-hours (A-H), and is denoted by the symbol C. In the case of the lead-acid cells, the maximum recommended continuous discharge current is usually quoted as C/10; thus, a 4 A-H cell should not be subjected to a continuous discharge current in excess of 4/10 A or 400 mA. Similarly, to ensure best life, the recharge currents should be in the range C/10 to C/5.

This does not mean that you cannot obtain far higher currents than this, just that the average current should be in this range. For example, my TRP-100 thermal printer draws about 180 mA most of the time, but when performing a CR/LF (carriage return/line feed) it draws a peak current of about 1.5 A. So it could be powered quite easily by an external 2 A-H battery without exceeding the design ratings.

Most manufacturers quote a maximum current that can be drawn from the cells, and this is usually between C and 2C. Thus, a 4 A-H battery is expected to be used in conditions where the average discharge currents are on the order of C/10 or 0.4 A, and the peak currents are no greater than C to 2C (in other words, 4 to 8 A) while the expected charge currents are in the range of 400-800 mA.

DISCHARGE TIME

To estimate the discharge time requires that you have a knowledge of the typical currents involved. Table 1 shows the current consumption for various load conditions for my Model 100. RY1, the cassette motor relay, can be turned on and off with the command *MOTOR ON/*

VOLTAGE	POWER STATE (mA) A	B	C	D	E	F
6.00	50.5	55.0	99.0	144.0	187.5	194.0
4.05	72.0	78.0	105.0	137.0	170.0	176.0

Table 1. Electrical current consumption for different power states for the Model 100, used to estimate amount of time the computer can be left to run on batteries. A-CPU alone; B-CPU and beeper; C-CPU and RY1 (the cassette motor relay); D-CPU, RY2, and RY3; E-CPU, RY1, RY2, and RY3; F-CPU, RY1, RY2, RY3, and beeper.

OFF, and RY2 and RY3 can be turned on with the command *CALL 21200* and turned off with *CALL 21179*.

To measure the beeper current, I used the command *SOUND 512,255*. My Model 100 turns on the *LOW BAT* (low battery) LED at 4.05 volts.

Table 1 summarizes the current consumption for various states. State A is the CPU alone. In this mode the machine is turned on, but no relays are energized. State B is the CPU plus the beeper. State C is the CPU plus RY1 energized. State D is the CPU plus RY2 plus RY3 energized. State E is the CPU plus RY1, RY2, and RY3 energized, while State F is the CPU, RY1, RY2, RY3, and the beeper.

It is unlikely that power states E and F will occur in practice. State C is only likely to persist for comparatively short periods, and unless the machine is to be connected to a phone line for long periods, even state D will be of short duration.

NO BABYSITTERS NEEDED

In my case, I needed to leave the machine on and unattended in state A, monitoring an external sensor for several weeks, and I wanted to be sure that even an extended power outage of perhaps a day would not cause any loss of data. Since I was storing the data in RAM, I needed no external storage, since I had more than sufficient memory to permit several weeks of operation.

A typical alkaline AA cell has a capacity of about 1500 mA-H, or about 1.5 A-H. (Actually, this capacity is achieved only when either the discharge current is low or the duty cycle is low.) Thus, in the above application, by powering the machine with the external AC adaptor, I could expect the system to survive a one-time power outage of no more than 30 hours, or a sequence of shorter outages whose total did not exceed 30 hours, assuming a continuous current drain of 50 mA.

Although it is possible to modify the Model 100 to use internal rechargeable nickel cadmium cells, their capacity is considerably less than a comparable dry cell. A NiCd AA cell has a capacity of about 450 to 500 mA-H compared with about 1500 mA-H for an alkaline cell. Thus, although there would now be a recharge capability, one could tolerate only about 8 to 10 hours interruption of primary power.

Thus for my application only an external battery system was suitable. In my case I chose a 6-volt, 2 A-H battery, which would power my system for about 40 hours, and could be recharged in about 5 hours.

This gas production leads to a high internal pressure.

BUT MONITOR THE CHARGER

But you have to pay attention to the charger. During charging, the electrical energy is converted into chemical energy, and at least in a sealed cell, it produces little gas. When the cell is fully charged, however, the electrical energy is dissipated partly as heat but also by electrolysis, producing hydrogen and oxygen from the water in the electrolyte. This gas production leads to a high internal pressure, and eventually to cell failure. Consequently, you must find some means to sense the state of charge of the cells and to reduce the charge current drastically when the battery is fully charged.

Fortunately, the terminal voltage of a lead acid cell is a good indicator of the state of charge. At 20 degrees Celsius, the nominal terminal voltage of a fully charged cell is 2.3 volts plus or minus 30 mV. So for a 3-cell battery the final terminal voltage is 6.90 volts plus or minus 90 mV (from 6.81 to 6.99 volts). When the battery voltage has risen to this level, you must either terminate or reduce the charge current to a very low level. Also, when the battery voltage is very low, you must limit the charge current to some suitable value.

In my case I chose to limit the current to 500 mA in order to reduce the recharge time. Although this is higher than the previously mentioned C/10 rate, an inquiry with the manufacturer revealed that, provided that the battery was not overcharged at this current, there would be no appreciable reduction in life. Thus evolved the requirement for a Voltage Limited-Taper Current charger.

THE RESULT

The heart of this is U1, a three-terminal voltage regulator. I chose a 78M06, since it has a maximum output current of 500 mA. Although the output voltage is less than required, since a constant current flows in the ground lead of a three-terminal regulator, by inserting an adjustable resistor in this lead it is possible

to set the output voltage to any desired value.

To prevent the battery discharging into the output terminal of the regulator in the absence of primary power, I inserted a diode (D1) in series with the output. To compensate for the forward voltage drop introduced by this diode, I inserted a similar diode (D2) in the ground lead in series with the output voltage adjustment resistor.

A LITTLE FINESSE

While with correct adjustment this is enough, I added a little more finesse to the unit, an indicator to show the state of the charger. I dislike black boxes that simply sit there and give the user absolutely no indication of whether they are working or just sulking.

In this case, the added circuitry flashes an LED (light-emitting diode) to indicate that the unit is powering a load and charging the battery, or a steady illumination of the LED to indicate that primary power is present and that the battery is fully charged.

The heart of this is U2. This is a differential voltage comparator configured as a simple relaxation oscillator with a frequency of about 2 Hz. If we neglect U3, then U2 is connected as a Schmidt Trigger with positive feedback being provided by the 10K resistor R5. When C2 has charged up sufficiently to reach the upper trip voltage, the output voltage abruptly falls and the LED D3 illuminates as a result of the current flow into the output terminal of the comparator.

As a result of the feedback provided by R5, the reference voltage at the noninverting input is now lower. C2 commences to discharge toward this lower trip point. As soon as it reaches this voltage, the output voltage abruptly rises, and the LED extinguishes. The reference voltage has also risen, and the cycle will repeat.

In series with the output terminal of U1 is a 1-ohm current-sensing resistor R6. As charge current flows through this resistor a small voltage is developed across it. If this voltage is large enough, the sense of this voltage causes the output transistor of the differential comparator U3 to be cut off.

In this condition, the oscillator U2 blinks the LED. When the battery voltage rises so that it is essentially the same as the output voltage of U1, the charge current also falls to a very low value, only that required to maintain the cell voltage. At this low current, the voltage across the sense resistor is insufficient to trip the comparator and the output transistor is driven into conduction, thus shorting the noninverting I/P terminal of U2 to ground. In this state U2 will no longer oscillate, and the LED will be constantly lit.

By adjusting the sensitivity with VR2, this state can achieved at a suitably low value of idling current; in my case I chose 15 mA. R3 provides a path for output current in the event that the battery switch S1 is opened.

Fuse F1 is *essential* to protect the unit from short circuits. **DO NOT BE TEMPTED TO ECONOMIZE BY OMITTING IT!** A fully charged battery can supply well in excess of 30 A into a dead short, and if there is no fuse this can have disastrous consequences. Quite apart from the ability to vaporize the fine tracks on printed circuit boards, it also has the potential fire hazard. Put it this way—on one occasion this fuse saved my day!

To power the charger I chose the Radio Shack 9-volt/500 mA AC adaptor (part number 273-1651), although any DC supply between 9 and 12 volts and capable of supplying at least 500 mA would be suitable. Remember to mount U1 with an insulating washer on a suitable heat sink! Assuming an input voltage of 12 volts and a battery voltage of 3.6, the regulator supplies 500 mA and dissipates 4.2 watts, so to maintain a junction temperature of less than 125 degrees Celsius requires a heat sink having a thermal resistance no worse than 15 degrees C/watt. I used the box in which the unit was mounted.

ALMOST DONE

Having built the unit, you should now adjust it correctly. This requires the use of an *accurate* digital voltmeter and a current meter having a full-scale deflection of 1 A, as well as sufficient sensitivity to measure down to 10 mA.

Disconnect the battery by opening S1. Connect a 100-ohm 1-watt resistor across the output in place of the battery. Connect the digital voltmeter across the resistor and carefully adjust VR1 for a voltage of 7.00. Ensure that the battery is fully discharged.

Remove the 100-ohm resistor, close S1 and ensure that the charge current is of the order of 500 mA. Observe that the LED is blinking. Connect the digital voltmeter across the battery and monitor the terminal voltage. At the end of charge, adjust VR1 for a battery voltage of 6.90. Measure the idle current into the battery with this output voltage. It should fall to less than 15 mA. Remove the current meter and adjust VR2 until the LED lights continuously.

Now connect the 100-ohm resistor to the battery and observe that the LED starts to blink. Remove the resistor, and after a few seconds, the LED should stop blinking as the charger replaces the energy that was withdrawn from the battery. Monitor the battery voltage after a few cycles, and finally adjust VR1 to maintain the correct output voltage at full charge.

If the charge current into the battery does not fall to the 10 to 15 mA level at a terminal voltage of 6.90, you may have to adjust the output voltage to a lower setting. With a new battery the end of charge idle current is less than 10 mA. Surplus units of unknown ancestry may well require a somewhat different output voltage. My unit has been in operation since July '88 and has performed most satisfactorily.

The Great Vdebate

Two writers discuss "structured" programming.

1. Every program must begin with declarations of variables and program controls.
   A. *HIMEM, MAXFILES* and *CLEAR* must be first.
   B. State variable types (i.e., single precision, double precision, string, and integer).
   C. Every variable that will be an array must be dimensioned up front here.
2. Set variables to appropriate default values, read in any *DATA*, set preliminary starting conditions. Identify questions, menus, etc., and obtain responses right after the declarations. Preset all logic or on-condition variables to default or initial values.
3. Put all subroutines at the end as separate block-numbered modules.
4. Use only two alphanumeric characters for each variable name.
5. On every *IF ... THEN* line, put the *ELSE* condition or destination. Never leave it blank. Give the reader confidence that you know where or what the *ELSE* condition is.
6. When using *ON xx GOTO* statements, consider how the program would work if *xx* is undefined or outside of range.
7. Plan so that the structure of the program always has a downward flow, except for the return to the start of a loop. Always *GOTO* jump or *IF ... THEN ... ELSE* jump to an entry below the line on which it appears. Never jump back and forth. Do not use *GOTO*'s to make up for bad planning.
8. On looping, use the *FOR ... NEXT* statement set, if possible. On nested loops, set the *FOR* index of each "nest" higher alphabetically, so that errors in the sequence of *NEXT* statements can be more easily detected.
9. Develop the program in terms of modules. If there are repeating modules, or the modules are to be used in other programs, make them into self-contained subroutines. Build up programs from proven, error-free, previously developed modules. Build programs from reusable code.
10. Every subroutine must be able to stand by itself, have a defined function or purpose, start at the entry line or enter at succeeding lines, and end at a final *RETURN*.
11. Line number *BASIC* statements in terms of a set of numbers for modules, paragraphs, and "functions" (e.g., "function" in a broad context). Put lots of "air" between these groupings to allow for additions. Put in blank lines (i.e., *ENTER*) to group statements into paragraphs.
12. Flowchart, flowchart, flowchart! Write your program from it, so that the user does not need a flowchart to figure out what is happening. Develop all *IF ... THEN ... ELSE* branches to the end on your flowchart.

Figure 1. David A. Heiser's twelve rules for good BASIC *programs.*

POINT

I've gone over Dr. Verts' article on *VBASIC* in the March 1990 issue of *Portable 100*.

Writing *BASIC* programs without line numbers does not correct the fundamental problem of "garbage" programs. It may make it worse.

Any *BASIC* program must have a clear, readable logic flow. It should be easy to "walk-through," to identify all branches, and clearly to locate the "merge" points. A logical top-down structure is crucial to the identification of, and location of, errors. The program should be its own documentation, and be understandable after a couple thousand programs and several years later. (Twelve rules that I rather hastily put together are shown in Figure 1.)

As with all your articles, I read the article first, then start to read the *BASIC* code. When the code violates just about every aspect of "structured" programs, I give up. It's not worth my time to try and figure out what is happening. If I can't quickly establish the "flow," the variables, where the values come from, the "modules," etc., the program is a "bad scene." If I were to type it in and make an entry error, chances are it would be too difficult to find out where it was. I would have to say that Dr. Verts' program is in this category.

The program should be its own documentation.

A consecutive line-numbered *BASIC* program has an advantage. You know where to find the destinations. When you use a label, the reader does not know if the destination of the jump or branch is before or after the reference, and where in the program it is. I find it very tiring to have to search out obscure labels in a big program. This was one of the problems with the *PL/1* programming language. It still remains a problem with assembly language programs. Consecutive line numbers and branching to numbered lines at least make the code readable.

David A. Heiser
Carmichael, CA

COUNTERPOINT

I would like to thank Mr. Heiser for his thoughtful comments on my article and accompanying program. He raises several valid points in his letter, which I will address individually below. The major criticism he directs against the *VBASIC* program itself stems, I believe, from a slight misunderstanding.

When I submitted this article to *Portable 100* magazine, I included two versions of the *VBASIC* program. The first version (call it the source code) was written using the *VBASIC* format, with comments, wide 60-character lines, indentation, blank lines and lines of dashes separating subroutines and major code blocks, and many other additions to increase the readability of the program code. The second version (the object code) was the result of running the source through the translator: all blanks stripped out, comments eliminated, blank lines removed, etc.

My assumption was that *Portable 100* would print both versions of the program, the first to show the "correct" way of writing *VBASIC* code, and the second to provide people without access to the bulletin board a way of creating a running version of the program. Had both programs been published, there would have been little room in the magazine, if any, for other articles.

A "FOWL" DILEMMA

A classic "chicken-and-egg" problem would have occurred if the source code was published at the expense of the object code; there would have been no

way of creating a running version of the translator without having already obtained a running version. The publisher therefore decided to publish the "runable" version, and to post the *VBASIC* source on the bulletin board where people could get at it if they so desired.

Mr. Heiser's complaint that the program has readability difficulties, hard to trace dependencies among variables, unnecessary convolutions, and so forth, is because he is attempting to understand a version not meant for direct human consumption.

To quote Clifford Stoll in *The Cuckoo's Egg* (talking about password encryption), when you run a pig through a sausage grinder, turning the crank backward does not restore the pig. In some sense, computer language translators (compilers, assemblers, and *VBASIC*, for example) are programs that perform encryption. The result, while semantically equivalent to the original "plain text," is generally unreadable except to the process responsible for deciphering it (a decryption algorithm, *BASIC* interpreter, or computer hardware, as appropriate).

A DAUNTING TASK

The program is indeed complex, as it has a complex task to perform, particularly under the extraordinary constraints imposed by interpreted *BASIC* on the Model 100. It implements a simple type of two-pass assembler (in upper division undergraduate computer science courses an assembler is often assigned as a programming project requiring at least half a semester to complete, even when good high-level design tools are available). It also must run somewhat quickly, not be too large, and must perform at least perfunctory error checking.

These requirements are often contradictory; fast algorithms are frequently larger than simple ones, and full error checking may occupy as much as half the code space of any given program. It is even appropriate to resort to the use of some "tricks" in the coding, such as placing the most frequently called subroutines at the beginning of the program so the interpreter can find them quickly. The version that I submitted for publication represented the best compromise that I felt I could live with at the time.

In addition, this discussion might not have even occurred if I had originally released *VBASIC* as an optional plug-in ROM. Few people would have then questioned the convoluted and unreadable nature of the code residing there. If the facilities for developing ROM software become available to me, I will rewrite *VBASIC* appropriately.

Mr. Heiser's complaint reinforces my original claim. The code as published is unreadable, as are many programs submitted to magazines such as *Portable 100*. Unfortunately, those programs are written that way to begin with, and not produced as the result of a translation step.

This is the problem that I addressed: to provide humans a way of creating clean code that is easy to modify and debug, and a process for converting that code into a stripped, compressed, equivalent form for the computer to run. Given that the translator exists, it should now no longer be necessary for any of us to endure the publication of the type of programs that he so rightly pillories.

A JUMP INTO THE VOID

The one valid point he makes about line numbers is that when a jump is taken (via a *GOTO* or *GOSUB*), it is always possible to find the jump target independently of the context of the program. He is also correct in stating that when assemblers (the class of translators in which *VBASIC* is a degenerate member) resolve their symbolic labels into actual machine addresses, it is often difficult to find the line in the listing where a jump transfers control.

The benefits or evils of GOTO's becomes a nonissue when a language is properly designed

This is not a difficult problem to solve, and never has been. The symbol table needs to contain, besides the machine address of the symbol, the number of the line in the text where each symbol is defined. When a listing is produced, it is then trivial to print alongside the number of each source line the line numbers of the text that are targets of transfers of control. That many assemblers don't do this is not a fault so much of the assembly language itself as of the assembler program that performs the translation into machine code.

Yes, *VBASIC* suffers from the same problem. You cannot tell from *GOTO [Symbol]* whether *[Symbol]* occurs earlier or later in the program. At the risk of starting a religious argument, I assert that this is totally an artifact of the inadequacy of the underlying definition of *BASIC* implemented by the interpreter.

If proper control structures were included in the language definition to begin with, such as *WHILE ... DO, REPEAT ... UNTIL, IF ... THEN ... ELSE* (covering blocks, not just single lines), *CASE ... OF, LOOP ... EXIT ... END_LOOP*, and a *FOR ... NEXT* that isn't brain-damaged, almost all the jump labels would completely disappear. The only labels that remain would be procedure calls (*GOSUB*'s, if you will), and the occasional *GOTO* used in spaghetti code. The problem effectively ceases to exist.

The argument over the benefits or evils of *GOTO*'s in programming has raged for years in the computer science community. I don't intend to become embroiled in it now, except to say that I have found that it becomes a nonissue when a language is properly designed.

Any implementation of *BASIC* where line numbers are used as jump targets is not properly designed. (As I understand it, the creators of *BASIC*, Professors John Kemeny and Thomas Kurtz, originally never intended the line numbers to be part of the control mechanism. The Dartmouth Time-Sharing System operated in the middle 1960's using ten character-per-second teletypes as I/O devices; line numbers were used simply as an expedient to entering and editing program text. It is an unfortunate fact that, once the decision was made to use line numbers as jump points, it was next to impossible to undo the decision.)

Implementing advanced control structures in a simple language such as *BASIC* is not all that difficult. The original Microsoft *BASICA* for the IBM-PC (replaced by *GWBASIC*) has a form of the *WHILE ... DO* construct, and a god-awful 4K microcomputer *BASIC* I once used contained a bizarre form of the *REPEAT ... UNTIL*. Again, many upper division computer science courses have the implementation of an advanced compiler as a semester project (for subsets of *Pascal, Modula-II*, or *Ada*, all vastly more sophisticated than standard *BASIC*).

The only justifications for anyone to create line-numbered *BASIC*'s nowadays are that they are mature technology (i.e., very easy to build), and to keep them compatible with older versions. As modern dialects of *BASIC* have shown (e.g., Microsoft's *QuickBasic*), line numbers are artifacts of the past.

My intent was to provide a tool to help bridge the gap between the anarchy

of spaghetti *BASIC* and the more up-to-date visions of how programming should be done. I truly wish that *VBASIC* had not been necessary to create.

A DOZEN REPONSES

I would now like to address the twelve rules of Mr. Heiser's letter, in order and with consideration toward both *VBASIC* and programming in general.

Rules 1-3 (Declarations of controls, types, array limits, defaults, subroutine structure) I have no significant disagreement here. "Define before use" is good programming practice even in languages where defaults make reasonable assumptions about variable types.

As mentioned, however, targets of *GOTO*'s and *GOSUB*'s near the beginning of the code are found more quickly by the *BASIC* interpreter; those subroutines used most frequently should come first. In the *VBASIC* translator, the first statement is of the form *GOTO [MAIN]*, which jumps over the large block of subroutines. *Symbol [MAIN]* is the actual start of the program, where variables are initialized, types established, and so forth.

I truly wish it had not been necessary to create *VBASIC*.

For arrays, one exception must be made. *BASIC* is somewhat unique in its ability to declare an array dynamically (at run time) rather than statically (at compile time) as do many noninterpretive languages. This makes it possible to calculate exactly how much storage will be needed, then allocate for the array only that much and no more. To amend rule 1C, an array should be dimensioned as early as its limits are known.

Rule 4 (Variable naming conventions) Guilty as charged, but unrepentant. *BASIC* on the Model 100 supports variable names of arbitrary length, but discriminates between variables based only on the first two characters (obviously to simplify the interpreter). This means that variables *WHO, WHAT, WHEN, WHERE,* and *WHY* all refer to the same location in memory (i.e., variable *WH*).

I have been bitten by the problem of declaring two long variable names, only to find later that they really refer to the same place. This also occurs with two-letter names, although it is more of a shock to find that variables *MAGNITUDE* and *MAXIMUM* are identical because it is so very unexpected.

With careful programming, long variable names convey far more about the structure of a program than short two-letter abbreviations; Model 100 *BASIC* is deficient in that it allows long names but does not use the information when it is present.

Rule 5 (Always including the *ELSE* condition) No, sorry. I strongly disagree with this one. Use the *ELSE* where necessary, but having it jump to the following line is needlessly complex and cluttered. Inserting a new line after the *IF* statement also requires repair of that *ELSE* target; otherwise the statement becomes unreachable via the *IF*.

In addition, there should rarely be a case where the *THEN* clause branches to the next line after the *IF*; by use of de Morgan's Theorems the condition can be reversed, the *ELSE* clause promoted to the *THEN* clause, and the *ELSE* clause eliminated. This often simplifies the control flow.

Rule 6 (Undefined or out-of-range *ON GOTO* selectors) No argument here. Different *BASIC* interpreters treat out-of-range conditions differently; some abort the program, and some simply drop through to the following line. This is implementation dependent, although dropping to the following line (the Model 100 default) provides a convenient way of establishing an *OTHERWISE* clause. It would be preferable if the *ON GOTO* mechanism was a little bit more flexible, more like the *Pascal CASE* statement for example, allowing different scalar types and subranges in the switch.

Rules 7-8 (Downward flow, proper use of *GOTO*'s and *FOR ... NEXT*) No argument here, except to say that, with proper structures in the language, most of the reasons for these two rules would be eliminated. *GOTO*'s do not make up for bad planning; instead they tend to exacerbate it.

There should never be cases where a *GOTO* jumps to a block that performs some processing and then jumps back to the line below the first *GOTO*. This is partially an artifact of line numbers: running out of space between numbers requires either renumbering the program with extra space, or spaghetti-patching the block. There is no penalty in *VBASIC* for moving that block to its rightful place and eliminating the extraneous *GOTO*'s (except an extra retranslation step).

GOTO's and *IF ... THEN*'s are also

FOP

TS-DOS

My favorite Disk Operating System

A Product Review
by Richard Hanson
Founder Club 100

It's time to pack the trailer, hitch up the truck and head for the hills. I look forward to quality time with my wife and our two dogs. To relax and enjoy life a bit. To get away from it all. To commune with nature and breathe some fresh California mountain air. But before we leave, I better make sure we've got everything we need, including, of course, the computer. Ah yes, you may laugh and make fun but the work of a computer nerd is never done. But should I bring the Model 100 or the 200? And which disk drive? The TPDD1 or the TPDD2? Well, I'll pack both computers and both drives. Heck, there's plenty of room in the trailer. Besides, both Paula and I enjoy using our laptops; they're great thinking tools.

I plan on writing stuff. Nothing fancy, just lots of stuff. I'll use the TEXT program, built into the laptop, but will need disk access. Something fast, dependable and easy to restart after a cold start. I choose TS-DOS on ROM. TS-DOS is the only disk operating system available on ROM for the Tandy, Radio Shack Model 100, 102, 200 and NEC PC8201A laptop computers. TS-DOS is also available on bootable disk for all four computers and both drives. TS-DOS on disk requires only 6,500 bytes to operate. TS-DOS on ROM has no RAM requirements since the program runs from the ROM.

TS-DOS's easy to use menu presentation works like the built in Model 100 menu. You simply move the bar-cursor to the file you want then use the function keys and features of TS-DOS to manipulate that file. TS-DOS contains two menus: RAM File Menu, and Disk File Menu. Function keys and features act on files in the current menu. You go from the RAM File Menu to the Disk File Menu and back again with the [F4] function key.

RAM File Menu...

[F1] Save - copies the selected file to disk - prompts the user with A)ppend R)eplace or Q)uit, [F2] Kill - deletes the selected file, [F3] Name - rename the selected file, [F4] Disk - goto the Disk File Menu, [F5] DOS-ON/OFF - enable/disable the resident portion, [F8] Menu - return to the laptop menu,

Disk File Menu...

[F1] Load - copies the selected file to RAM - prompts the user with "Replace?", [F2] Kill - deletes the selected file, [F3] Name - rename the selected file, [F4] RAM - goto the RAM File Menu, [F5] Frmt - formats diskettes, [F6] Log - re-looks at the current disk in the drive, [F7] Bank - switches between bank 0 and 1 on the TPDD2, [F8] Menu - return to the laptop menu,

Features...

[T] - selection multiple files to Save, Load, or Kill, [G] - global tag for all files at once, [U] - remove tags, [P] - prints the selected file - SPACE/pause, ESC/cancel, [L] - display the selected file on the screen - SPACE/pause, ESC/cancel, [D] - prints the directory of the disk - using compressed mode you can make 3.5" diskette labels, [R] - compress/expand .DO files by 30% (ROM version only - works on files in RAM).

The resident portion of TS-DOS allows direct disk access while in TEXT and BASIC.

Commands in TEXT...

[F2] - load file from disk while in TEXT - appends file into current text at point of cursor - (0:filename), [F3] - save file to disk while in TEXT - will overwrite existing file - (0:filename),

Commands in BASIC..

CLOSE, EOF, INPUT$, INPUT#, KILL, LFILES, LINEINPUT#, LOAD, LOADM, MERGE, NAME, OPEN, PRINT#, PRINT#USING, RUN, RUNM, SAVE, SAVEM,

TS-DOS is my choice for disk access to the Tandy Portable Disk Drive. It's fast, dependable, convenient and feature-rich. The ROM version is my choice when I am not using another ROM. TS-DOS is available from Club 100. TS-DOS ROM $49.95. TS-DOS Disk $39.95

Order TS-DOS...

Include the following information when ordering TS-DOS: 1) ROM or Disk, 2) computer model (M100/102, M200, NEC8201), and 3) disk drive model (TPDD 100K, TPDD2 200K). Calif res add 7% tax. $3 ship. Visa, Master Card, Money Order, Check. Club 100, P.O. Box 23438, Pleasant Hill, CA 94523 - (415) 932-8856, 937-5039 fax, or 939-1246 bbs.

A Tribute to Traveling Software's LAPDOS II

A Product Review
by Richard Hanson
Founder, Club 100

No other program impacted the use of the Model 100 as much as Lapdos. Developed by Traveling Software back in the mid 80s, Lapdos helped make Traveling Software the worlds leading 3rd party support vendor in the Tandy laptop marketplace. Lapdos was orginally developed to transfer files between a Tandy Portable Disk Drive (TPDD) and an IBM PC or compatible computer.

Upon receiving Lapdos, one simply connected their TPDD to the COM port of their PC, via an adaptor, and ran the LAP.EXE program. The users screen would split vertically, showing the PC's files of the currently logged drive on the left, and the contents of the disk in the TPDD on the right. The bottom of the screen displayed a simple menu.

The Lapdos menu...

Help Log View Copy Wildcopy Format Erase Rename Goto Xchange Setup Quit

Using this simple menu Lapdos users control all aspects of file movement between their PC and their TPDD--at 19200 baud.

Within a few years, Lapdos became Lapdos II, version 1.42, where it stays today. The "II" version did all that the original version did, and more. The additional features included a TSR option, allowing the user to run Lapdos II in the background and pop it up at will, and nicer internal operations. The biggest change was an expensive, multi-headed cable and a program called LOADER. LOADER and the new cable allowed the user to connect their laptop (Model 100, 102, 200 or NEC PC8201A) or a TPDD, or the new TPDD2, directly to their PC. LOADER pumps a program called LAPDOS.BA into the laptop, which, when run, emulates the TPDD. Thus, LAP.EXE, running the PC, looks at the laptop as a TPDD--simple--well executed.

So much has been said about Lapdos yet too few laptop computer owners know its power. Informed sources reveal that there are over 1.5 million Model 100, 102, 200 and NEC PC8201A computers still in use today. Estimates make it that less than 1/10th of these owners own Lapdos. Yet, over 1/2 of these folks use DOS machines, as well as their beloved laptop. Similar figures cover Macintosh / Model 100 users, but that's a different story for a different time--except to say that Traveling once had a similar, quality, easy to use, and powerful program called Macdos II, which was upgraded by its original author, Scott Anderson, Pres., Cabochon, Inc., and is now called 100duet; sold by Club 100, of course.

Due to changes in the computer marketplace in 1989, Traveling Software discontinued their laptop support product line. Lapdos was gone. The year, 1989 was called the "dark ages" in Model 100 history. We [Club 100] were determined to improve this dismal situation. Thus, after several months of negotiations, Traveling Software's president and founder, Mark Eppley, granted Club 100 the exclusive rights to revive their product line--including Lapdos. And the Model 100 "renaissance" was born--it was March, 1990.

March was a special month for us at Club 100. We revived the Traveling Software product line, starting in March, 1990. Thus, it is fitting to pay tribute to both Traveling Software, and Lapdos II. Indeed, with a joy in our hearts and a smile on our face we offer a BIG, WET, WARM THANK YOU to Mark Eppley, and the whole gang at Traveling Software, for the honor and privilege they granted us, and thus the opportunity they afford all our members. So, with our glasses raised high at our March 9th meeting, we offer this toast: "To Traveling Software... to Mark Eppley... viva LAPDOS!"

Order Lapdos II...

Lapdos is just $39.95. You will need a Computer<-->Link cable to physically connect the two computers, just $17.50.

Include the following information when ordering Lapdos II:

1) PC disk size, either 5.25 or 3.5

2) Computer<-->Link cable COM port size, either 25 pin or 9 pin

Calif res add 7% tax. Include $3 ea item for shipping. Please call if you have any questions. Visa, Master Card, Money Order, Check. Club 100, P.O. Box 23438, Pleasant Hill, CA 94523 -(415) 932-8856, 937-5039 fax, or 939-1246 bbs.

used to simulate high-level control structures such as *WHILE ... DO, REPEAT ... UNTIL, LOOP ... EXIT ... END_LOOP,* and *FOR ... DO.* The *BASIC FOR ... NEXT* contains components of all these structures, but does not completely implement any of them (because of the convention that a *FOR ... NEXT* always executes the body of the loop at least once, despite the state of the starting and ending expressions).

Use the *FOR ... NEXT* in those contexts where it is appropriate, but don't force it to do a job it wasn't meant for; well-documented, properly indented and clearly isolated loops built with *GOTO*'s can be nearly as readable as the equivalent high-level language structure in the same context.

Rules 9-11 (Modules, subroutine design, and reusable code) Agreed. The major problem with modular design in standard *BASIC* is that there is no provision for parameters or local variables in subroutines. Because all variables are global, it is extremely difficult to debug two independent modules and not have unexpected variable interactions occur between them.

One feature provided by *VBASIC* is the ability to use include files. In this way, a file containing a (debugged) module is included in whatever new program requires it, without having to worry about interactions among line numbers (thus eliminating the need for rule 11).

Rule 12 (Flowchart, flowchart, flowchart!) I would rewrite this as: Structured design, structured design, structured design! It has been years since I've seen an old-style flowchart, but the sentiment is correct: a properly designed program, using top-down structured decomposition of the modules, is always cleaner and easier to maintain and to debug than a program that "just grew."

When this technique is coupled with the information-hiding and data-abstraction capabilities of modern languages, programs take on an elegance that is absolutely astounding. While *BASIC* is severely restricted by comparison, use of the proper design techniques is always to be encouraged.

Unfortunately, as Mr. Heiser correctly states, the mere presence of a tool is no guarantee that it will be used properly. (How many chisels have ever been used as screwdrivers?) I fully expect to see, and am resigned to seeing, programs published in *VBASIC* that misuse the language constructs in ways that I never anticipated, with no thought given to careful program design or the techniques of software engineering developed in computer science departments and laboratories over the past thirty or so years.

There is no substitute for education, experience, and the diligent practice required to maintain a moderate level of skill (particularly in a discipline such as computer programming that is as much high art as science).

After a doctorate in computer science, nearly twenty years of immersion in computing practices (ten of those spent concurrently teaching undergraduate programming), and constant reading in the attempt to keep from falling behind too fast, I know that I will never know enough or be skilled enough to satisfy completely the voice in the back of my mind that asks,

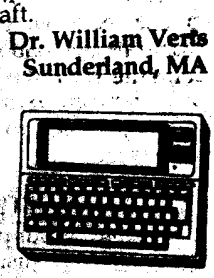
"Is this code the best I can make it?"

"Is this the most appropriate algorithm to use, and, if not, has anyone created a better one I don't know about?"

"Did I explain that problem to the students to their satisfaction?"

If I'm lucky, I can spend the rest of my life practicing my craft.

Dr. William Verts
Sunderland, MA



COMPATIBILITY: **Tandy 100 and 102 computers.**

Multiplan Comes Back!

The original Microsoft spreadsheet program for the Tandy 100/102 returns to the market.

by Terry Kepner

For only $35 you can buy *Multiplan* from Robert Rice, which originally cost $149.95 when Tandy sold it. For a ROM program that takes no RAM to store and yet delivers such powerful spreadsheet abilities, that's quite a bargain.

By now, everyone has heard of spreadsheets, although not everyone knows what they are. So, I'll start with a brief definition: a spreadsheet is a collection of columns and rows. You usually see these when people prepare a budget: One column lists the various items, the second column lists the planned budget, the third column lists the actual money spent. How many rows a spreadsheet contains depends on the number of items in the budget.

Another example is a retail store where the first column lists items for sale, the second their wholesale cost, the third their retail price, the fourth the difference between the first two, the fifth the number on hand, and so forth. At the bottom are totals of the money the store has invested.

A major feature of electronic spreadsheets is their ability to play What If...? In a matter of seconds you can find out what an increase of one percent in your suppliers' prices would mean to your bottom line profit, and how increasing your prices the same amount might increase your profit more than you expect.

Before they were put on computers, spreadsheets were a real problem. People always made mathmatical errors. Computers, on the other hand, do not make those errors, so it was only natural that they be used to create and maintain spreadsheets.

GETTING STARTED

Multiplan is simple to install in your Tandy 100/102: just remove the option ROM cover on the bottom of your computer, unwrap the chip from its protective foil, and plug it in the slot. It fits only one way, so you can't install it wrong.

Once it's installed, using it is even easier: just enter *BASIC* and type *CALL 63012* and press ENTER. Presto! *Multiplan*'s copyright notice appears on your Tandy, and the program asks for the name of the file you want to create.

If you want, you can write a one-line *BASIC* program, *10 CALL 63012*, that starts the ROM chip, but I prefer to save that menu slot for more important files. I just wrote the *CALL* on an adhesive label and stuck it on the bottom of my computer, so I wouldn't forget it.

Like many Model 100/102 programs, *Multiplan* works only on files in RAM, so you can't use it with a file on disk or cassette (although you can store the files on both these items).

Using it is even easier: just enter *BASIC* and type *CALL 63012*

WORKING...

When you start a file, you get an empty display except for a set of numbers running from one to seven on the left and one to four across the top. This is the beginning of your spreadsheet.

ABS	Absolute value
AND	Gives True if all values in list are true
ATAN	Arctangent
AVERAGE	Calculates average of list
COLUMN	Returns number of column containing formula
COS	Cosine
COUNT	Number of values in list
EXP	Calculates e (2.7182818) to the power listed
FALSE	Returns logical false
IF	Logical If...Then...Else
INDEX	Value in specified cell x,y
INT	Gives integer of value
ISERROR	Returns true if an error ocurrs
ISNA	True if argument is Not Available
LN	Calculates natural logarithm
LOG	Calculates base 10 logarithm
LOOKUP	Searches a table of cells
MAX	Finds largest number in a list
MIN	Finds smallest number in a list
MOD	Gives the remainder of a divide
NA	Gives the value of the cell containing #N/A (Not Available)
NOT	Returns the opposite of a logical argument
NPV	Net Present Value
OR	Gives True if any value in list is true
PI	3.14159265369898
ROUND	Rounds to precision specified
ROW	Returns number of Row containing formula
SIGN	Returns sign of argument
SIN	Sine
SQRT	Square Root
STDEV	Standard Deviation
SUM	Returns sum of a list
TAN	Tangent
TRUE	Returns logical value true

Table 1. Mathmatical functions

Pressing the *LABEL* key gets a list of possible operations: *Edit* (for editing the information in a cell), *Blnk* (setting a cell to blank), *Copy*, *Form* (setting the format for either one cell or the cell widths for the entire sreadsheet), *Name* (naming a cell or group of cells for use in formulas), *Opt* (toggles on/off recalculation and

SOFTWARE REVIEW

beep), *Tran* (for saving or loading files to/from cassette or disk, and in normal or SYLK format), and *Menu* (exit the spreadsheet).

Entering numbers and text is just a matter of moving the cursor to the cell you want, and starting typing. If the cell isn't wide enough, use the *FORM* key to make the cells wider (unlike other spreadsheets, you can't make one column wider or narrower than the rest). If you are entering dollar amounts, you can specify the number of decimals and if you want a dollar sign to appear. You can also center, left justify, or right justify the contents of the cell (number or text). These last five formats can be restricted to a single cell at a time, or can include a whole range of cells.

The real power of an electronic spreadsheet is its ability to manipulate the data you give it: its formula handling abilities. *Multiplan* supports the standard functions (see Tables 1 and 2). These let you do far more than just multiple rows and columns, they let you accomplish ninety percent of the work required in financial business. It will even let you test for Boolean logic (*IF THEN ELSE* type logic). The tutorial even shows (badly, unfortunately) how to use the *LOOKUP* command to examine a table of cells and determine the income tax owed on a salary.

Speaking of manuals, *Multiplan* comes with two: a reference manual and a tutorial. Both are small six by eight-inch spiral bound units in a slightly larger binder that holds the ROM chip and a sixteen-page six by 3.75-inch Quick Reference Guide. The tutorial does an adequate job of describing the program's abilities, but does fall down in providing good examples of specialized functions, as in the example I mentioned.

IN USE...

Once you understand the concepts of a spreadsheet and start to use one, they become addictive. I used one for a price comparison. Our grocery store lists the name of each item with its price on the register ticket. Saving them each week, I entered the items we usually bought into the spreadsheet. I discovered that prices are slowly creeping up, but some (like salmon) are dropping. What I also discovered was that each week we were spending close to twenty percent of our dollars on five percent of the items--junk food like potato chips, soda, pretzels. We changed our buying habits.

%	Percent operator
*	Multiplication operator
+	Addition operator
,	Union operator
-	Subtraction operator
/	Division operator
:	Range of cells operator
<>	Not equal to
<	Less than
<=	Less than or equal to
>	Greater than
>=	Greater than or equal to
^	Exponentiation operator

Table 2. Legal operators for formulas

Multiplan is not like most programs, and it uses memory differently. *Multiplan* doesn't need RAM when you are not using it, but it does need some when running--6,352 bytes to be exact. This cuts deeply into memory overhead. If you have other programs in memory, you may have to transfer them to disk or tape if you want to work with a large spreadsheet.

The data files set up by *Multiplan* also use memory differently. Every cell with a value in it (number, text, or formula) uses four bytes plus the bytes needed for the actual data. For example, typing a one into a cell uses twelve bytes: four for the cell, eight for the number. Typing "AB" uses six bytes. Also, every empty cell to the left and above the lowest and rightmost cell with data in it uses two bytes. So, if you go to cell location R10C10 (row ten, column ten) and type an "A", you just used 203 bytes of RAM. In addition, each spreadsheet immediately uses fifty bytes when you create it.

Multiplan has a maximum of sixty-three column and ninty-nine rows, for a total of 6,237 cells. You can't actually make a spreadsheet that big because of RAM limitations. Effective spreadsheet maximums are sixty three columns by thirty-eight rows, or ninty-nine rows by twenty-four columns (assuming all cells are used and you have 29K free in your computer). This still leaves plenty of room for the spreadsheets most homes and small businesses will build.

Once you make a spreadsheet, the problem comes of getting it on paper.

Alas, printing control is restricted to line length, and to printers that automatically line-feed with every carriage-return. Stock IBM-style printers will require a switch flipped or a special code sent to work properly with the Model 100/102.

If you have access to a desktop computer, you can always just save your spreadsheet in SYLK format and have the desktop produce the fancy hardcopy for you. (SYLK is a special spreadsheet format that lets them exchange files. Virtually all of *Multiplan*'s features are available in modern spreadsheets. Going the other way, from the desktop to the laptop, probably won't work because of all the additional features not supported by this version of *Multiplan*.

IN SUMMARY

Multiplan is an inexpensive, powerful program on a ROM chip. It's convenient, and works well. For $35 you won't find a better Tandy 100/102 spreadsheet.

PRODUCT SPECIFICATIONS & SUPPLIERS

Robert Rice
P.O. Box 53798
Houston, TX 77052-3798

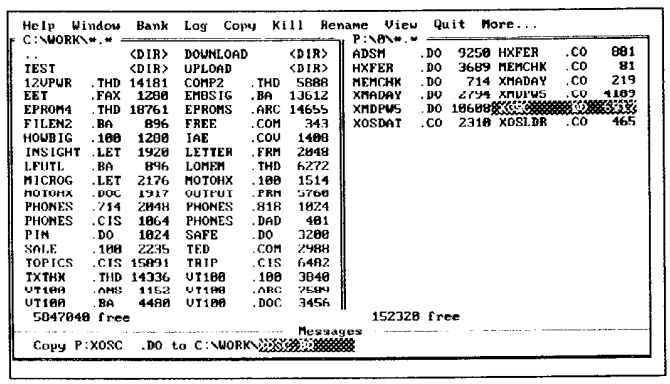
Multiplan—$35
A spreadsheet program for the Tandy 100 and 102 laptop computers.
Can read and write files in SYLK format for exchange with spreadsheet programs

Connect Your PDD to Your IBM

MicroMime has released PC-PDD, a Tandy Portable Disk Drive (PDD) to IBM PC (or compatible) connection. WP-2 users as well as Model 100/102/200 users now have a means of transferring files to and from their PC's. And PC-PDD takes care of all the file translations for you "on the fly."

With PC-PDD, you can: Copy files from the PDD to the PC, and vice versa; Translate files automatically to/from DOS; Have two-bank support for PDD-2 (except WP-2); Format PDD disks; Have a "point-and-shoot" interface; Browse DOS and PDD files; Edit DOS files; Jump to DOS, and return; and much more.

You need an IBM PC or 100-percent compatible computer, a PC serial port capable of 19,200 baud, 512K memory, PDD Model 1 (100K) or Model 2 (200 K), a gender changer (F-F), and a serial port adapter. PC-PDD lets you connect your PDD directly to the serial port of your IBM PC or compatible. The program features a split-screen display of your files on the PDD and your current DOS directory. Featured are an integrated file editor and browser. The browser even lets you view your file in both hex and ASCII modes simultaneously.



Price is $49.00 plus $3.00 S&H (CA residents add 6.25-percent sales tax). Gender changer may be ordered from MicroMime as well for $7.00 (specify 25- or 9-pin PC serial port).

For more information, contact MicroMime, P.O. Box 28181, Santa Ana, CA 92799 (714)545-1765. *Or circle #61 on your Reader Service Card.*

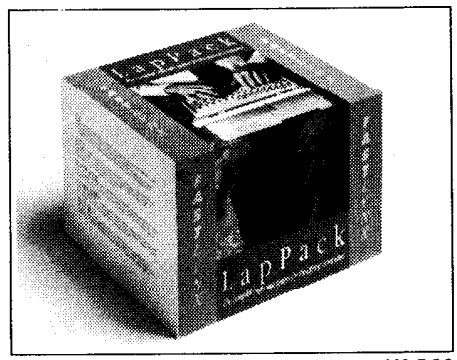
FastLynx LapPack: 10 Programs in One Package

Rupp Corporation, developer of the FastLynx file transfer utility software program, has introduced FastLynx LapPack, ten laptop-oriented programs in one package.

Easy to use, laptop-oriented PC-compatible software programs from seven leading software companies—worth a combined retail value of $1,049.00—are featured at a list price of less than $300.00 in the FastLynx LapPack.

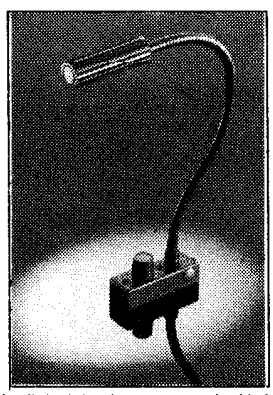
Included in the FastLynx LapPack are several Rupp products, including: FastLynx, the file transfer program; FastLock, a hard disk locking utility; the MergeIt! Phonelist, a portable telephone list utility; and FastJuice, a new battery gauge for laptops. Also included in the package are Switch-It, a time-saving utility from Better Software Technology; the MS-DOS Software Pack from CompuServe; the Maximizer contact management software from Richmond Technologies & Software, Inc.; EZC Smart Cursor from Seaside Software; the Sitback automated hard disk backup program from Sitback Technologies, Inc.; and CO/Session from Triton Technologies, Inc., a remote control communications software product.

Suggested retail price of FastLynx LapPack is $299.95. For more information, contact Rupp Corporation, 835 Madison Avenue, New York, NY 10021 (212)517-7775. *Or circle #62 on your Reader Service Card.*



Rupp Corporation's FastLynx LapPack *is ten MS-DOS laptop programs in one box.*

Littlelite High-Intensity Lamp for Computer Use



Shine light right where you want it with the Littlite.

The new high-intensity Littlelite gooseneck worklamp from CAE, INC. is designed for task lighting. Utilizing an efficient halogen bulb, the L-3 Series lamp produces an extremely crisp "white" light that is perfect for computer applications.

The extra-flexible shaft allows you to shine light exactly where you need it. The hooded design makes the Littlite great for use at your computer work station by providing light for your keyboard, desk top, and printer while keeping glare off your screen.

Littlites are available in 6-, 12-, and 18-inch lengths. The L-3 set comes complete and ready to mount including its own power supply and base with full-range dimmer. With several mounting accessories available you can easily mount your Littlite high-intensity lamp anywhere you need it.

For more information, contact CAE, INC., P.O. Box 430, Hamburg, MI 48139. *Or circle #65 on your Reader Service Card.*

Model 100 & 200 Software

Genuine Tandy brand software is again available for the Model 100, 102 & 200 laptop computers. Due to a special purchase, Robert Rice is able to offer this software to Portable 100 readers at special prices.

Model 100 software in stock includes Microsoft's Multiplan spreadsheet in ROM. This full-featured spreadsheet is flexible, powerful and easy to use. Model 100 Multiplan files can be transferred to another personal computer and used with almost any other spreadsheet program.

The Multisolutions ROM for the Model 200 includes a very useful and flexible appointment calendar, database management and word processing enhancements. The database program and word processing programs are closely linked to make the production of form letters an easy task. This one ROM will meet the computing needs of most Model 200 users.

Romulus Chess is offered on tape for the Model 200. This challenging chess game supports a very well done graphic display of the chess board. Several levels of play are offered.

The Model 200 Technical Reference Manual is also available. This handbook features detailed technical information concerning the Model 200 and the inner workings of its hardware and system software.

Robert Rice offers a no-nonsense guarantee: If you don't like it, send it back for a full refund of your purchase price. Send for a catalog with descriptions and prices. For more information, contact Robert Rice, P.O. Box 53798, Houston TX 77052-3798. *Or circle #60 on your Reader Service Card.*

COMPATIBILITY: WP-2

Getting it on Paper: WP-2 Printer Setup

"If it's not on paper, it doesn't exist."
—I.R.S.

by Stan Wong

The biggest obstacle to professional writing today is the necessity for changing a typewriter ribbon.
—Robert Benchley

Unlike other "wordprocessors," the WP-2 doesn't have a printer mechanism built in. As I've discussed before, I think that this is a big advantage. And no typewriter ribbons to change, either! Unfortunately, you do have to have a computer printer, and to integrate it with the WP-2.

Different computer printers do much the same job: print text. Beyond that, they are all different and follow only a few loosely defined "standards." The WP-2 is flexible enough to handle most printers, but you do have to tell it some of your printer's characteristics.

This is the start of a multi-part discussion about getting your words onto paper. At least four factors affect getting your words into black-and-white. First, you have to set up your printer. Second, is the layout of the page—for example, what kind of margins you want. Third, you have to decide on how you want your text to appear. And last are the editing commands you use when creating and editing your text.

A fifth item might be *what* you write, but the WP-2 can't help you there. In the computer profession we have an expression, GIGO, or garbage in, garbage out. The WP-2 can't help you write any better but it can help make what you write *look* better.

PRINTER SETUP

Printer setup can have two different definitions. To the WP-2 it means specifying the characteristics of your printer in the WP-2. It can also mean setting up the printer itself. If you already have your printer connected to another machine, chances are that you don't need to do any of the latter setting up of the printer. You may, however, have to set up the printer on the WP-2.

Now let's put on our hip boots. We're about to wade through a morass of computerese. But once you've got it set up, you'll never have to do it again unless you get a different printer.

To reach the setup menu, hold down the *F2* key and press the hyphen (-). A small submenu appears on the right of the screen. Your choices are:

F2-S System
F2-T Telcom
F2-P Printer

At least four factors affect getting your words into black-and-white.

Press *F2-P* or use the down arrow to position the highlight bar over the *Printer* selection; then press the *ENTER* key. You'll see this screen:

Printer		:	Tandy IBM
Boldface	ON	:	1B 45
	OFF	:	1B 46
Underline	ON	:	1B 2D 01
	OFF	:	1B 2D 00
Other	ON	:	
	OFF	:	
Newline		:	CR CRLF

Here you'll specify your printer's characteristics. You'll probably need to use only two of the settings (boldface and underline), but I'll explain what the other items are. In a later column I'll delve into using these options creatively.

Through the *Printer* selection you tell the WP-2 if you have a Tandy printer or an IBM-compatible printer. Unless your printer has the Tandy brand printed on its side, select *IBM*.

The next three selections specify different *fonts*, or typestyles. These are the printer codes to turn certain text formatting features on or off. Almost everyone can use the default values. These are the "universal" IBM/Epson printer *escape sequences*.

JAIL BREAK

An escape sequence is not a prison inmate-initiated action, or a fighter pilot getting ready to "punch out."

To us computer nerds, an escape sequence is a series of characters that the printer interprets as instructions telling it to do something, rather than as text to be printed. And how does your printer know what is to be printed or not? Through the escape character. The escape character (ESC) never prints on paper; instead, the printer uses it as a signal to tell it that the characters that follow are instructions, such as to print in boldface or to change from pica to elite type. These instructions that start with escape characters are called *escape codes*.

The American Standard Code for Information Exchange (ASCII) looks at characters in two important ways; how the characters are described (such as ESC) or show on paper (such as *E*), and the numeric value of the character, often important for a precise description of what is sent to the printer. The escape

character is defined as part of the ASCII code set as having a value of 27, or 1B in the computer's hexadecimal (base 16) number system.

So the computer literature represents the escape codes in different ways. Some use the form *ESC-E* where the *E* represents the ASCII letter *E*. Inside the WP-2, the letter *E* by convention is represented by the number 69, or 45 in hexadecimal (hex).

An alternate way, which I use here, is to use the hexadecimal number directly. So *ESC-E* becomes *ESC-45*. I prefer this since the printer setup menu deals with hex numbers. If your printer manual uses the letter convention, you'll have to find an ASCII chart to make the conversion. Every printer manual that I've seen has one in the back pages somewhere.

Epson/IBM printers have defined *ESC-45* to be the code to turn the boldface feature on. *ESC-46* turns the feature off. So whenever you specify text in the word processor to be printed in boldface type, the WP-2 automatically sends out the specified codes when it sends the text to the printer.

Escape sequences can be of variable length because the printer interprets the code on the fly. The underline code deserves a mention since it is a three-character escape sequence. The first character is the escape character itself, of course. The second character (2D, or 45 in decimal) represents the code for the underline *mode*, where the printer expects another character that tells it what to do about underlining. Once in this mode (after receiving 2D hex), the printer knows to expect one more character. This third character tells the printer to turn underlining on or off.

ON THE OTHER HAND

The next field on the printer setup menu includes the *Other* codes. They are blank, that is, undefined. You can use it to define a typestyle (such as italics) that your printer supports. If you do have an IBM/Epson-compatible printer, then the codes for italics are these:

Italics ON : 1B 34
Italics OFF : 1B 35

Last, the *Newline* selection lets you define how your printer handles the end of a line of text.

The end of a line of text sent to a printer is marked in the computer by a *carriage return* code. The term harks back to the days of manual typewriters when there was a real carriage to return. The typewriter combines two physical motions into one. When you slap the return lever on a typewriter, your hand and arm supply the left-to-right motion, returning the carriage to the right margin so you can start typing the next line. In computer terms this is the *carriage return*.

YOU SAY TOMATO ...

The second part of physical motion in a manual typewriter includes a ratchet that advances the platen to the next line. In computer parlance this motion is a *line feed*.

Computers use the *CR* character (13 decimal, D hexadecimal) and the *LF* character (10 decimal, A hexadecimal) to represent the typewriter carriage return and linefeed motions, respectively.

Now, to muddy the waters even more, computers mark the end of a line of text in two different ways. Some systems mark it with only a *CR* character. Most DOS systems use the duo, the *CR* and *LF* characters. Unix systems use only the *LF* character. The WP-2 uses only a *CR* character to terminate a line.

I SAY TOMAHTOE

The issue is further clouded by the variation in printers. Some, like Tandy printers, add a LF to every CR, assuming that the computer uses CR's only. However, most printers assume that if you want to advance to the next line you'll send it a LF character also. Many printers have DIP switches, which let you adjust its assumptions about whether a LF should be added after CR. It's usually best to leave the setting alone.

You can use it to define a typestyle, such as italics, that your printer supports.

For the WP-2 attached to an IBM-compatible printer the typical setting to the *Newline* setting is *CRLF*. If you have a Tandy printer the typical setting is *CR*.

You'll find out what setting you really need when you print a document. If your text is coming out double spaced then you need the *CR* setting. If your printer prints an entire document on one line without advancing the platen, then you need to add a LF by selecting the *CRLF* setting.

WINDING DOWN

At this point you've told your WP-2 about your printer characteristics. Now you have to connect your printer to the WP-2. If your printer is an IBM compatible, it's as simple as plugging one end of the printer cable into the printer and the other end into the WP-2.

Like many WP-2 users, and me, you may have a desktop computer as your primary computer. If so, you probably already have a printer hooked up to it. Rather than unplugging and plugging the printer cable to print a document, consider using a switch box instead. I described such a setup in the April issue (see p. 22).

Well, that's all for this month. I've covered setting up the WP-2 printer parameters so that it fits the printing capability of your printer. Next month I'll have more on getting your prose onto paper. The topic will be page layout, which covers such items as margins, headers, and footers. Until next time, don't forget to write!

by Stan Wong

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.*

USE YOUR DESKTOP COMPUTER AS A DISK DRIVE FOR YOUR M-100.

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GET IT FREE! Of all orders received between April 1, 1991 and June 1, 1991, one lucky person will have his or her full purchase price for this item refunded! ORDER TODAY!

Try *Disk+* for 30 days. If you aren't as excited as we are, return it for a full refund.

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 PCSG for $40).

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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Circle 73 on reader service card.

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COMPATIBILITY: Model 100, 102, and 200 (sometimes others, with changes).

PUZZL2.100

Take a break, tease your brain.

by Paul Globman

Here's a little puzzle that I have seen posed as a brain teaser somewhere... and indeed it is!

The rules are simple. The right arrow rotates the letters clockwise. The left arrow rotates the letters counterclockwise. The *ESC* key restarts the puzzle from the beginning. The down arrow reverses the four letters in the box.

You start with the letters alphabetized except for *A* and *B*, which are reversed. Your task is to reverse the *A* and *B* so all the letters are in order. The number in the upper right corner of the LCD counts "moves." A move is a reversal of the boxed letters. Left or right rotation is not counted as a move. Can you alphabetize the letters in 50 moves? How about 30 moves? How about 20 moves? Have fun!!

Paul can be reached by modem on CompuServe (72227,1661) and GEnie (P.GLOBMAN), or by mail at 9406 N.W. 48th St., Sunrise, FL 33351 (please enclose SASE if you're requesting a reply).

```
 0 REM PUZZL2.100  Copyright (c) 1989
 1 REM                by Paul Globman
 2 DIML(20):D$="BACDEFGHIJKLMNOPQRST"
 3 CLS:FORI=1TO20:READL(I):GOSUB17:NEXT
 4 FORI=0TO2:GOSUB15:NEXT
 5 FORI=1TO20:PRINT@L(I),MID$(D$,I,1)
 6 NEXT:PRINT@75,C:X$=INKEY$
 7 IFX$=CHR$(27)THENRUN
 8 IFX$=CHR$(29)THENGOSUB20
 9 IFX$=CHR$(28)THENGOSUB21
10 IFX$=CHR$(31)THENC=C+1:GOSUB22
11 GOTO5
12 DATA 54,57,60,63,66,109,151
13 DATA 231,269,266,263,260,257,254
14 DATA 251,248,206,126,88,51
15 LINE(76+I,I)-(150-I,22-I),1,B
16 RETURN
17 X1=((L(I)MOD40)*6)-3:X2=X1+10
18 Y1=((L(I)\40)*8)-4:Y2=Y1+14
19 LINE(X1,Y1)-(X2,Y2),1,B:RETURN
20 D$=MID$(D$+D$,2,20):RETURN
21 D$=MID$(D$+D$,20,20):RETURN
22 MID$(D$,1,4)=MID$(D$,4,1)+MID$(D$,3,1
)+MID$(D$,2,1)+MID$(D$,1,1):RETURN
```

End of listing.

Listing 1. PUZZL2.BA *for the Tandy laptop computers.*

COMPATIBILITY: All MS-DOS computers.

Of Calculators and Spreadsheets

George gives us a quick tour of DeskMate's *calculator and spreadsheet functions.*

by George Sherman

If any application is qualified to challenge word processing's position as "top dog" of the software market, that application has to be the electronic spreadsheet. Truth to tell, a lot of pundits believe there wouldn't be a thriving MS-DOS market if Lotus Corporation had not released the best selling PC program of all time, Lotus 1-2-3, *shortly after IBM announced its entry into the PC marketplace.*
—Jack Nimersheim

We will discuss *DeskMate*'s *Text* in a future article. However, for this one we will consider the next most used ability of your personal computer, number crunching.

Let me talk from personal experience.

My children and grandchildren tell me I grew up in the Dark Ages. For you of my readership who are unaware, that means before television. As a child I had no access to the wonders of the electronic revolution. When I did math, I did it in my head or with a paper and pencil. I could add fairly well and subtract with about equal ease. Multiplication, ehhhh. (Picture shoulders shrugged and fingers of right hand spread rocking from side to side.) Division? Forget it. Trying to find the square root of a number would reduce me to a shuddering pulp.

If you dug into the hidden recesses of my attic you would find my grammar school report cards, which showed that at least I was consistent. I always got the lowest possible grade in arithmetic, D's or F's, whichever meant "flunked!"

As an adult with several children I wasn't much better.

During one of my former lives I was an insurance salesman. While in this profession I was able to purchase a mechanical pocket adding machine. It was metallic and had numbered metal slides, which the user moved up or down with a metal stylus. With it, I could add and subtract. I used to dream of a little pocket-sized machine that could also multiply and divide.

OUT OF THE DARK AGES

When I saw my first pocket calculator, I was then employed by the U.S. government and routinely used desk calculators in my work. One of the problems with them, in addition to size, was that their use was limited to the length of their power cords. So I bought the pocket calculator immediately. It had four functions, add, subtract, and—glory be—multiply, and divide. It was bulky and a little large for a shirt pocket, but it worked.

Calculator *is a full function calculator with five math functions, four memory functions, plus three other operational functions.*

Since that time I have owned many calculators. I presently own four. Where the first one I purchased cost me almost $100, my last cost me $7.24. It adds, subtracts, multiplies, divides, does square roots, percentages, has four memory functions, and several other abilities. For not much more, were I so inclined, I could buy another which would compute circles around my old engineering slide rule, and far more accurately.

However, all of these abilities pale into insignificance when compared to an electronic spreadsheet. What the modern calculator is to my old pencil and paper, so is the spreadsheet to the average calculator. With it you can do forecasts, budgets, account sheets, amortizations.

DESKMATE'S CALCULATOR

But I get ahead of myself. Among the many features available with *DeskMate* are (pause for dramatic effect) both a calculator *and* a spreadsheet. The calculator is one of the *DeskMate* accessories. From anywhere within *DeskMate* or any of its programs the user simply presses *F10* to see the accessory menu, then picks *Calculator*, and presses *ENTER*. A window magically appears in the center of the screen, similar in size to the popular credit card-size calculators.

Calculator is a full function calculator with five math functions, four memory functions, plus three other operational functions. In addition, the calculator keeps a running account of your operations in a special box to the right of the main calculator display similar to the paper tape printouts generated by desktop calculators. Very handy in helping you to remember what you have done.

THE SPREADSHEET

I quoted Jack Nimersheim at the be-

ginning of this article as stating that the introduction of *Lotus 1-2-3* shortly after the introduction of IBM's PC produced the explosion in interest in MS-DOS that continues to this day. The precursor to *Lotus 1-2-3* was *VisiCalc*, the grandfather of all electronic spreadsheets. Till its appearance on the scene, computers were interesting, a nice hobby, and great for games. *VisiCalc* transformed computers into a truly productive tool.

Spreadsheets allow you to automate the most complex mathematical operations. The computations can be saved and reused later. What's even nicer is that you can make a *template* of your calculations, save it, and then recall it each time. Fill in the blanks and let it work for you.

A good example of this is contained in your *DeskMate* package. Call up *Worksheet* if you haven't deleted it from your desktop. Or else start it up by choosing it in the programs box. An even better suggestion is to create a window for *Worksheet* on your desktop by pressing *F7* to get the desktop menu and then selecting *Create*.

Whatever your choice, run *Worksheet* and load the sample file, *LOAN.WKS*. You should see a completed worksheet. The display is divided by a grid into rows (horizontally) and columns (vertically). Each little square or rectangle where a row and a column intersect is called a *cell* and has a distinctive address defined as R#C#, such as *R5C1* (row 5, column 1). The *R5C1* address should contain the word *Period*. You move around within the worksheet using the directional arrows.

Cell R1C2 contains the amount of the loan , *1000*, for which this worksheet display is computed. Let's try something. Move the cursor to *R1C2* and then type in a different number. Jack Nimersheim in his book suggests 5000, so let's try that. Type in *5000* and press *ENTER*.

Other than entering the figure nothing else happens. You must issue the command for the worksheet to calculate the new figure, or *CTRL-C*. Press *CTRL-C* (hold down *CTRL* and type C).

Whoa here! Instead of running the calculation, *Worksheet* presents you with an *Edit Input* dialogue box listing the current interest rate. But what it is really doing is asking you if you want to use the same interest rate or change it. To keep the current rate, press *ENTER* again.

Spreadsheets allow you to automate the most complex mathematical operations.

Worksheet next asks if you want to change the months. Again press *ENTER*. Now, like the magic it is, *Worksheet* recomputes all the cells based on the new loan amount.

I wish I had room here to go into more detail as to how spreadsheets are organized and formulas work. I will try to cover this in a later article in which I will discuss a *DeskMate* add-on called—pause again for effect—*Lotus 1-2-3* for *DeskMate*. Yes, this premium spreadsheet program is now available to users of *DeskMate*. Suffice it to say at this point that *Lotus 1-2-3* is to *Worksheet* what it itself was to the pocket calculator.

BY GEORGE!

NOTE: 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. 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.

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.)*

DEFUSR appears monthly to answer your questions about Tandy notebook computers.

Send your queries to: DEFUSR, PORTABLE 100, P.O. Box 428, Peterborough, NH 03458-0428. Please enclose a stamped, self-addressed envelope for our reply.

D/VI CABLING INFO

I have a Model 100 and Disk/Video Interface. I bought the D/VI's a few years ago from a liquidator, tore them apart, and used the drives with my Color Computer. About a year ago I bought this laptop, and now I would like to use the D/VI with my Model 100.

I didn't get any manuals or interface wires with my D/VI's. In the November 1990 edition of *Portable 100*, in INPUT/OUTPUT, there was an item on making up one of the interface cables. Could you tell me what cables I will need to hook the drives to the board inside the D/VI? Also, do I need a disk to initiate the D/VI once I have it hooked to the Model 100?

Thomas Schneider
Minneapolis, MN

The drives used standard 34-wire flat cables with 34-pin edge-card connectors. Unless you removed the cables from the cases (the cables are too short for use outside the case), they should still be there. If you did remove and use them, then you can replace them with standard cables from your CoCo.

The D/VI unit requires a DOS disk to work. The DOS disks were included with the manuals distributed with the units. National Parts might still have some manuals available. To find out, ask your local Radio Shack store manager to call them and ask if the manual for the 26-314 Disk/Video Interface is still available. If it is, he can order one for you. The manual includes all the instruction you need to get the unit operational, including pin-outs for the computer-to-D/VI cable.

-tk

M100-TO-T2810 HD

I have a new Tandy 2810 HD. I would like to have some help in doing a direct link via RS-232 between the 2810 and my M100. There appear to be three setup programs in *DeskMate*. One is from the *DeskMate* menu for basic stuff like switching between 16 and 8MHz clock speed. It doesn't seem to be involved. At the *F10* softkey, a setup option allows me to change the printer parallel port to an external drive. It also allows me to select COM ports 1-4. I believe these are the serial mouse port, the external modem port, and the two internal board ports. Changing these around doesn't seem to help me get a terminal connection. I would like to have a direct hookup. I need to know how to set the parameters in this setup program. There is also a "set" option in the *Telecom* program. The settings there are pretty straightforward.

Could you tell me what cables I will need to hook the drives to the board inside the D/VI?

What I don't seem to be getting is how to enable the printer port as a direct connection to the M100 RS-232. I have been doing a similar connection between the M100 and my Osborne OS-1 for years. I must admit I am a little confused about the *Telecom* commands. I guess that means that I have no future as a hacker. I suppose I could use the serial port, but I don't have that cable. And how would you connect an RS-232 to a 9-pin serial anyway? You can't do that, can you?

Chris Stewart
El Prado, NM

What we have here is a failure to communicate. It is impossible to establish a connection between the T2810 HD parallel port and the M100 RS-232C port. These are totally incompatible port devices, using completely different voltage levels and signals, as well as pin assignments.

Your problem is your experience with your Osborne. The Osborne did not use a parallel port to drive the printer; it used an RS-232C port. Thus, the one port could be used either to drive a printer or for serial communications direct to another computer or to a modem. You can't do this with the 2810 HD. The printer port is restricted to use as either a printer port or an external floppy disk drive port.

If you want to communicate to another computer via serial port, you must use the serial port. On the 2810 HD, that means using the DB-9 connector (which is also used as your mouse port). To do this you need three external pieces: a 9-pin to 25-pin converter connector, a null-modem connector device; and a standard RS-232C cable with the proper connector at either end. All three are available from Tandy.

Once you have the computers physically connected, go to your 2810 HD software. First, tell the computer which device number to call that port (typically, without an internal modem, it's COM1). Next, go into Telecom *and run setup to tell it to use COM1 as the port assignment (as opposed to using the internal modem, when you have it installed). Finally, go into terminal mode. Make sure your status line at the bottom of the screen says* Off-line.

On your Model 100, set your STAT

parameters to match those on the 2810 HD, go into Term *mode and start typing. What you type on the Model 100 should appear on the 2810, and vice versa.*

-tk

THE M100 B.O.S.S.

When I bought my Casio SF-8000 Digital Diary (B.O.S.S.), I also acquired the interface hardware and software that permits entry and exit with an IBM compatible. Unfortunately, I don't own such a PC and thus must depend on a friend or business associate each time I want to create a backup or printout.

Has anyone assembled the hardware or software that would permit a dump from an SF-8000 to an M100? With the passage of time I have stored an enormous amount of valuable information in my SF-8000 and an occasional printout is a must.

The SF-8000 software permits a dump directly to a serial printer. Unfortunately, I don't have one of those either! Consequently, a means of dumping to my Gemini 10X parallel printer would be just as good for my purposes as a connection to my M100.

Frank M. Tuttle
Short Hills, NJ

To the best of my knowledge, no one has developed a B.O.S.S.-to-M100 system.

The dump to serial does suggest a possibility, though. Look in your B.O.S.S. manual for the RS-232 specifications on printer output. Cable your M100 to the B.O.S.S. and go into TELCOM. *Set your* TELCOM STAT *to match those in the B.O.S.S. (baud rate, word length, etc.).*

Now try printing to your M100. If you are lucky, everything will just shoot straight on over.

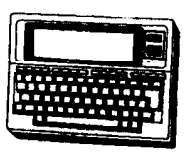
If you get only a character or two on the M100 display and then everything stops, the problem is that your B.O.S.S. is waiting for the printer to acknowledge receiving the characters it just sent before sending any more.

The solution is to change the cable by tying pins 6, 8, and 20 together (coming from the B.O.S.S.). This will fool it into thinking the printer (your M100) is always ready.

This won't work if the data transfer rate is higher than 1200 baud. The Model 100 loses characters if you go faster than that.

Let us know the results of your efforts so we can pass them on to others.

-tk



COMPATIBILITY: All MS-DOS computers.

Moving Up: Chapter Four

Setting up your own personal software base.

by Tony B. Anderson

The key to making the PC useful is to select software that does what you want a computer to do. If you're moving up from the Model 100 notebook computers, you probably want programs as simple as those with which you are already familiar.

In this column we'll be more concerned with selecting simple, Model 100-like programs to make using your PC a lot easier. These programs may have some additional features, but you can use them right away, without studying the manual for weeks.

With several programs available for each utility function you might need, you have only to locate them and take your pick. These articles are not going to describe every program available and detail the options or differences among similar utilities. Instead, I will present you with the easiest, simplest, most usable recommendation, and you can take it from there.

Next month, we start on the grand tour with a master menu program that makes selecting and running your programs as easy as the Model 100's main menu system.

Meanwhile, let's finish the introductory discussion on how to get these utility programs.

ROLLING YOUR OWN ...

Last month, we discussed programs to de-archive and unzip files or programs that you may download from bulletin boards (BBS's) or information service forums, or purchase from public domain and shareware (PD&S) program distributors. While there are also other formats for compressing files in use, the two programs described last month will probably handle 95 percent of your needs in dealing with public domain, downloadable, or shareware software.

To compress and archive your own files in these formats, you need programs that handle grouping files into one file and various kinds of file compression.

For the ARC archive format, developed by System Enhancement Associates, you need the complete version of the program, not just the de-arcing portion we described last month. The program is called *ARC*, and the current version seems to be 6.02. (It's sometimes hard to tell—since these programs are distributed via BBS's and shareware—if you have the "latest version" at any particular time.) It is available for downloading from many BBS's, and is available in some PD&S catalogues as *ARC602.EXE*. This version is on this month's shareware disk.

Gaining popularity is the self-extracting file.

For the ZIP format, a product of PKWare, you need *PKZIP.EXE*. The current version is 1.10, and it's downloadable from BBS's and available from PD&S catalogues. This version is also on this month's Shareware disk.

Two other formats you may run across, primarily on private BBS's, are PAK and ZOO. PAK is a product of NoGate Consulting and is gaining followers among the PC community. An independent comparison of file compression utilities has rated PAK first choice, overall, when comparing size, use and help functions, features, and documentation. Speed was somewhat slower than others, but it was still the top rated among the five utilities compared.

ZOO, on the other hand, was rated fifth among the five, with very low scores in all but speed—it's very fast. It's main attraction is that it is the only program supported by UNIX, VAX, Amiga DOS, and PC-DOS, but a review indicates the compression factor is poor as compared to the other techniques. ZOO is a product of Rahul Desi.

SELF-EXTRACTING FILES

Gaining great popularity among PC users is the self-extracting file, which comes to you as a single compressed file and may contain any number of compressed files or programs. A built-in decompressor program restores all the files to their original condition. Usually a self-extracting file comes to you as a single *.EXE* program, where you simply type the program's name and it unpacks itself into the original programs or files automatically.

While there are several such utilities, *LHARC* seems to be the most popular and is included in this month's shareware disk.

SAVING DISK SPACE

Another neat compression program shrinks your *.EXE* and *.COM* programs, saving disk space and giving you back some valuable hard-disk space if you're using a laptop with a hard disk. These utilities usually compress programs be-

tween 40 and 50 percent. After the program is compressed, a self-extracting program is added to it, so that when you run the program as you normally would, it automatically unpacks itself while it loads into RAM, where it runs normally.

Most *.COM* and *.EXE* programs can be packed, but some won't work well with this approach. For example, you should never try to pack your *COMMAND.COM* file. This file is the command interpreter for the computer and is a terminate-and-stay-resident (TSR) program that won't load or install properly if compressed. Also, you generally can't compress programs that use overlays, programs that come in several segments, usually identified with the file name extension *.OVL*. Each segment "overlays" the previous segment as it's loaded, so they use less RAM space in which to work. As for any others, you'll just have to try them and see if they run.

The compression program that does this neat little trick is called *PKLITE*, and it's freeware—that is, it's free to individual users for their own use. If you use the program in conjunction with a commercial venture, then you have to license it just like any other utility program. But the copyright owners will let you distribute packed programs for a very low royalty fee, with the advantage that, with the commercial version, once your program is packed it can't be unpacked by the consumer version. *PKLITE* is included on this month's shareware disk.

These are utilities that you'll likely need for downloading software from BBS's and other software databases. But before you start downloading software, you should evaluate what kinds of programs you really need.

These are utilities that you'll likely need.

YOUR SOFTWARE BASE

Think about your software base—the programs that probably account for the majority of your computer use.

Computers frequently perform a number of general applications. Word processing is one. Telecommunications is another. Database applications, spreadsheets, and desktop publishing are others, although desktop publishing can be considered an extension of word processing and machine utilities.

In the Model 100 family, the built-in (ROM) software consists of *BASIC* (a programming language), *TEXT* (word processing), *TELCOM* (telecommunications), *ADDRSS* and *SCHEDL* (database), and in the Tandy 200, *MSPLAN* (spreadsheet). Utilities—individual programs that do specific chores, such as word counters, sorting programs, and such—are generally handled as loadable programs (they run in RAM and can be loaded or changed at will). Optional ROM's can add more programs to this basic group.

One advantage of the PC is that you are not limited to the existing ROM programs. You can load programs that best suit your needs and can change programs from time to time as you find new and better programs, or as more recent versions become available.

In your PC, besides many choices of software for each of the above broad groups, thousands of special-interest programs perform dedicated or specific tasks, not counting the thousands of special-purpose programs used in fields such as business, medical and engineering. If you're interested in those types of programs, you'll have to find and evaluate them yourself. That's a project simply beyond the scope of this series.

There is one trap I'd like to point out.

MOVING UP

While most of us use computers to perform specific tasks and to do meaningful work, a portion of the computer community always seems to be buying the latest model on the market or the latest version of popular programs, who are always learning the intricate nuances of every new software package and feature, but who never manage to *use* all that stuff. You may know or work with people like that. They're the folks who never get any work done, but they are masters of the latest version or newest model, the techno-nerds of the industry.

But you don't have to use the full-blown word processing program with all the bells and whistles, or a desktop publishing program, to write simple letters and memos. You don't have to mount a major spreadsheet to add up a column of numbers, or construct a relational database system to keep track of a couple dozen phone numbers. It goes back to the concepts of simplicity and using the tool that does the job the best or the easiest—using the Model 100 mentality in the PC world. Sort of a Zen approach to computing. Some may call it resource management. Regardless, it's choosing the right tool for the right job. Michael Daigle's articles (THE IDEA BOX) often touch on the concept.

The Software Labs
3767 Overland Ave. #112
Los Angeles, CA 90034

Shareware Express
27601 Forbes Road, Suite 37
Laguna Niguel, CA 92677

California Freeware
1747 E. Ave. Q, #C-1
Palmdale, CA 93550

Figure 1. Public domain and shareware distributors who publish good-sized catalogues.

Your software base will consist of a handful of useful programs that you know well and which you can use to turn out meaningful work. It will include a selection of programs that fit under the above categories, and a number of programs specific to your use of the computer—to do what you need done.

SOFTWARE SOURCES

I get a lot of downloadable software from the IBM forums on CompuServe, and similar software is available on BBS's all over the country (see Figure 1 for a list of three PD&S distributors who distribute good-sized catalogues, and whom I've ordered from satisfactorily).

The Software Labs has perhaps the largest catalogue of programs in the country. California Freeware is not really *freeware* it's a mixture of public domain, freeware, and shareware, but that's the company name.

Power Up Software
P.O. Box 7600
San Mateo, CA 94403

Tiger Software
800 Douglas Entrance
Executive Tower, 7th Floor
Coral Gables, FL 33134

Figure 2. Commercial software businesses that also provide good, relatively low-cost, public-domain and shareware software, also with extensive catalogues.

Plus, see Figure 2 for two commercial software houses (with extensive catalogues) from whom I've purchased good, relatively low-cost software.

A REMINDER ...

I've received a number of letters (let's see, three is a number, isn't it?) asking for some advice relating to the Model 100 computers. Please note that my focus is on MS/PC-DOS software specifically for the Tandy laptop PC's. So you'd be better served by sending Model 100 questions to the DEFUSR column in this magazine.

(There really were more than three...)

Further, if you want a personal reply, you need to enclose a self-addressed and stamped envelope.

Also, not being a source for PC programs, I can't locate and send (or sell) copies of programs by request. Unless they're something I'll be writing about and offering on the shareware disks, I don't have them.

This month's shareware disk is number 3 in the series and includes the programs mentioned above. $6.00 postpaid. Write Tony Anderson, P.O. Box 60925, Reno NV 89506. Be sure to specify 3.5-inch or 5.25-inch format.

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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LUCID© is here now. It is on a ROM cartridge that snaps into the compartment on the back of your Model 100. It takes no memory to load and no memory for operating overhead. That means you have the full 29.6K bytes free to store your data.

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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Getting to know *TEXT*

Getting started with your Model T computer.

by Gene Wilburn

TEXT is to the Model T what pastrami is to a deli. For most users it's the reason for having a Model T in the first place. Tandy market research indicates that the majority of Model T owners use *TEXT* far more than any other Model T application.

The popularity of *TEXT* is easy to understand. *TEXT* produces plain-vanilla ASCII files that can be transferred easily and cleanly to other computer systems. In part, this accounts for the Model T's tremendous success among writers and journalists who feed files to their publishers.

TEXT is simple to use—surprisingly little training is required. If you can type, you already know most of what you need to know. And *TEXT*, along with the Model T's inherent portability, is what turns the Model T into a go-anywhere, ready-for-anything electronic notebook. It allows you to work in the "cracks" of your schedule. You can turn on the Model T, jot some notes in *TEXT*, turn it off, and resume whatever you were doing in the time it takes a standard PC to reach the C:\> prompt.

WHAT *TEXT* HAS

Compared with most text editors, *TEXT* is a lightweight, but it provides just enough features to be useful. One of its essential features is wordwrap. Wordwrap has become so universal that it is easy to forget how important it is to the flow of thought. It allows you to concentrate on typing without worrying about where you are on the line. Pressing a carriage return—the Model T *ENTER* key—terminates a paragraph. In older mainframe and mini text editors, wordwrap either did not exist or, as with Unix text editor *vi*, was provided as a cumbersome afterthought. Though a lowly-seeming feature, wordwrap is an essential ingredient in making *TEXT* more word-processorlike—hence better for writing.

Another important feature of *TEXT* is its ability to cut, copy, and paste text. The Model T's store everything you cut or copy in a special buffer that you can paste in elsewhere—even in another document. This allows you to rearrange text easily.

All the Model T's provide good cursor movement. You can move the cursor by the character, the line, a video page at a time, or to the top and bottom of a document. Check your manual for instructions. The Tandy 100, 102, and 200 units offer alternative cursor movement options based loosely on the *WordStar* cursor diamond. You may prefer this mode if you're a *WordStar* user.

Another useful feature of *TEXT* is its ability to search a document, locate words or phrases, and position the cursor at that spot. As we'll see later, this can form the basis of a text-management technique for working on longer documents.

TEXT can transfer files to and from a cassette recorder. A recorder is the least expensive way to store Model T files, though many users prefer disk drives for storage.

Last, but not least, *TEXT* allows you to embed control characters in a file by using the control (*CTRL*) key. For instance, you often start a control-key sequence using *CTRL-P*—that is, you hold down the *CTRL* key, press *P*, then release the *CTRL* key. This is usually abbreviated as ^*P*. Control-key sequences have many uses, such as allowing you to embed attributes like boldface, underscore, and italic into a *TEXT* document.

WHAT *TEXT* DOESN'T HAVE

One of the most noticeable absences from the *TEXT* feature list is search-and-replace. You can search for words or characters fine. But, for example, if you repeatedly have to replace one spelling of a word for another spelling, you have to do it manually. The advanced ROM's such as *Super ROM* and *Ultimate ROM II* add the search-and-replace capability to *TEXT*, but those are topics for a future column.

Another missing feature is word count. For writers and students, this is especially irritating. You're nearly always writing to a word count—e.g., "give me 1500 words on ZEV's (zero-emission vehicles) by Friday." You can come up with rough estimates based on the Model T character count, but it's just not the same. No wonder so many users have written their own word-counting programs in *BASIC*.

(*TEXT* has no thesaurus or spell-checking dictionary, but that's okay because Model T users never make misteaks, right?)

TEXT allows you to embed control characters in a file by using the control (_CTRL_) key.

POOR MAN'S OUTLINER

In order to use *TEXT* effectively as a writing tool, you need a strategy for working with its small display. Because you see far less of your text than you would on a PC or a Mac, you need some kind of imposed structure to allow you to move around your document in logical units.

Yes, we're talking about *outlines*, though not necessarily the kind you were taught in English class.

Let's face it, writing is hard work, but it's almost always easier and more effective if you get your thoughts organized before you start. This is true whether you're writing on a computer or on paper. Here's a technique for "topic outlining" I've been using for years on the Model T.

First, when I'm about to write, I use my Model T to organize the major points. I recently wrote a review of the Tektronix Phaser II PX color printer for *Computing Canada*. Here's what I typed at the beginning of my file:

- intro
- what is it?
- how is the color produced?
- what features does it have?
- how well does it work?
- what does it cost?
- what are its implications?
- where can I find out more about it?

The outline does not need to be complex, but it should keep your writing on track.

I leave this "map" at the top of my file during the entire writing process. I start writing the actual text after the outline. For each section of my text, I first copy the appropriate line from the outline, then cursor to the end of my file and paste the heading into place. I then cursor to the beginning of the line and change the - to a = sign, e.g. = *What does it cost?*.

(Check your manual on this. On the Tandy 100/102 you copy text by first pressing *F7*, select, highlighting what you want to copy with the cursor keys, and then pressing *F5*, copy, to put a copy of the text into the paste buffer.)

I then compose the paragraphs that go under each topic (usually skipping the *intro*, which I do last). When a topic is finished I repeat the process for the next topic. As I finish each topic, I return to the top and change the - sign to a + sign for each completed topic, e.g. + *what is it?* This serves as a simple reminder of which topics I've dealt with. Because I use the Model T intermittently, this simple notation helps me get back into sync with my writing when I've been away from it, sometimes for days at a time.

The = symbols play an important role. On the Model T you quickly reach the point where it's difficult to know just where you are in a story. By returning to the top of the file and pressing *F1* (on the Tandy models) and entering =, I can do a quick overview of any story I'm working on. Each time I come to a section header I press *F1* and *ENTER* again to go to the next section.

When a story is finished, I remove the outline from the beginning of the document, and search out all the section headers and delete them.

SLUGGISHNESS

As you may have already discovered, *TEXT* becomes sluggish as a story grows and you attempt to insert material into existing paragraphs. One workaround for this is to put a placemarker where you want to insert text (I use three equal signs: ===), go to the end of the file, and type your insertion there. The responsiveness of *TEXT* is always good at the end of the file. When you're finished, cut the insertion from the bottom (*F7, Select*, plus *F6, Cut*, on the Tandy), zip to the top, press *F1* and enter ===, or whatever you used to mark your place, to move to your insertion point. *PASTE* in your insertion and remove the placemarker. This takes longer to describe than to do.

ATTRIBUTES

If you're moving Model T files to a PC and want to embed text attributes, you can use the *CTRL-P* (^*P*) function of *TEXT* to embed *WordStar* attributes. Follow ^*P* by the control sequence that is appropriate. For instance *CTRL-B* (^*B*) is the *WordStar* attribute for boldface. To enter this on the Model T, you type ^*P*^*B* where you want boldface to begin and ^*P*^*B* where you want it to end. *WordStar* attributes always work in pairs.

The attribute pair for underlining is ^*P*^*S*. The pair for italic is ^*P*^*Y*. Even if you're not a *WordStar* user, most MS-DOS word processors can import a *WordStar* file and preserve your attributes. Not all word processors preserve everything, though, so you'll have to experiment. *WordPerfect*, for instance, throws away the italic attribute when you use the *Convert* program to convert the Model T file to *WordPerfect*. *Word for Windows*, on the other hand, imports the file directly (tell it you're using *WordStar 4.0*) and it preserves the *WordStar* attributes beautifully. Any version of *WordStar* works fine, natch.

Next month: Getting *TEXT* files to your PC or Mac.

You can communicate with Gene via CompuServe (his ID is 72435,732), through regular mail via the Portable 100 *magazine address, or direct: 91 Inglewood Drive, Mississauga, Ontario, Canada L5G 1X9. Please add sufficient postage if you mail to Canada and an international reply coupon when requesting a reply.*

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This is it! Your last opportunity to get *PICO Magazine* back issues, many with articles and columns directed at the Tandy 100/102, 200, NEC-8201, Olivetti M10, and Kyocera KC-85 computers.

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First five orders get a 37th issue, April 1987, included FREE! **Order now!** Just mail your check to: Portable Computing Int'l Corp, PICO Back Issues, P.O. Box 428, Peterborough, NH 03458. For faster service call 603-924-9455 and have your Visa, Mastercard, or Amex cards handy. Order TODAY, they might be GONE tomorrow! *Note: The italicized entries in each month below are Tandy 100/102 related articles.*

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, Super ROM, 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.

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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 interview, 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 [OUT] 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.

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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

SOFTWARE

TRANSFER.COM MS-DOS/Tandy Laptop $9.95 plus $1.00 shipping and handling (Min. $18 for MC or VISA orders; Calif. residents add 7% tax).

Easily transfers .DO files both ways between MS-DOS computers and your Model 100, 102, or 200 laptop. MS-DOS formatted 5.25-inch disk contains the transfer program, complete documentation and several unique files, including laptop programs not found anywhere. Write to: McBride Services, 984 Hawthorne Drive, Walnut Creek, CA 94596. Order phone number (415)939-5285. 1/92

Public Domain Programs for Tandy Model 100/102/200 computers. Wide variety: TEXT, PRINT, TELCOM, BUSINESS, GRAPHICS, DRIVES, UTILITIES, GAMES, MUSIC, PROGRAMMING, EDUCATION. 28 page listing ($5) refundable off your first program order. Club 100, Box 23438, Pleasant Hill, CA 94523 415/932-8856, bbs:939-1246. 1/92

HARDWARE

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

For Sale: Model 100/102/200 Computers. Ever changing list of FSBO and consignment computers and accessories. Club 100, Box 23438, Pleasant Hill, CA 94523 415/932-8856, bbs:939-1246. 1/92

Tandy 102 w/32K, adapter, & null modem. Rarely used. $225.00 (409) 935-5637 5/91

FOR SALE

Run a BBS from your Model 100! For details, send $3.00 to Keith Graham, P.O. Box 6065, Omaha, NE 68106. 5/90

M100 w/32K and Ultimate ROM II. TTXpress portable printer - $350. negotiable. Call (802) 292-9406 evenings.6/91

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Model 100 (good condition), Super ROM, Ultrascreen, accessories. Will sell as package or separately. Best offer. John (617)662-2879. 5/91

T100-32K with Video/Disk Interface, acoustic coupler, recorder, software. Package only $595. EC. Dominic, 215-339-5848 6/91

WANTED

Hobby contact wanted with Tandy notebook users in Paris and suburbs. Possible program exchange. Speak English, French, and Model 100 assembly language. Call 45-03-12-16 Paris phone, or write Mike Kelton, 39 Avenue Paul Doumer, 75116 Paris, France. 4/91

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ROM WITH A VIEW

Continued from page 3.

Have you written MS-DOS programs that might be useful to others? Special useful batch files? *BASIC* programs or utilities? Tell us about them, please. (Note: Programs written to run on both Model T and DOS machines have a better chance of being being published.)

Incidentally, Model T programs often run with only minor changes on DOS laptops, like Sean Dwyer's *DENALT.BA* in this issue. Though we try to publish compatibility information above each article, we don't always have time to check 'em out. So before you decide a program won't work for you, try it. It just might! We plan to run articles on how to convert programs between Model T and DOS.

Let's welcome Optical Data Systems back to our pages. They have some very fine bar code products for Model T and MS-DOS computers. We reviewed Optical's Model 100 *BAR+* software in the July '89 issue, and we'll investigate their MS-DOS line soon.

Remember to look for R. Andrew Rathbone's upcoming article in *CompuServe* magazine (August '91 issue?) about the Model 100 family of computers. We're eager to see ourselves, our history, and our machines in such a large-circulation publication. Thanks, Andy!

Nuge

ADVERTISER'S INDEX

Free Information

For free information on products advertised in this issue of Portable 100, locate the Reader Service number corresponding to the advertisement that interests you. Circle the number on the Reader Service Card at page 23 (or on the protective mailing wrapper if you are a subscriber) and drop it into the mail. The literature you've requested will be forwarded to you without any obligation. Please allow 3-5 weeks for delivery.

TO SUCCEED IN THE 90'S, YOU'LL NEED THE RIGHT CONNECTIONS.

WPduet is now available from Radio Shack. Catalog #900-0723.

WPduet

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.

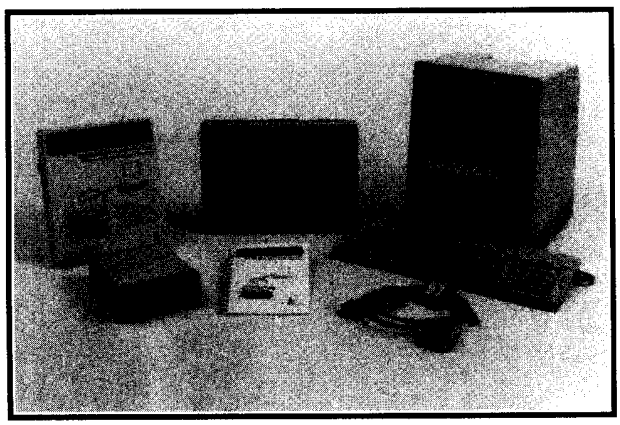
WPduet comes with everything you need to use the WP-2 with your Macintosh: a high quality molded cable, file transfer and conversion software, and complete documentation.

"*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, February 1991

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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To order, send a check or money order for $99.95 (plus $3 s/h) for each unit to Cabochon. (Mass. residents add 5% sales tax.) Purchase orders are welcome. FAX your PO for faster service. Please be sure to include the name and telephone number of your purchasing agent on each PO. Most orders are shipped within 24 hours of receipt. Standard shipping is First Class Priority Mail. Volume discounts are available.

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.

† 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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The four best programs for the Model 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 ... surpassed our highest expectations for 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.

Database: This is a relational data base like no other. You can do everything from mailing lists to invoices. No complicated pseudo-coding, you create input screens as simply as typing into TEXT. You are not limited by size; you can have as large an input screen as you wish. Prints out reports or forms, getting information from as many files as you like. Complete math between fields. Total interface with Lucid worksheets.

Outliner: Does everything that Thinktank does on a PC but a whole lot better. Includes a Sort for your headlines. Lets you have headlines of up to 240 characters. Has cloning, hoisting and sideways scroll up to 250 characters. Like Lucid, this one sets a new standard for outliners. This is the way to plan and organize your projects.

Present Lucid and Write ROM owners can upgrade for $150. If you have both it's $125.

As usual PCSG sells the Super ROM on a thirty day guarantee. If for any reason you are not satisfied, simply return it for a full refund.

We are excited about this product. Super ROM gives the Model 100 the true power of a desktop. No other multi-program ROM has software that compares. But don't take our word for it. We invite you to make that comparison yourself. Priced at $199.95 on Snap-In ROM.

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