

TERRY KEPNER'S

portable 100

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A MONTHLY PUBLICATION (EXCEPT COMBINED JULY/AUGUST ISSUE)

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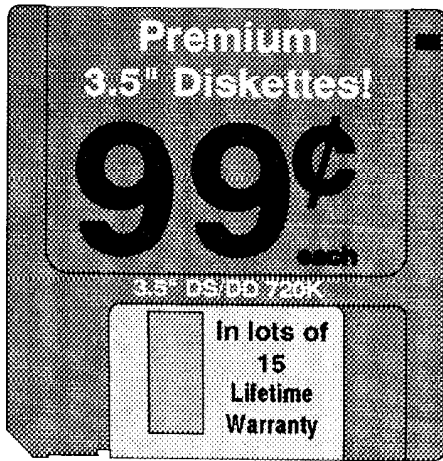
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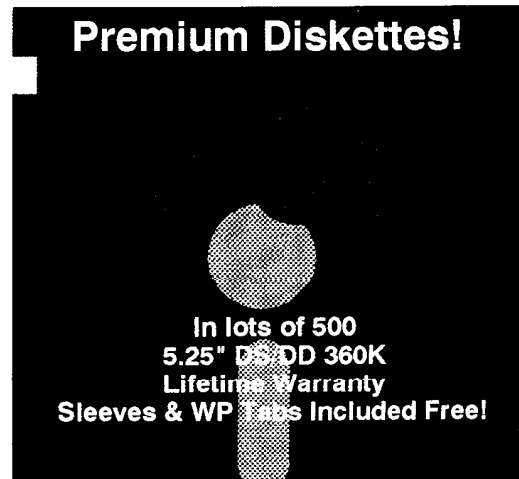
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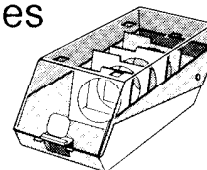
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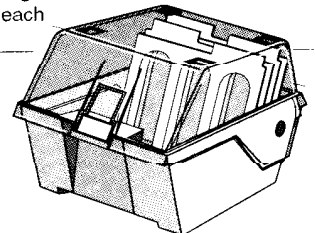
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Club 100: A Model 100 User Group

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TS-DOS ROM	M200	both	49.95
TS-DOS ROM	NEC	both	49.95
TS-DOS/RANDOM	100/102	TPDD	24.95

THE ULTIMATE ROM II

UR2	M100/102	89.95
UR2	M200	89.95
UR2	NEC	89.95

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M102	256K RAM Expansion	299.00
WP-2	128K RAM Expansion	79.00

PROGRAMS

Listing (refundable)	5.00
Hundreds of programs available on disk. The listing tells all...	
Drew Blanchar Collection	19.95
50 Great California Games	32.95

A WORD ABOUT ROMS

The Tandy Model 100, 102 and 200 computers have room for one option ROM. You must remove one ROM before using another ROM. This is actually quite easy, and several of our members use their laptop for different jobs at different times just by changing ROMs. Programs on ROM run from the ROM and thus do not use RAM. ROM programs offer surprising performance, and greatly expand laptop use. Club 100 offers 3 ROMs.

THE ULTIMATE ROM II

Contains 4 feature rich programs...

T-WORD - a print formatter; controls all printing options including margins, page breaks, headers, footers, page numbering, bold, underline, italic; includes a "pixel plot" mode that displays the way a page will look when printed.

T-BASE - relational database; control database development; control data input and reporting; links with T-Word for mail merge printing.

Idea! - thought outliner; create outlines and fill in the details; expand, contract and sort outlines as necessary to clarify thinking; useful for planning and scheduling.

ROM-View 80 - displays up to 60 characters per line while in T-Word, T-BASE, TELCOM and BASIC.

Extra: The UR11 ROM contains a link to TS-DOS, assuming you have TS-DOS on disk and a Tandy Portable Disk Drive (TPDD); works with both the 100K (TPDD) and 200K (TPDD2) formats.

ROM2/Cleuseau

Two major programming tools w/TEXT enhancements...
This is "THE" Model 100/102/200 programming tool !!!

ROM2: 8085 macro assembler, disassembler and debugger. Feature rich. Machine language programming experience required.

Cleuseau: Programming tools for BASIC; auto-numbering, renumber, pack, unpack and optimize, set break points, etc.

TEXT Enhancements: over write mode on/off, block modify upper/lower case, append to paste, search and replace, and more.

TS-DOS ROM

A true disk operating system (DOS) requiring NO RAM use...

Operates on both 100K and 200K Tandy Portable Disk Drives. Tag files for mass transfers. File compression. Print files from disk. Access your disk drive from within BASIC and TEXT. No pesky disk loading; simply call the ROM and you're working with your drive. Very fast!

HUMAN ASSISTANCE

10am to 2pm, Monday - Friday

Club 100 is a user group. There are no dues to belong. You are already a member, and thus, may benefit from our collective knowledge with a simple phone call. All questions respected, i.e., RAM expansion or disk drive? - which ROM is best for you? - how to transfer files to DOS and Mac computers? - sell or buy used equipment - how to recover from a cold start - how to access free software from our BBS - etc.

FREE INFO: Call or write for free information...

Club 100: A Model 100 User Group

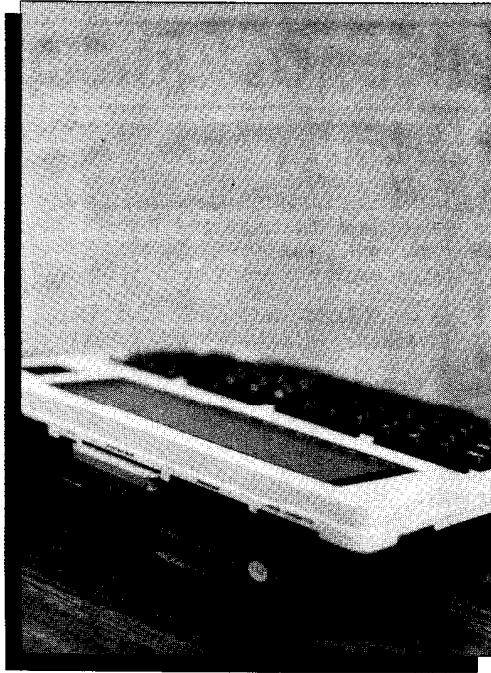
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Meetings: 2nd Sat/mo - Melo's Pizza, Pleasant Hill, CA - 12-4pm
California residents include 7.25% state sales tax.

Include \$2 per item shipping on all orders except program listing.



DATABASE MANAGEMENT WITH BOTH THE NODE RAMPAC AND DATAPAC

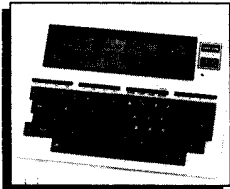
by Ron Alspaugh
*Owners of the Node memory devices, rejoice!
At last, there's a way to work with files
larger than 32K.*

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A FAX/MODEM FOR YOUR PORTABLE

by Terry Kepner
*Small, light, and fast! Send and receive
modem files and facsimiles.*

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Tandy 102

DESKMATE

by George Sherman
*A review of both the Deskmate graphical user interface,
and the book Getting the Most Out of Deskmate 3.*

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THE MANY PERSONALITIES OF EXTRAM

by Stan Wong
Use your Model 100, 102, or 200 option ROM socket for an extra bank of RAM!

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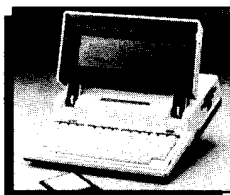


Tandy 200

MACHINE LANGUAGE FILE TRANSFER IN TELCOM

by James Yi
*This program converts machine language programs to a file format
that works with TELCOM on the Tandy 100, 102, and 200.*

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Tandy 600

PC STUDY BIBLE

by Terry Kepner
For the student of the Bible, this MS-DOS package is a must buy item!

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Club 600 and long-lived NiCd batteries.

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The Model 300!

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Tandy 1400LT

ROM WITH A VIEW

Back on schedule! You've probably noticed that the cover date on this issue, November, is a full six months ahead of the last issue you received, May. The explanation is simple: we wanted to catch up the issues so that the date on the issue matched the month you received the issue.

We had to do this because so many readers, and advertisers, were confused about their subscriptions, receiving the May issue and calling us wondering where the other issues were. New subscribers were also confused to receive a issue six months old as their first issue. So, to remove the confusion, we jumped the cover date.

We also jumped the expiration date of all the subscribers. This means that if your subscription expires in July of 1990, it now expires in November 1990 (this issue). If the expiration date after your name on your May 1990 issue mailing label reads 901228 (December 1990), then the new expiration date on this issue (November 1990) is 910528 (May, 1991). In other words, if you subscribed for one year (eleven issues), you *will* get the eleven issues you subscribed for, even though the dates on the issues make it seem as if your subscription is running for a year and a half. Two year and three year subscribers have had their expiration dates similarly increased.

OOPS, CABOCHON REVIEW UPDATE

Last month we ran a review Cabochon's *WPduet* for the *WP-2* wordprocessor from Tandy. I goofed in writing the sub-headline that titled the article. *WPduet* works only with the Macintosh line of computers, not the IBM and IBM-compatible computers, as that sub-headline indicates. I'm very sorry for any confusion this may have created.

Furthermore, Cabochon has recently told us that all registered users of *WPduet* have been sent a free software update that corrects the centering problem in Rich Text Format (Microsoft Word, etc.). So, if you have *WPduet*, make sure you have registered so you can get this free update.

A HELPING HAND

Make sure you tell your Tandy portable computer user friends about Portable 100. The more subscribers we have, the more advertisers we can get, the more support you'll have for your computer. We're doing our part to get new subscribers by mailing to new purchasers of Tandy portables, you can help by making sure everyone you know who owns a Tandy portable also is a subscriber. You can especially help us, and yourselves, by making sure that every Tandy store employee knows about Portable 100. And before you ask, yes, we do send Tandy stores a complimentary issue every month, but it seems that some store managers are just filing them instead of telling the store employees about us.

See ya'll next month!

Terry Kepner

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.

portable 100

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CLUB 600 STILL KICKING

Iwanted to take time to thank everyone again for the efforts that have gone into helping Club 600. We are still alive, but having to take things a little easier than before, due to a back injury.

I still receive mail from time to time from other new, as well as old, Model 600 laptop owners. I still have, and always will, help those who write. Although I have disconnected the Club 600 business line for now, anyone with Model 600 BASIC, pieces and parts, etc., should keep in contact with me, since I still have people looking for M600 items. I will reply in time, as I can only spend 30 minutes at a time at the keyboard. I only request that a SASE (large) be included to defray my costs in replying.

I'm working on an article or two about Model 600 programs, including a database application used by a Sheriff's deputy to track arrest warrants. As always, I'd like *Portable 100* to share them with other Model 600 owners, as I feel that they need as many different approaches as possible. Maybe other Model 600 owners will share their applications with your readers, too.

Dennis C. Rogers
Easy Ware Products/Club 600
P.O. Box 218778
Houston, TX 77218-8778

WILL MY M100 LIVE?

My Model 100 was purchased in the summer of 1984. Are the internal NiCd batteries going to wear out? I rarely, if ever, use them, since I almost always use live alkaline batteries or house current. Do NiCd batteries wear out with age? Are they likely at some point to leak inside the computer? Where are they inside the computer, should one wish to inspect them? Could they be replaced?

I enjoy your magazine and have been a subscriber since August 1984. I have collected all the previous issues and am proud to own a complete set. I use the Model 100 all the time, and have written four books with it. It never breaks down; it can do anything I need to do, and has all the convenience of a very portable and simple-to-operate computer.

Nicholas Ayo
Notre Dame, IN

Not to worry, Nicholas, your M100's internal NiCd's will likely continue to work for a long time to come. In general, NiCd batteries do wear out after a given number of charge/discharge cycles, and they do develop a "memory" and can suffer from overcharging. Yet to this date, I don't know of a single documented case where the NiCd's have failed in any of the Tandy laptops, regardless of age. (Daniel Cohen, a value-added reseller of NEC notebook computers, has reported that some NEC's have experienced internal NiCd failure.)

The subject has been discussed on the on-line services, and even knowledgeable people are surprised that no NiCd-related problems have occurred thus far. In any case, if the internal NiCd's ever do wear out, they can be unsoldered (they're inside the machine) and replaced with new ones.

So go ahead and write another book!

-MN

Is there a way to use an old Tandy Portable Disk Drive on the new WP-2?

MORE NON-100 STUFF

I'd like to see more on the non-100 models, like the Kyocera KC-85, Tandy 200, and WP-2.

Also, is there a way to use an old Tandy Portable Disk Drive on the new WP-2?

T.C. Schultz
Vacaville, CA

Nope, the older Tandy PDD-1 (100K version) disk drive won't work with the WP-2, at least not until someone can develop software to do it. Currently only the newer PDD-2 (200K version) is compatible.

As for non-Model 100 coverage, the KC-85 and Tandy 200 are so similar to the Model 100 that most M100 programs will run on them, the most notable exceptions being programs that use PEEK, POKE, and CALL statements. Compatibility information listed above the titles of articles will tell you if the articles and/or programs apply as well to other computer models. When available, model-specific program modifications are published in or following the articles.

We've lined up a WP-2 columnist, but due to the nature of his job, he's not always available. Expect to see a regular WP-2 column soon.

-MN

IF ... THEN ... WOW ...

Wow! That's a really powerful technique that Paul Globman has discovered (GLOBAL PERSPECTIVES, May '90). I had abandoned converting my some of my spreadsheets to my *Super ROM*, because it was too tedious converting a lot of IF's to TBL's.

However, using Paul's technique, I converted a large PC spreadsheet template of about four printed pages (some 170-200 rows) to *Lucid*. The template is quite large, about 16K, I guess, but it runs even faster than my PC spreadsheet because of *Lucid's* smart recalculate feature.

This particular application means that I can make decisions in the field rather than bringing the data home, doing the analysis, and then communicating the results the next day. Thanks!

Stan Wong
MicroMime
Santa Ana, CA

PAYBACKS ARE GREAT!

Enclosed with this letter is a disk containing selected programs I typed in from *Portable 100*, from the March 1986, and September 1987 through July 1988 issues. Included are AGENDA, BOXNEW, CALC-I, CALNDR, CLKAD1, CLKAD2, CLOCK, COADRS, DTANTR, FCHECK, FRACTN, GAME, LENGTH, PRINTC, TICTAC, TUNE, WORD.

Even though I have exercised care in typing and proofreading, there are errors in some that are beyond my ability to debug. Some of these are inherent in the

Int/Ext's for Laptops/Desktops

programs as published. I have noted, in a file named *README.DO*, the issues and page number(s) of *Portable 100*, where I got the listings I used, plus any problems I encountered.

My purpose in this exercise is to provide copies of these programs

which can be placed on the *Portable 100* BBS. If this proves useful, I will attempt to do the same for some other programs published in *Portable 100* but not available on the BBS. Perhaps in this way I can say "thank you" for all the help I have received, both there and in the magazine.

Bill McWeeny
Dardanelle, AR

Wonderful, Bill! Our BBS sysop, Chris Courson, now has the files and is posting them to the download area. We'll swat any bugs the best we can. As always, interested parties can find the number and TELCOM stats for our Portable BBS in our masthead on page 3. Thanks from all of us at P100 and, I'm sure, from our BBS users!

-MN

HAPPY P100 "STUDENT"

This letter is to thank all the staff members at *Portable 100* for a very fine and informative computer magazine. I am an intermediate level, self-trained BASIC programmer. I have written five programs for work that save me many hours of time. Much of what I have learned about programming and how it can be put to use was derived from your magazine. Page for page, your magazine is worth much more to me than those big, heavy mags overloaded with advertisements. I guess one could say that what sets *Portable 100* apart from the others is that it's a teaching magazine, while the others serve only their advertisers. Thanks again, don't change a thing, and keep up the good work.

David Schehl
Fredericktown, OH

DIY D/VI CABLE

I broke one of the pins on my Disk/Video Interface (D/VI) cable. Tandy promptly sent me another one, but they wanted \$69 for it and didn't tell me at the time. It's a 40-pin flat wire socket to 40-pin DIP. I promptly called them and asked if the price was correct. Yes, 18 inches of ribbon and two sockets cost \$69. So I sent Tandy their part back.

But Digi-Key (1-800-344-4539) sell the

- ◆ **Internal & External hard drives** for all Laptops \$795, 5 1/4" External floppys \$235, 2400bd Pocket modems \$159, Internal modems: *Call!*, Printers, Carrying Cases, Accessories.
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(019) 032-0021 in Calif or for Tech Assistance
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Circle 27 on reader service card.

parts to fabricate the cable. I selected the wrong socket for the DIP I ordered, but by *veerrrry* carefully removing each pin and reversing the direction of offset, I was able to make the plug work properly for about \$15.

The 40-pin DIP with ribbon cable is part number A2PXG-40218G-ND. The other style of DIP (A4PXG-4018G-ND) is probably the correct one for the socket (ASC40 ND) and would eliminate the need to modify the socket connector. This socket doesn't have a polarizing key. That—and the price—are the difference between Digi-Key's and Tandy's. I also purchased the strain relief (ASSR40-ND), pull tab (ASPT40-ND), and snap-in

*That—and
the price—are the
difference between
Digi-Key's and
Tandy's.*

pull tab (APPT40-ND).

I ended up buying a second socket, because I broke the first one learning how to modify it. So maybe I spent \$25 altogether.

You don't usually print my letters. That's okay, but I thought you might want to know how to save \$50 and learn about DIP-to-socket modifications. I think I'll use the savings to stay with *Portable 100* for another year.

Chris Stewart
Las Vegas, NM

Data Acquisition and Control Products for TANDY'S M100/102

ADC - 812

8 channel, 12 bit Analog

to Digital Converter

***** new product !*****

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8 channel, 8 bit A/D;

8 bit input port; 8 bit D/A;

8 bit output port;

***** plus more !*****

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So. Royalton, VT 05068

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Circle 88 on reader service card.

MODULAR DUDE

Is it possible to upload to your BBS? If so, please send me instructions, Model 100 TELCOM status settings, and so forth.

I really liked the VBASIC program in your March 1990 issue. It worked for me the first shot. That was not normal for me. In fact, I used it to modify the enclosed bar code program. It would be still greater if you could use more than ten symbols. No complaints, though, I can live with modular programming.

I am looking forward to my next issues.

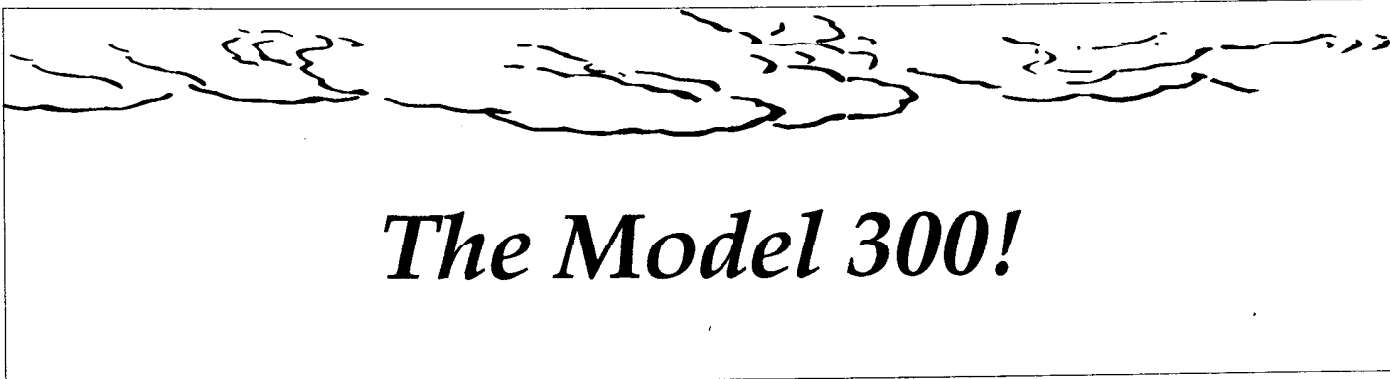
Frank J. Henze
Columbus, OH

Sure you can upload to the Portable 100 BBS. The phone number and TELCOM stats (8N1E) are listed in our masthead, near the bottom. For uploading procedures, your best bet is to log onto the BBS and check with the sysop, since we've just installed a newer, nicer version of the BBS software. There are also help files on the BBS to explain the various protocols, but Tandy notebook computers usually use plain ASCII for uploading and downloading. Xmodem programs are available for these machines, however, and you can download them from the BBS.

For the most basic instructions for getting onto the BBS, see my article, "GETTING WIRED" in the November 1988 issue.

-MN





The Model 300!

The time has come at long, long last, to turn our attention to the Model 300.

For those of you who missed it, a few months back I offered up my own unsolicited opinions of the then new Tandy WP-2 Wordprocessor and the 1100 FD laptop computer. Did I like them? Was I dazzled? Was I pretty sure that I couldn't live without them?

Well, actually ... no.

I won't bother to rehash old ground here. Suffice it to say that my disappointment was equally divided between what Tandy *did* do, and what they *didn't* do. And the most serious thing they didn't do was improve the Model 102.

I ended that column by asking readers to send in their own suggestions for what the next Model T computer should be. I dubbed this design exercise the "Model 300," and vowed to describe this dream machine, this composite of the best ideas of the bunch, in a future column. I also said I'd fax a copy of the column right into the offices of the heads of Tandy's computer division. And so I shall.

But before we begin, I have to tell you how sorry I am that I can't take the space

here to mention everyone who contributed their thoughts, time, and often considerable effort to this project. You've got a very loyal and involved bunch of computer users out there, Tandy, and if you continue to take their money and ignore their ideas and desires, shame on you.

So please believe me when I tell you that David Aikman, E. J. Masse, Greg L. Dasso, Rick Sparber, John M. Newbould, Paul A. Parks, the inexhaustible David O. Rowell, and the Model 100 SIG crew on CompuServe are but a tiny handful of the people who should be mentioned by name here. My thanks to *everyone* who contributed.

And now, ladies and gentlemen, boys and girls, humans and Republicans, I humbly present to you:

THE TANDY MODEL 300 NOTEBOOK COMPUTER

SIZE: The Model 300 is the same size and weight as the present Model 102. It seemed that very few people wanted the extra size and weight that a fold-up screen would add.

SOFTWARE: We've learned from the existing Model T's that Word Processing and Telecommunications are the two most important built-in applications for most people. The 300 should reflect that by making those applications stronger and more practical. Don't try to cover all the bases; many people will turn to after-

for "Letter to Mike Nugent re: Weasels In My Head." Longer filenames are a must. Also needed is a way to hold more than what is it, 24 files/applications in the machine? Subdirectories should provide a solution here.

DISPLAY: The 300 sports a variable-brightness backlit LCD screen. The backlighting can be switched completely off. The ROM has two character sets built in: a 40x8 set and an 80x16 set, switchable via the keyboard. Most folks also prefer the Model T's black-on-gray display to the newer dark blue-on-dark green displays. Finally, several people suggested an RCA port for driving an 80-column composite monochrome monitor. I couldn't agree more.

KEYBOARD: A consensus here—*everyone* seemed to love the present M102 feel. Many felt the numeric keypad overlay was superfluous, and *everyone* felt the cursor keys should be done in a full-sized, diamond-shaped pattern. Many people also suggested that the largely unused GRPH and CODE keys be tied to the F1-F8 keys, allowing 16 (or, used with the CTRL key, 32) user-defined, non-volatile macros to be stored.

MEMORY: Here was a surprise—most readers said 128K of RAM would be enough for them. Very few demanded more. Why? Read on ...

STORAGE: Ahh, here we go. You wouldn't believe the number of people who had the same great suggestion: an external, industry standard 3.5-inch, 720K disk drive that would read and write files in the *standard IBM format!* Great! Other ideas included battery-backed memory cards (like the Ultra-Card) and exotica like built-in 2-inch drives. Myself, I think the new Flash EPROM technology has incredible potential.

POWER: Almost everyone specified that the machine *must* run from conven-

*You can't always get what you want;
You can't always get what you want;
You can't always get what you want;
But if you try sometime,
You just might find
You get what you need...*

—The Rolling Stones

market ROM applications no matter what you do. But make those two areas good enough so that they don't *have* to unless they really *want* to.

For example, build formatting features into the word processor. Give it a simple pixel page preview feature (like T-Word, Write ROM, and others), and for cryin' out loud, give it a printer linefeed toggle! As for the TELCOM program: Xmodem protocol, direct downloads to and uploads from external storage devices, and the ability to view RAM filenames and sizes without quitting, would be very, very welcome improvements.

FILE MANAGEMENT: I *hate* trying to come up with a six letter abbreviation

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tional batteries. Many suggested that the machine also be able to charge (conventional) NiCd batteries in the computer itself. No one seemed to want to put up with the hassles that laptop owners have to contend with in their never ending struggle to keep their goofy non-standard, NiCd packs freshly charged. People want to be able to dive into a 7-11 store in an emergency, spend three bucks, and walk out with another two weeks of computing power. I'll certainly go along with that.

MODEM: Another consensus—everyone said the 300 *must* have a built in modem. Surprisingly, very few demanded 2400 baud; most seemed to feel that 1200 was fast enough. I'd prefer 2400 myself. The difference in cost between 1200 and 2400 is insignificant nowadays.

COMPATIBILITY: Another pleasant surprise. I expected a lot of people to demand MS-DOS compatibility, but noooooo... What everyone *did* want was Model T compatibility. Seems a lot of people have grown very fond of a lot of Model T programs over the years. Speaking of programs...

BASIC: Absolutely *must* be built in to the 300, according to most readers. And it's not just the power programmers, either. It's clear that even we common folk love being able to quickly kick out a

small program that does something as simple as, oh for instance, scroll the message "Connie Chung, be mine tonight!" a thousand times across the screen.

ALL THIS AND MORE: The list of improvements goes on and on and on.

The computer must run at 8 to 10 MHz, instead of the toad-like 2 MHz of the present Model T lineup.

People want more option ROM sockets built in; the number that came up most often was five. They also want folding prop legs built in. A gauge that displays remaining life on the batteries.

I thought the idea of the computer being built into a rugged and shock resistant hard rubber/plastic case was outstanding! I also like the thought of a Qwerty/Dvorak keyboard switch (ala the popular Apple IIc). Speaking of keys, how about setting some standards for developers, like asking them to *always* use the F1 key as the "Help" key?

Don't stop me now...

How about a built-in pop-up calculator? How hard can that be? And why can't we have a file transfer program (switchable between IBM and Mac) *built right in*?! Huh?! And what about this: fix it so that it will never, never, ever, COLD-START! And—ohmygod, what's that? A HANDLE??? YES!!! YES!!! YES!!!

(... and now, a brief interlude while our author has a cigarette and lets the sheen of perspiration dry from his heaving chest as his heart rate returns to normal...)

Sorry I got carried away—I was caught up in the moment. But I'm not the only one, am I? Admit it: you'd jump at the chance to own the Model 300, wouldn't you? You'd give Tandy several hundred dollars on the spot for one, wouldn't you? You'd even be willing to sit through a Dan Quayle speech ("How terrible a thing it is to lose one's lunch..."), sell your *Mad* magazine collection, and publicly renounce your undying lust for Connie Chung, wouldn't you?

I know I would.

But Tandy's got to give me the chance to prove it. Tandy's got to make it possible for me to abandon my beloved Model 102. And to do *that*, they've got to give me a new machine to jump to. *Not* another DOS box; I could get that from Toshiba or Sharp or Panasonic or so on and so on and so on. And *not* some quirky Cambridge/Sinclair knockoff: if the WP-2 is still selling 18 months from now, I'll kick my dog.

No, what I want—what THOUSANDS of us want—is the Model 300. How about it Tandy? Are you listening?

by Michael Daigle

COMPATIBILITY:

Tandy 100/102 and 200 computers with either the Node RAMPAC or the earlier Node DATAPAC.

Database Management With Both the Node RAMPAC & DATAPAC

*Tired of RAM file limitations? Here's how to use
the Node RAMPAC with files larger than 32K!*

by Ron Alspaugh

If you own one of the Node RAMPAC or DATAPAC add-on memory cartridges for the Tandy Model 100, 102, or 200, this article will delight you with its revelations about your memory storage device. The following describes a procedure to develop a BASIC program which uses an ISAM (indexed, sequential access method) for managing a very large database which is located entirely in the Node RAMPAC. The database is not managed by a file system or the Node software, RAMDSK.CO or option ROM, and is not limited by the amount of main memory available. The RAMPAC or DATAPAC can still be operated with its supplied software, the option ROM, or even Paul Globman's RAMDSK.CO.

When data can be organized into a fixed size record and consists of a number of pieces that are of the same type as in other records, then ISAM can be implemented to efficiently store, find, and retrieve information from a large database. Examples would be a name and address list, inventory data, customer information, etc.

The RAMPAC or DATAPAC can still be operated with its supplied software.

TERMINOLOGY AND INITIALIZATION

The following definitions apply to the program we are going to develop. A "field" is a value in a BASIC variable. The values of S\$, I%, X! or H# can be saved in fields, where field size will be LEN(S\$)+1, 2, 4, and 8 bytes respectively. A "record" has a fixed length of 1024 bytes and contains a predetermined number and "type" of fields. A "key field" is one or more predetermined field locations within a record that will be used to "index" or locate a particular record.

The Node RAMPAC is supplied with a program, RAMDSK.CO, which maintains a directory and provides file operations in the RAMPAC. The program that we will be developing does not use this software but can co-exist with your

RAMDSK file operations so that you do not have to give up this very useful function. To do so, however, we must first "reserve" a fixed amount of RAMPAC memory for the database application which will be taken away from the RAMDSK program and reflected in its space available status.

In addition, our BASIC program will need a machine language program which provides a low level GET and PUT function that passes values of its variables to and from the RAMPAC record. Listing 1 a BASIC initialization program

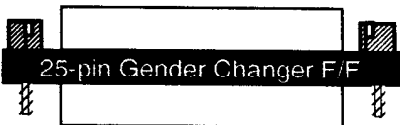
```

10 CLEAR 99,HIMEM-72
20 B=HIMEM : PRINT "PROGRAM ENTRY: ";B
30 FOR L=1 TO 6
40 READ C : GOSUB 200
50 READ A : GOSUB 100
60 NEXT : READ C : GOSUB 200
70 IF D<>7210 THEN PRINT"DATA ERROR":STOP
80 PRINT "INPUT NUMBER OF K BYTES TO RESERVE FOR"
81 INPUT"RAMDSK OPERATION (0-255):";K
82 POKE B,64 : POKE B+1,K
83 OUT 129,0 : IF K>255 THEN STOP
84 FOR I=0 TO 2*K+1 : N=INP(131) : NEXT
85 FOR I=1 TO 255-K
86 OUT 131,64 : OUT 131,0 : NEXT
90 STOP
100 D=D+A : A=A+HIMEM : J=INT(A/256)
110 POKE B,A-256*J : POKE B+1,J
120 B=B+2 : RETURN
200 D=D+C : FOR I=B TO B+C : READ J
210 D=D+J : POKE I,J : NEXT
220 B=I : RETURN
500 DATA 10,79,43,43,43,126,35,35,35
510 DATA 254,3,194,45, 2,121,183,202
520 DATA 36,15,219,131,119,71,35,62
530 DATA 167,95,119,35,62,246,87,119
540 DATA 120,242,43,12,126,35,94,35,86
550 DATA 211,131,213,225,71,121,183,202
560 DATA 60,5,219,131,119,35,5,194,51
570 DATA 6,201,126,35,211,131,5,194
580 DATA 60, 0,201
    
```

Listing 1. This BASIC initialization program lets your database co-exist peacefully with RAMDSK.CO and provides GET and PUT functions.

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which provides both operations. First, it prompts for the amount of memory needed for normal **RAMDSK.CO** (file) operations, then de-allocates the rest of up to 256K for this database program. Second, it loads a 72-byte machine language program starting at **HIMEM** and reduces **HIMEM** by 72, placing itself below **RAMDSK.CO** and any other routines in high memory. The program displays a value for **PROGRAM ENTRY**. Make a note of this value, as it will be used in the **BASIC** program that we will develop.

HOW A PROGRAM POSITIONS TO A RECORD

The **RAMPAC** has a built-in register which saves the current record pointer. This is hardware which is also used by **RAMDSK.CO** and is loaded by a **BASIC OUT** instruction. Our example program will have an instruction: **OUT 129, B+I**, which will set the desired value into this register. This number has the lowest value of **B**, which was saved during initialization to reserve lower records for **RAMDSK.CO** file operations.

HOW A PROGRAM GETS OR PUTS FIELDS

After successfully running the initialization program, your program may then call the entry point which is given by the loader program (you may want to write it down or just remember that it is at **HIMEM**). To **PUT** any **BASIC** variable into the current record position, simply perform the following call (where **X** is the program entry point):

CALL X,0,VARPTR(variable name)

The program can make subsequent **PUT** calls and the field pointer will automatically be positioned to the next location. If it is desired to restore the pointer back to the beginning, do another **OUT 129, B+I** to the record register, where **B+I** is the same value.

To **GET** a value into a **BASIC** variable, enter the following call:

CALL X,1,VARPTR(variable name)

Be sure that the variable name was previously defined in the program. Example: **S\$="" : H#=0 : T%=0** etc. Also, when "getting" a variable, its type **MUST** match that which was "put" in that field position. Example: If a record was saved with the variables **T% R# S\$ Q\$,** then after setting the record register you may "get" **A% B# C\$ D\$**. Note that the order of variable types are the same.

An important point when putting records is to insure that the total number of bytes of all fields does not exceed 1024. Your program must total all fields using the following amounts:

Strings: length + 1 byte
 Integers: 2 bytes
 Floating point: 4 bytes
 Double precision: 8 bytes

HOW A PROGRAM FINDS RECORDS

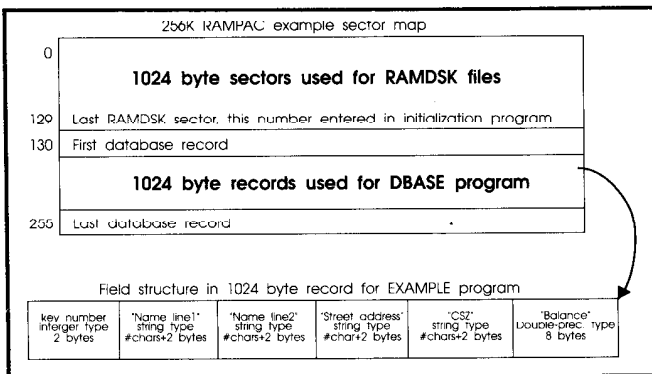
Your program must prompt the user for a key field, and it must know the position of that field within the record. It is useful to have the first field be an integer which indicates if it is a valid or "deleted" record. Once the key field is entered, the program simply searches all records for a field match. Remember, that if the desired field is **NOT** the first, you must **GET** the ones before the desired one, even if you do not need them. Also you **DO NOT** need to **GET** fields **AFTER** the desired one. You can design the matching criteria to be as complex as you wish, from matching only the first integer in a record to matching all or portions of all fields in the record.

Using the field structure in Figure 1 as an example, suppose that a record containing a desired zip code match is to be found. The zip code is known to be at the end of the fourth string field (which is the fifth field from the start of the record). The program must then, for all records, **GET dummy%,** then **dummy\$,** then **string\$,** and compare the last five characters of **string\$** with the desired **zipcode\$**.

PROGRAM EXAMPLE

The following sample program is useful as a guide for designing a more complex, functionally more useful program. Its field definitions and database functions can and should be expanded to suit your particular application.

DATABASE APPLICATIONS



The diagram in Figure 1 illustrates how the RAMPAC memory can be split into 129K for RAMDISK file operations and the rest, 126K, for our database program application. Also, a database record is shown with its fixed number and type of BASIC variable fields.

```
10 X=HIMEM:B=PEEK(X+70):IF PEEK(X+69)=6
4 GOTO 20
15 PRINT "NOT INITIALIZED - RUN DBINIT"
: STOP
```

If 64 is found at HIMEM+69 then the program assumes that the initialization program was successfully run, and it picks up the base RAMPAC sector number as the starting record number in B.

```
20 INPUT "<G>et, get<N>ext, <D>elete,
<P>ut: ";S$
30 IF S$="G" GOTO 200
40 IF S$="N" GOTO 230
50 IF S$="D" GOTO 300
60 IF S$="P" GOTO 400
70 STOP
```

The program has functions to find records starting at the beginning or at the next record position (*Next*), to delete records and, of course, to put in new records.

```
200 I=0 : J%=0 : INPUT "INPUT RECORD KE
Y: ";K%
210 OUT 129,B+I : CALL X,1,VARPTR(J%)
220 IF J%=K% GOTO 250
230 I=I+1 : IF B+I<255 GOTO 210
240 PRINT "END OF DATA" : GOTO 20
250 S$="" : FOR L=1 TO 4
260 CALL X,1,VARPTR(S$)
270 PRINT S$ : NEXT:H#=0
280 CALL X,1,VARPTR(H#)
290 PRINT "BALANCE=";H# : GOTO 20
```

This is code for the GET (line 200) and GET NEXT (line 230) functions. Line 200 prompts for a key field to match. Note also declaration of variable J% which will be used in a GET call. Line 210 has the OUT instruction to set record number then calls the GET routine. Line 220 has the key field matching criteria, which is simply having the first field being an integer equal to K%. Line

230 increments the record pointer and insures that it DOES NOT EXCEED 255 (for a 256K RAMPAC). Line 250 starts the section to GET and print four string fields. Line 280 GETs and prints the final field, which in this example is a double precision number.

```
300 OUT 129,B+I : J%=0
310 CALL X,0,VARPTR(J%)
320 PRINT "ECORD ";I;"DELETED.."
330 GOTO 20
```

This routine simply PUTs a 0 in the first field in the current record to signal the PUT RECORD routine that this record is available (has been deleted). You may not desire a delete function in your program. Line 300 rewrites the record register only to insure that the field pointer is reset to the first position.

```
400 I=0 : K%=0
410 OUT 129,B+I : CALL X,1,VARPTR(K%)
420 IF K%=0 GOTO 450
430 I=I+1 : IF B+I<255 GOTO 410
440 PRINT "DATABASE FULL..":GOTO 20
```

The first part of the PUT routine finds the first record that has a "deleted" code in the first integer field. A blank database must have these records initialized to 0 (zero) for this system to work. This example program uses this field for non-zero values as a kind of record code to facilitate future searches.

```
450 OUT 129,B+I : INPUT "KEY: ";K%
460 CALL X,0,VARPTR(K%) : L=1024 - 2 - 8
470 INPUT "LINE 1 NAME?";S$ : L=L-LEN(S$)
: IF L<0 GOTO 550
475 CALL X,0,VARPTR(S$)
480 INPUT "LINE 2 NAME?";S$ : L=L-LEN(S$)
: IF L<0 GOTO 550
485 CALL X,0,VARPTR(S$)
490 INPUT "STR ADDRESS?";S$ : L=L-LEN(S$)
: IF L<0 GOTO 550
495 CALL X,0,VARPTR(S$)
500 LINE INPUT " CSZ:";S$ : L=L-LEN(S$)
: IF L<0 GOTO 550
510 CALL X,0,VARPTR(S$)
520 INPUT "BALANCE (UP TO 14 DIGITS): ";
H#
530 CALL X,0,VARPTR(H#)
540 GOTO 20
550 PRINT "RECORD TOO LONG!!" : GOTO 300
```

Once a free record space has been found, the program prompts the user for each field entry and PUTs them into the current record. Note: the OUT 129,B+I has been repeated in order to reset the field pointer back to the beginning. Since string variables do not have a predictable storage length requirement, each entry length has to be tested with the amount of record free space remaining, in this case 1024 - 2 (integer) - 8 (double precision) - accrued string requirement.

If the record size has been exceeded, this program simply insures that it is deleted and returns to the main menu. Clearly, a more user-friendly approach can be taken, such as checking each field for a maximum length.

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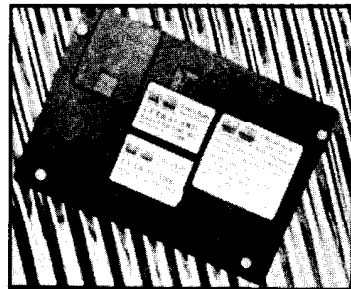
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EXPANDING PROGRAM FEATURES

The example program described provides a simple platform for expanding and customizing, as would be needed for any real application. We may want to have a separate program for database cross referencing and report writing, one different than that used for data entry. As an extreme example, an inventory database can produce reports for costing, allocation, purchasing lists (MRP), item location, vendors, etc.

Adding the capability to sort and total, or to automatically print selected fields, from keyed records in a specified format would be useful. One example would be a maillist, or labels, in zip code order, which are keyed by a field representing geographical location, interests, age etc.

Using 1024-byte records adapts to the RAMPAC hardware very easily as, like disk drives sectors, it can ONLY group data into this size. A database application, however, may need smaller or larger records to efficiently store its information. In this case we could fit an even multiple of records into one 1024-byte sector or, less likely, multiple sectors per record. To make smaller records, we need to replace the single statement *OUT 129,B+I* with a *GOSUB* routine. This routine would calculate the RAMPAC sector by dividing record number by records per sector, then position into the RAMPAC sector by the re-

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mainder number of records.

The following is an example of a record positioning routine which assumes four 256-byte records per sector and record number in *I*:

The use of this routine will reduce the program's perform-

```

OUT 129,B+INT(I/4)      'set hardware register to sector
Z = (I - 4*INT(I/4))*256 'calculate bytes of fractional sector
FOR X = 1 TO Z
Y = INP(131)           'port input to "dummy" positions
NEXT                   'RAMPAC sector pointer to record
RETURN

```

ance, because the *ONE* instruction *INP(131)* will be done 0, 256, 512 or 768 times each time a record is accessed. If the resulting performance is unsatisfactory, then the *FOR-NEXT* loop can be

implemented in a machine language *CALL* which can be added to the *GET-PUT* routine in the initialization program. This could be done in a future version if there is sufficient interest.

**To make smaller records,
replace the single statement
OUT 129,B+I
with a *GOSUB* routine.**

Ron Alspaugh owns Node Systems, maker of the popular Node RAMPAC and DATAPAC memory expansion products for Tandy notebook computers. Contact him at Node Systems, P.O. Box 1534,

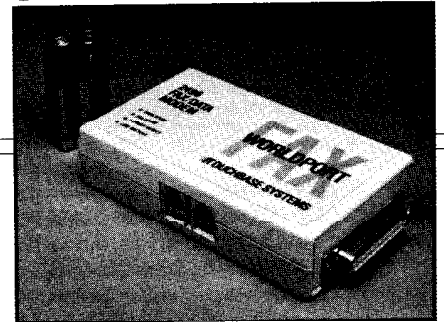
Grass Valley, CA 95945. Phone (916)477-9148—voice, (916)273-7519—fax.

COMPATIBILITY: All portable computers.

A Fax/Modem For Your Portable!

Only slightly larger than a pack of cigarettes, this battery-operable modem sends and receives faxes at high speed!

By Terry Kepner



If you've been waiting for a portable 2400 bps modem that includes 9600 bps facsimile capability (CCITT V.27, V.29), then wait no more—the Touchbase Systems Worldport 2496 Portable Fax/Data Modem is the one to buy. While pricey when compared with fax cards installable in a standard IBM, there's nothing to compare for the portable market.

The Worldport 2496 is a small, battery-operable unit that weighs less than six ounces, can fit in a shirt pocket, and yet can send and receive faxes from any Group III facsimile machine at 9600 bps as well as work like a regular 2400 bps modem.

MODEM IT!

As a modem, the Worldport 2496 is fully Hayes AT-command set compatible and operates at 2400 bps with automatic fallback to 1200 and 300 bps. Both American (Bell 103, 212A) and European (CCITT V.21, V.22, V.22bis) transmission standards are supported in the unit.

As a Hayes-compatible unit, the modem can be used as both a calling unit and an automatic-answer unit. I tested that last feature for several days by plugging it into the *Portable 100 BBS* at the office, where it functioned perfectly from the moment it was installed. (The previous modem had crashed and burned, and we used the Touchbase until a replacement could be purchased.) No special operations were required; I just plugged it into the BBS computer, plugged in the phone cable, plugged in the included power supply, and re-booted the machine. For the next week it answered all calls—2400 bps, 1200 bps and 300 bps—without complaint.

After we replaced it, I used it to test

the new modem, as well as download software from a bulletin board in Hawaii (I'm in New Hampshire). It worked perfectly with both the software Touchbase included in the package and with the other telecommunications software packages I used: *Telix*, *Bitcomm*, *Procomm*, and *Mirror* (the *Crosstalk* clone).

JUST THE FAX, MA'AM

Installing the included software (both 5.25" and 3.5" disks are supplied) itself was simple: Put the disk in the drive, run *INSTALL.BAT*, and follow the instructions. Unfortunately, this only works on machines equipped with a hard disk drive. Installing on a computer with only floppy drives is more difficult, and depends too much on the exact configuration of your computer to be executed as an automatic process.

In fact, if you have only a single-drive machine (such as the 1100 FD) you'll find that the software leaves you only 260K of free space on your 720K floppy. This is a problem in both modem and facsimile modes. The problems with the modem end are obvious: the space limitation on both downloading and uploading files. For the facsimile it is much worse: To send a file the software must first convert the file to usable form, increasing astronomically the space required for straight text files (graphic files are sent as-is).

For example, to send a copy of the *README* file, only 10K in length, required converting the file into six facsimile pages requiring a grand total of 146K (25K, 23K, 33K, 31K, 27K, and 7K).

Receiving text files is just as mind-boggling. A simple one-page fax required 43K of disk space—not a problem if you have two 720K disk drives or a hard drive, but a real problem for a single

drive machine.

The fax software is simple to use, although I did have a few problems at first. The software uses a menuing system to pop up different screens on your display as you select options. The main menu gives you six choices: *Fax*, *Data*, *Log/Queue*, *Utilities*, *Telephone Book*, and *Quit*. Subsequent menus offer more detailed options. All are easy to use and show consistent planning. It's only fault is in error reporting: The first fax I sent never made it to the other machine, although the phone rang and was answered by the other unit. There was no indication of a problem on my end. I only discovered the problem when I checked the other office and the fax wasn't there. A retransmission worked perfectly.

Files for transmission must be COMPLETELY in ASCII text. They must not be formatted in any way by your word processor, not even with tabs. I sent a letter and found that every tab at the beginning of each paragraph had been replaced by a small circle character. This is a problem, because most word processors DO NOT alter tabs to simple spaces when you save text files in ASCII or "unformatted" format. The only solution is to search and replace your tabs with the appropriate number of spaces.

One nice feature of the software is that it lets you chain files together when sending. You can send your custom logo/cover page followed by the files you want (with the option to make each file

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CRDFIL.BP: Unmounted EPROM which may be used in Traveling Software's BOOSTERPAK for the 100/102. **\$59.95**

CRDFIL.HEX: CRDFIL program code in Intel Hex format, which may be loaded from a PC (5.25 inch disk) into EME Systems extrAM storage device/ROM emulator, with software from their manual; for the 100/102 only: **\$49.95**

CRDFILEXT: CRDFIL program code in binary form, which may be loaded into the EME Systems extrAM from a Tandy Portable Disk Drive (1 or 2) using recently released R2D2X software (contact EME for software); for the 100/102 only: **\$49.95** Also available in a DVI compatible version on special order.

Sorry, but CRDFIL is not available for the Tandy 200, NEC, OLIVETTI or KYOTRONIC computers.

**T.A.F.T., P.O. Box 60925
Reno, NV 89506**

Circle 145 on reader service card.

start on a new page), including .PCX graphic files, without making separate phone calls.

The software is quite comprehensive, allowing background send and receive operations, manual operations, a telephone book of names and numbers to call, and remote/host BBS-style operation for others to call your computer and access files for modem and fax transmission (password protected) without interrupting you at your other work.

On the graphics end of things, I noticed that the software expands the graphic to fill the page. For example, the aforementioned Tandy 200 graphic was scanned into a .PCX file using a small 4-inch hand scanner. The transmitted fax page featured the graphic as an 8.25-inch wide by 9-inch tall piece.

The facsimile operation, as I mentioned earlier, is at 9600 bps. but it also falls back automatically to 7200, 4800, 2400, and 300 bps. It works with any Group III facsimile machine (most are).

THE HARDWARE

For use on the road where you may not have access to the wall phone plug, the Worldport 2496 includes acoustic operation. Acoustic cups for such use are not included, although an adapter cable

is supplied for the acoustic cups sold by Tandy (cat. #26-3805A or 26-3818 or equivalent). Thus, if you're on the road and find that you need the cups, they are available through any Tandy store.

MANUFACTURER'S SPECIFICATIONS

Touchbase Systems
160 Laurel Ave.
Northport, NY 11768
(516)261-0423

Worldport 2496

Fax/Data Modem—\$699

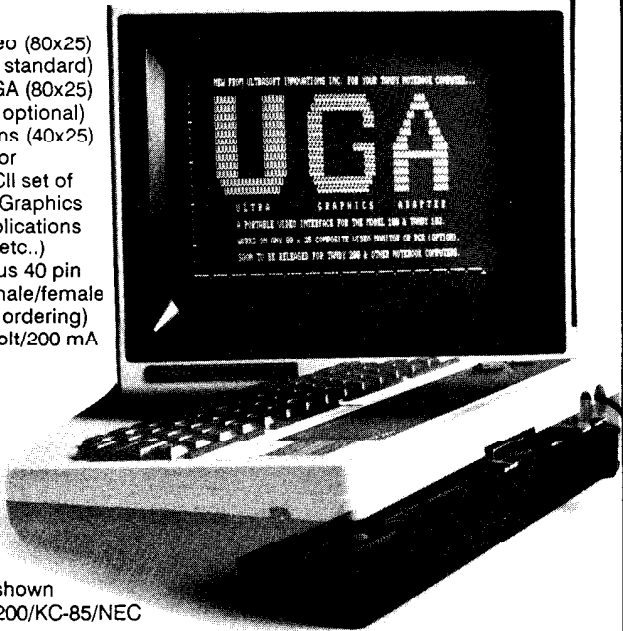
5.3 oz., 5"l x 2.75" w x 1" d
DB-25 female connector, 2 RJ-11C,
Power plug, Acoustic interface
plug & adapter cable, Power
supply & battery, 7 ft. tele-
phone cord, DB-25 male to DB-
9/DB-25 female cable con-
verter, Manuals & software

While the Worldport 2496 only needs a 9-volt battery to work, that gives you only three to four hours of operation. Because most people will use the unit somewhere near a wall socket, the Touchbase comes with a 9-volt power

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- Supports the full 255 ASCII set of characters including Int'l/Graphics
- Supports the 5 ROM applications (BASIC, TEXT, TELCOM, etc..)
- Data Interface: System bus 40 pin
- Data Connector: 40 pin male/female (specify 100 or 102 when ordering)
- Power Consumption: 6-volt/200 mA (AC Adapter included)
- Weight: 8 ounces
- Color: Black
- Dimensions: (LxWxH) 11.5" x 2.75" x 0.875"
- Software Driver:
 - 1.8K ram, relocatable (Specify cassette/disk)
- RS-232 interface unused
- Option ROM socket unused
- Monitor not included as shown
- Coming soon for Tandy 200/KC-85/NEC



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supply to help conserve the battery for those times when you really need it. To further conserve power, the unit has special power-down feature that turns the unit off when it is disconnected from the computer or when the computer is not actively using it. Thus, the battery is actually used only while you are transmitting or receiving information.

The Worldport 2496 has four LED's to provide information on what it is doing at any time. The first LED shows the modem operation, with solid ON indicating 2400 bps, flashing to announce 1200 bps, and OFF to show 300 bps. The second LED is for FAX operation—ON indicates 9600, flashing is 4800 bps, and OFF means no facsimile operation at all. The third LED is used for carrier detect, and the last LED comes on to indicate when your battery is low and needs replacement. If you are using the power supply instead of the battery, the first LED is always lit.

LAST WORDS

The modem works, the fax works, the software works (only with the Worldport, however), and it's portable. If you need both modem and facsimile capability on the road with your computer, try to fit this unit in your budget.

COMPATIBILITY:

All MS-DOS computers.

DeskMate

Here's a graphic user interface that works!

by George Sherman

During this series of articles we will explore *DeskMate* and several commercially available add-ons. *Q & A Write*, *Print Magic*, *Lotus Spreadsheet*, and *Memory Mate*. If you have ever used *DeskMate*, or are considering the move to a graphic user interface. I hope that this series will help you to consider the advantages offered by *DeskMate*, or help with your current decision to purchase and use *DeskMate*.

Before I get seriously involved in this project I have a confession to make. When I purchased my 1400 LT the purchase included a copy of *DeskMate* version 2.01. My first impressions were not enthusiastic. Oh, the windows were attractive and some of the features were interesting, but as a whole I thought the procedure was too cumbersome. Perhaps that is because I am a good touch typist. I did use the *FILER*, *ADDRESS*, and *CALENDAR* on an ongoing basis. Yet the rest of the programs and available features did not impress me, or were too complicated. Tandy's "clear" documentation did not do much to improve my opinion of *DeskMate*.

The first of the year, our editor, Mike Nugent, delivered a whole stack of *DeskMate* software to me and in his usual quiet, unassuming manner said, "Here. I need some 1400 LT reviews written, like yesterday."

Mike's attention then turned to other things, and I thought he had forgotten the *DeskMate* assignment. No such luck. In the mail arrived a copy of *Getting the Most Out of DeskMate 3* by Michael A. Banks. I found this book to be utterly fascinating. This book has made all the difference in understanding and getting the most out of *DeskMate*. With it I have come to a new understanding and appreciation for the graphic environment.

Also, I have customized my *DeskMate* disks to adequately represent my day-to-day interests.

My first impression of the new version 3.01 was good. The opening screen presents a window displaying the invitation, *Teach Me*. By choosing this feature, you are taken through a complete seminar on *DeskMate* and its various features. You are allowed to choose

**This book has
made all the
difference in
understanding and
getting the most
out of *DeskMate*.**

items in the order in which they interest you, to branch out to topics and subtopics, and generally do a considerable amount of exploring. Tandy has implemented a limited but rather good implementation of a hypertext help system. This is one of the nicer things Tandy has added to version 3.01.

My old standbys, *FILER*, *ADDRESS*, and *CALENDAR* are still there. *FILER* appears little changed from the prior versions. The *ADDRESS* display screen has been improved and, in my opinion,

is more readable. Otherwise, it works much the same as in previous releases. *CALENDAR*, on the other hand, has improved its date handling capabilities, which is one improvement I really appreciate. In the prior version, when asked to print, *CALENDAR* omitted the annual dates and printed only the current dates. It was a rather tedious process to work around this limitation, which required you to enter an erroneous action on each annual date to cause it to print. The new version 3.01 of *CALENDAR* prints EVERYTHING including the annual dates. Thank you, Tandy!

Since I do a lot of writing, both in personal correspondence and articles, *DeskMate Q&A Write* by Symantec Corporation, Cupertino, California, caught my attention immediately. I will dedicate an entire article to *Q&A Write* later in this series. For now, I will simply state that these articles are being written using *Q&A Write*. Each article, when finished, will also be spell checked by *Q&A*, which uses *DeskMate's* dictionary and related files, but adds some nice refinements to them.

Another interesting item is *Print Magic* by EPYX, Redwood City, California. This print program allows you to create cards, award, banners, etc. I used it to print up several banners, and also to create a very impressive letterhead for my correspondence.

I am now learning to use *Lotus Spreadsheet* by Lotus, Cambridge, Massachusetts, and *MemoryMate* by Broderbund, San Rafael, California.

With the help of *Getting the Most Out of DeskMate 3* I was able for the first time to understand *DeskMate* and the plethora of programs, files, and accessories which are included on the disks. I was also able to understand the various *DeskMate*

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commands which are waiting to be used if you know what they are. To quote Mr. Banks, "The *DeskMate* interface provides an operating environment and graphic interface for MS-DOS computers that is unsurpassed in combining ease of use with computing power." And, "In addition to providing a variety of applications, *DeskMate* is extremely flexible in terms of how you use it and how its screens are presented (which, of course, has more than a little effect on efficiency)."

DeskMate version 3.01 was delivered with four 3.5-inch diskettes. Since my operation consists of two floppy disk drives and no hard drive installation, I found the necessity of constantly swapping disks to be a hassle. Also, in my previous installation, only a diskette in drive A was necessary to kick start the program. The new version 3.01 requires a diskette in both drives A and B. Customizing your disks to include only those files relating to the various available programs you find most useful considerably decreases the hassle of swapping disks. Here again, *Getting the Most* was helpful in determining which programs and related files I needed to copy to my new "personalized" *DeskMate* disks. In my next article I will go more deeply into this personalization factor. For now, on with *DeskMate* as you will receive it ...

DeskMate can be run with or without a mouse. I do not presently own one of the little creatures, but I can see from what is available that using one would likely increase my enjoyment of *DeskMate*. Mouse drivers are provided for most of the various rodents available on the market and are selectable from the *Setup* menu.

In the event a mouse is not available,

drop-down windows are selectable by pressing the appropriate function keys. You can then make selections from the menus thus revealed in each window by pressing only the first letter of the item desired, or by using the "hot" keys indicated. Once you learn these "hot" keys, you can execute them from wherever you are, without first going to the win-

DeskMate can be run with or without a mouse.

dow. This really speeds up the process. Optionally, you can use a joystick with *DeskMate* in much the same manner as using a mouse.

Programs that are included with the *DeskMate* package include:

Address Book and *Phone List*. " *Address Book* consolidates all your address lists, organizes them into subsets at your command, and a whole lot more. *Phone*

List makes finding (and using) phone numbers a breeze ... *Phone List* will dial a telephone number for you, too (a modem is required)."

Calendar, *To Do*, *Alarm*, and *Month*. "Separately and together, these applications and accessories will keep your schedule on track, and remind you of important dates (they'll even remind you to check your schedule!)." I really use this program. Each month I print up a monthly calendar followed by all the dates, appointments, reminders and to-do's I have scheduled for that month. I hang this on the wall next to my phone as a constant reminder for both my wife and me.

Calculator. " *DeskMate's* calculator accessory is a five-function calculator with a fully addressable memory and a 15-digit display. Also, *Calculator* displays a running record of calculations via an on screen 'printout,' similar in size and appearance to a printing calculator's paper tape."

Clipboard "serves as a data-transfer tool ... (as well as) a place to temporarily store information 'clipped' (removed) or copied from various *DeskMate* applications."

Corkboard "is *DeskMate's* electronic analog of the ubiquitous "Post It" (tm) note pads—and is equally as useful ...

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necting it to Macintosh and IBM-com-
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you can even use it to make notes while
you're on-line with *Telecom!*"

Draw "is an application with which
you can create impressive drawings and
graphic designs for diverse applications
... *Draw* is easy to use; basic drawings are
assembled from basic shapes such as
straight lines, curves, circles, triangles,
etc., whose locations and dimensions
you specify. *Draw* also lets you resize,
move, rotate, and otherwise manipulate
or alter individual lines, segments of
drawings, or entire drawings."

Filer and *Form Setup* are my favorites
and most used of the basic *DeskMate*
package. "*Filer* stores information on
file-cards (forms) of your own design ...
Once information is entered in *Filer*, you
can sort, count, and search for records in
several ways. Or, you can print out se-
lected records or the entire database ...
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forms for *Filer* data entry, storage, and
display ... Being able to define your own
forms also helps you optimize data entry
and editing."

Telecom and *PC-Link*. "Although
they do not go hand-in-hand, the *Telecom*
and *PC-Link* applications are 'two of a
kind' in that they perform similar func-
tions. The differences between the two
are simply that one performs an array of
computer communications functions,

**You can even
use it to
make notes while
you're on-line
with Telecom!**

while the other is a very specialized and
efficient way to access a very special on-
line service."

Text, *Spell Checker*, and *Mailmerge*.
Basically, *Text* is the central cornerstone
of *DeskMate's* word processing system.
Spell Checker accessory checks the spell-
ing in a file on disk or in your current
document. *Mailmerge* is used by *Text* to
print form letters.

Worksheet "is an easy-to-use spread-
sheet program capable of handling al-
most any kind of 'number-crunching.'"

The *Task Switch*. Believe it or not, with
the *Task Switch*, "you can move from one
application to another without having to

USED TANDY SALE

MODEL 100—24 K	\$ 235.00
MODEL 100—32K	\$ 255.00
MODEL 102	\$ 295.00
MODEL 200	\$ 335.00
MODEL 600—24K	\$ 325.00
TANDY 1400LT—2 DR.	\$ 665.00
DISK/VIDEO INTERFACE	\$ 115.00
SHARP 4501 LAPTOP	\$ 400.00
DMP 105 PRINTER	\$ 55.00
BROTHER PORTABLE PRINTER	\$ 55.00

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save or otherwise disturb the file in use
by the current application." In other
words, *Task Switch* allows you to do
"multitasking with *DeskMate*." This,
then, becomes a very valuable program.

Setup. "The *Setup* accessory is a tool
for setting or changing *DeskMate's* oper-
ating parameters."

As you can see, there is much to know
and learn about *DeskMate*. More than I
can put into this preliminary article. In
future articles I will delve more deeply
into each item and give my impressions
and recommendations.

NOTE: Unless otherwise stated, all quotes
contained in this and future articles are from
the book, *Getting the Most Out of Desk-
Mate 3*, by Michael A. Banks, a "Brady"
book, published by Simon & Schuster, Inc.,
15 Columbus Circle, New York, NY 10023,
Copyright 1989 by Michael A. Banks.

BY GEORGE!

**MANUFACTURER'S
SPECIFICATIONS**

Tandy/Radio Shack
One Tandy Center
Ft. Worth TX, 76102

Getting The Most Out of Deskmate 3,
320 pages, Cat. #25-1254—\$19.95

Deskmate 3, Cat. #25-1351—\$99.95
Tandy's MS-DOS Graphical User
Interface for use with or without a
mouse. Includes basic word process-
ing, spell checking, mailmerge,
spreadsheet, calendar, calculator, ad-
dress book, drawing, filer, and tele-
communications programs.

COMPATIBILITY: Tandy 100, 102, 200.

The Many Personalities of extRAM

RAM for your Option ROM Socket!

by Stan Wong

Ladies and gentlemen (and you, too, Nuge—listen up)! Introducing the extRAM!

EME Systems, creator of the ROMBO (reviewed October 1989), brings us a multi talented marvel that defies a simple description. I call my unit "Sybil." Which should give you a clue to its versatility. (From the movie of the same name. Sybil's problem was her multiple personalities).

IDENTITY CRISIS

ExtRAM started life as the RAMBO, but EME decided to rename the product to extRAM. Why? Well, not even Tracy Allen, president of EME, is sure. I liked the RAMBO name since it was a nice complement to the ROMBO name.

ExtRAM, or RAMBO, is more than just a cute name, however. EME gives this description:

- 32 Kbyte memory expansion
- resides in option ROM socket
- 100% portable
- bank switched memory
- program-text-data archive, or RAM disk
- ROM emulator

Let's examine the verity of their description.

INSIDE EXTRAM

Wait! How can you write data to a ROM (Read-Only Memory) device? There aren't even any hardware "write" lines in the Option ROM socket. What's going on here? Well, the extRAM is basically a standard low-power 32Kx8 static RAM IC wrapped in a ROMBO Option ROM adapter. With a bit of additional circuitry, and two thin wires soldered to the ROMBO carrier, you have a RAM device in your ROM socket. On the Model 100 version the two wires plug into the system bus and tap into the

"memory write" circuitry. This enables you to write into the extRAM since the Option ROM socket was designed for reading data.

So their first and second claims are true.

VERSIONS OF EXTRAM

ExtRAM is available for the Model 100, 102 and 200. The parts appear to be essentially identical for all three models except the two wire connections.

On the Model 100 the wires plug into the system bus socket. For the Tandy 102 and 200 the wires plug into different wire adapters that are then attached to a system RAM chip.

Because I had to specify the model I owned, my extRAM came with the appropriate connections for the Model 100. The device is therefore portable to other 100's. But because I'm contemplating getting a T200 I would need the extra wire adapter to make it completely 100 percent portable to the Model 200.

So their third claim is essentially correct also.

INSTALLING EXTRAM

Installing my Model 100 version of extRAM was a breeze, but before I started I studied the manual thoroughly. Normally I dislike reading instruction manuals, preferring instead to "plug-in and power-on," but the possibility of smoking the M100 (that's engineer talk for causing an electronic part to burn up — I may be a product of the psychedelic '70s but I'm not that weird!) was too much to chance, so I proceeded cautiously. A talented programmer I may be, but I definitely fall into the hardware-hopeless category.

Installation is simple:

- Turn off the Model 100,
- Open the Option ROM compart-

ment,

- Seat the extRAM module into the Option ROM socket,
- Plug the two attached wires into the system bus,
- Button everything up,
- Turn on the Model 100.

The chances of a wiring error causing damage are remote, but be sure that you plug the two attached wires into the right holes of the system bus. It pays to be careful here.

THANKS FOR THE MEMORY

We human beings can get by on a few less brain cells each day, but a computer memory has to be perfect every second that you use it.

The included MEMTST program tests the extRAM memory. The program generates numbers that it writes to memory and then reads back the results. Hopefully it gets back the same number that it wrote.

Memory can fail in many different ways. The most common is a total failure where one or more bits fail. Writing data to the location will produce garbage when read back. Or worse yet, it may cause your system to crash.

This memory test is simplistic in nature; there are more robust memory testing algorithms. In practice it makes little difference, because an extRAM memory failure is likely to lead to a cold start. It can't get any more obvious than that!

USING EXTRAM

Installing the hardware is the easy part. The most daunting task lies ahead: deciding which extRAM "personality" is right for you (not unlike dating triplets).

You'll have to choose between the different software drivers, and the choices presented are confusing at first. My solution was to try each for a few

BIG MEMORY!



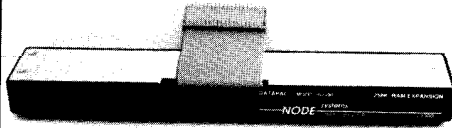
rampac 102/200

2.5" wide X 2" deep X 0.6" external RAM cartridge is easily removeable and plugs into the TANDY MODEL 102 or 200 system bus connector.

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days before I decided which ones fit the way that I work.

BANK-SWITCHED MEMORY

SLX is the basic extRAM file manager. It provides (S)ave, (L)oad and e(X)change functions, hence the name SLX.

You can do many neat things with SLX. I use it with the RAM disk software (which I'll talk about later). I load all my favorite BASIC (.BA) and machine language (.CO) programs into memory, then save them to extRAM with the (S)ave option.

You can use SLX to avoid conflicts between incompatible programs (a common cause of cold starts is program conflicts). You store one program in main memory, the other in extRAM, then use the e(X)change function to swap the contents of extRAM with main memory.

You can use the additional 32K for text storage, if you do a lot of writing. Create and then save a bunch of text files to extRAM, delete them from main memory, and then create a new set. When you get to a desktop computer, PDD, or printer, you can off-load the files in main memory, then (L)oad or e(X)change the stored set and off-load those.

You also can create and save to disk many different extRAM configurations. For instance, you might configure a set of programming tools for when you feel like slinging bits. Or you might have another set of writing tools for when you have to make a living. And perhaps another set with a bunch of games when you want to blow off a bit of steam.

My biggest gripe is that you can't "add" a file once you've done the initial (S)ave operation. It's all or nothing. Adding a file consists of exchanging banks, adding the file, then exchanging banks again. This isn't too hard, but a nuisance just the same.

The (L)oad operation lets you copy a single program from the extRAM into system memory. When you invoke the (L)oad operation you get a "no-frills" list of files and a prompt asking

you to type the name of the file you want to transfer.

END OF THE COLD WAR

My mother always told me to dress warmly in winter. Having an extRAM can potentially ward off a serious chill when an "arctic freeze" sets in. If you use SLX to make a backup of main memory regularly, your work is safe in the event of a cold start. You can recall whatever programs or files that you have stored in the extRAM.

Recovery is not as easy as it sounds, however. You need driver programs to access the data in the extRAM, but you can load them from cassette or disk. If you are not close to your mass-storage devices it is possible to type in a BASIC program that will create the loader, but the program is 16 lines long. It's doable, but you'd only want to do it occasionally.

RAM DISK

EXTMNU acts as a "shell" for several other drivers. Together they make up a "program-text-data archive" or "RAM disk."

EXTMNU calls EXTVUE, which prints the extRAM file directory on the screen. It then asks you which file you want and calls EXTBAS to load the BASIC or .CO program into memory. EXTMNU then runs the program automatically.

When you want to run a BASIC program, you specify the one that you want to EXTMNU, it loads it (via EXTRAS) into the unsaved BASIC area then runs it. Lovely!

I keep a large 13Kbyte telecommunications program in extRAM. Because it takes up RAM space only when it is running, I don't have to reach for my PDD every time I want to run the program. It's nice to carry around 32K of extra pro-

You can use the additional 32K for text storage, if you do a lot of writing.

grams. And it's cold-start proof, too!

Because EME designed the programs to be callable by other programs, EXTMNU does a RETURN when finished. For EXTMNU, this gets you back to BASIC. I quickly got tired of pressing F8 to get back to the main menu, so I modified line 30 and replaced the END statement with a MENU statement. Now my version of EXTMNU leaves me at the main menu.

It took me a while to get these programs straight and what they do. Since they each take up a slot on the M100 menu, you've got to remember which one to select. You might make EXTVUE and EXTBAS invisible files if you use EXTMNU as your primary interface.

I take some exception to EME calling this function a "RAM disk." A disk device typically implies a random-access read/write device. With EXTMNU you cannot write individual files into the RAM disk. You can only save whatever is in main memory all at once using SLX.

EXTMNU does not handle text (.DO) files at the present time. Use SLX to recover your text files. EME claims that additional file management functions are under development. This is one function that I hope to see soon.

HARDWARE REVIEW

EXTMNU is the primary piece of extRAM software that I use. I like to keep a lot of different programs around and then call the one I need into memory. It beats having to lug around a PDD all the time.

ROM EMULATOR

R2D2X isn't some cute little droid but an Option ROM/extRAM-to-PDD/ROM emulator utility. Whew! That's a mouthful. Let's take that description a piece at a time.

First let's introduce some utilities and describe what they do.

ROMCOM writes a binary image of your Option ROM to the serial port. The COMROM utility does the opposite function.

The INTELO program functions just like ROMCOM except that it outputs the ROM image as Intel Hex codes. INTELI does the inverse function.

R2D2X is actually a pair of utilities. The first, R2D, lets you save an image, or a copy, of your Option ROM to your Tandy Portable disk drive (PDD). This includes the contents of your extRAM or whatever is living in your Option ROM socket. Because the Option ROM address space is 32K, three images will fit onto a 100K PDD-1 disk, six on a PDD-2 disk. The D2X program reverses the process.

So, now let's look at the subject of ROM emulation. Simply put, a ROM emulator is a programmable device that mimics an Option ROM. That is, you can reprogram the ROM in RAM.

Let's examine the "Option ROM/PDD" aspect. Here's a typical procedure that you would follow to save your option ROM's to disk:

1. Put the commercial ROM in the socket,
2. Save the ROM to your PDD using R2D,
3. Repeat for all your ROMs,
4. Install extRAM,
5. Run D2X to restore a ROM image to the extRAM,
6. Use the ROM image just like it was a ROM.

With R2D you can make backup copies of your commercial option ROM's. You can leave the ROM's at home and save the hassle of plugging and unplugging ROM's. Just carry a disk with you, and you can have all your custom extRAM configurations as well as your commercial ROM's. Just saving the wear and tear on the Option ROM socket and the fragile ROM's is worth the expense of the extRAM.

The following paragraph is from the extRAM documentation:

"When you purchase commercial software, there are usually restrictions on your rights to copy it, and you usually have no rights to distribute it, except in the case of 'shareware' and 'freeware.' To do otherwise is a violation of federal copyright laws and of rights reserved by the original author and distributor. In general, copying for personal use is OK, so long as the software is not available for use on two computers simultaneously. Some ROM firmware expressly forbids copying in any form. Contact the author or distributor of your commercial ROMware regarding your rights to use it as an extRAM image."

It is clearly illegal and unethical to make copies of commercial ROM's for distribution, whether or not you profit from it. The market for Option ROM's is limited. The difference of just a few sales can be, and has been, enough to force vendors out of the Model 100 market.

Still, it's comforting to know that you are protected if your ROM vendor goes belly-up and your ROM fails. Look at extRAM as an insurance policy.

You can use the COMROM and ROMCOM programs to save ROM images through the serial port to a desktop computer. Remember that you need to be near your desktop when you want to "swap" ROM's. R2D2X is handier for that job.

The INTELI and INTELO programs can be used like

T-200 Enhancement

XOS (Cross bank Operating System) will enhance your Tandy 200 and allow the three banks to share programs and data. XOS will bring a new level of computer functionality at the MENU, from BASIC, TEXT, and TELCOM.

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Cut TEXT from one bank and PASTE it to a file in another bank. Open a "window" while editing in bank #1, and view other files from bank #2. Disable "word wrap" while editing for another perspective of your TEXT file.

While on-line with TELCOM, display FILES and Bytes Free, enter and edit TEXT files, or jump to another RAM bank without losing the host computer connection.

BASIC programs can read/write to files in other banks. Jump to programs in other banks or bring the program into the current bank and run it.

XOS provides fundamental database entry and retrieval functions with user defined fields, prompts, and display parameters. A bargain at **\$24.95**

Node Datapac Users Replace your ROM!!

RAMDSK.CO will replace the Node ROM and allow you to use one of those other ROMs you've always wanted. Retain all of the Node menu functions, plus the ability to move, kill, and name Datapac files under program control. A MUST for Node Datapac owners who have other option ROMs. RAMDSK.CO is available for the M100/M102 and T200... only **\$24.95**

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COMROM and ROMCOM, but they have another interesting application: Option ROM software development.

The normal Option ROM development process, for me, goes something like this:

1. Develop your code on a PC,
2. Cross compile it for the Model 100,
3. Take the Intel Hex output and program an EPROM,
4. Mount the EPROM in a carrier,
5. Install the carrier in the Option ROM socket,
6. Test,
7. Pull out hair,
8. Remove EPROM,
9. Go to step 1 (Do not pass GO, do not . . .)

With INTELI, I can take the output of my assembler and program the extRAM directly. There's no constant programming of EPROM's and attendant wear and tear on the fragile Option ROM socket, not to mention the wear and tear on my nerves.

Traditional ROM emulators for software development cost upwards of \$400. The extRAM is a bargain by comparison.

OTHER HARDWARE COMPATIBILITY

The extRAM is compatible with most other third-party hardware accessories. The notable exceptions are those that use the system bus on the Model 100. For instance, I can't use my PCSG RAM banks unless I modify the extRAM wiring. I believe that it is possible, but I haven't tried it.

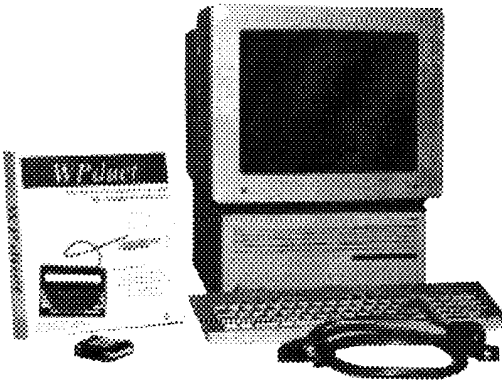
An obvious point: ExtRAM is not physically compatible with any other Option ROM or device that uses the Option ROM socket. It has something to do with a law of physics that states two objects can't occupy the same space simultaneously (unless you happen to drive the highways in Boston).

The T102 and T200 versions connect to the system memory

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chips so any accessory that uses the system bus should be unaffected.

I own a Traveling Software 8-Rompak (a.k.a PGD SAFE) that does use the Option ROM socket. In theory the extRAM should work inside the Rompak but I would have to extend the two extRAM wires from the ROM holder all the way back to the system bus. The extra capacitance for the longer wires may throw the timing off enough to prevent its use in the Rompak. But with the ROM emulation capability of extRAM I don't need the Rompak. I keep it around for nostalgia's sake.

SOFTWARE COMPATIBILITY

The extRAM may actually improve compatibility between different programs. As discussed before, program conflicts become more manageable when recalcitrant programs aren't sharing the same RAM.

The extRAM software drivers are written to run in the alternate LCD (display) memory area. This is a somewhat unexplored area as far as commercial programs are concerned. This further reduces potential conflict with other software.

Tandy 200 owners aren't forgotten either. Included are XOS-C versions of the drivers. The extRAM essentially

serves as a fourth bank of memory but not in the normal sense: You can't "switch" to it, but you can swap any bank with extRAM.

CONCLUSIONS

The extRAM is the kind of breakthrough product that the Model 100/102/200 market has been waiting for, but acceptance by the Model 100 public won't come easily for EME. Because it's so versatile, I believe that people will have a hard time figuring out how the

device will benefit them. I'm still discovering new uses for mine even as I write this article.

It lets me keep handy many of the programs I like to use, without having to carry around a PDD. Often I made the decision not only to leave the PDD home, because of size and weight considerations, but to leave the M100 at home, too, since I couldn't carry enough programs in memory and be sure that I wouldn't have a cold start and blow everything away. And there's nothing worse than a totally empty M100 and no way to fill it.

It'll also save me money, because I don't have to buy a conventional ROM emulator for my software projects.

As currently shipped, the extRAM has some truly useful software. I suspect, though, that the best is yet to come.

Stan Wong's claim to fame is that he once shared a train cabin with Joanne Woodward on a rainy evening in Paris. Other than that, he makes a living by pretending that he knows something about computers. If that's not weird enough, this guy's hobby is playing with his Model 100 and WP-2 as well as writing articles for Portable 100. And you thought we were strange!

MANUFACTURER'S SPECIFICATIONS

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ExtRAM—\$75
ROMBO—\$9

(The extRAM software drivers were supplied under license to EME by Wilson Van Alst and Portable 100 columnist Paul Globman.)

COMPATIBILITY: Model 100, 102, and 200.

Machine Language File Transfer in *TELCOM*!

HXFER converts your machine language programs for easy and simple transfer with your computer's built-in TELCOM!

by James Yi

Both the Model 100/102 and Tandy 200 come with *TELCOM*, a built-in communication program supporting ASCII file transfer protocol. It is easy to use and convenient, but it can handle only ASCII files. To transfer binary files that have 8-bit characters in them, like *.CO* files, you must either (1) use another terminal program that can support transferring 8-bit data, such as Xmodem, or (2) modify the data so it can be handled by the ASCII protocol.

.CO and *.DO* are usually the file name extensions for binary files and text files, respectively, on the M100/102 and T200. *HXFER* makes *.CO* file transfer possible using *TELCOM* by converting it to a *.DO* file, substituting each byte in the *.CO* file with its hexadecimal representation (base 16 counting, where 10 equals A, 11 equals B, . . . , and F equals 15). The advantage of using this method is that the conversion process is very fast, because *HXFER* is written in machine language and the conversion process itself is very simple. The drawback is that the size of the *.DO* format file is twice that of the original *.CO* file.

The conversion process is very fast, because *HXFER* is written in machine language

WHAT IT DOES

A *.CO* file has a 6-byte header followed by data. The header has three elements of two bytes each, describing the file's loading address, called the *Top*, the length (*Top* + Length - *End*), and the execution address, *Exe*, if it is an executable machine language program.

When converted, each byte in the *.CO* file is represented by a pair of hexadecimal characters in the *.DO* file, and CR (carriage-return) and LF (linefeed) characters are inserted in every block of 128 characters, to separate the hex data into lines of 128 characters. It is important to group the data into lines of such length because most host computers will not accept text properly if the lines are too long. In addition, there may be some extra data added at the end to provide information needed to locate

```

5 REM HXFER.100 by James Yi (C)1989
10 INPUT "Location for HXFER ( 0=under H
IMEM,      1=under MAXRAM, or a specific
address ) ";A:CLS
20 IFA=0THENA=HIMEM-963 ELSE IFA=1THENA=
MAXRAM-963
30 CLEAR 256,A:A=HIMEM:E=A+962:FOR P=ATO
E
40 PRINTCHR$(13);E-P;:GOSUB 70:IF L$>"Z"
THEN W=D:GOSUB 70:W=W+D*256+A:D=INT(W/2
56):POKE P,W-D*256:P=P+1
50 POKE P,D:NEXT:IFC<>103930THENPRINT"Ch
ecksum failed.":BEEP:END
60 SAVEM "hxfer",A,E,A:MENU
70 IFS=0THENREADS$:S=LEN(S$)
80 H$=MID$(S$,LEN(S$)-S+1,1):L$=MID$(S$,
LEN(S$)-S+2,1):IFL$<"a"THEND=(ASC(H$)-65
)*16+ASC(L$)-65 ELSE D=(ASC(H$)-97)*16+A
SC(L$)-97
90 C=C+D:S=S-2:RETURN
100 DATA MNJMGCBnnabCCFCPGDOABMNCLHPMNF
NFMNMCHEOMNEGCBMNDDBECMNDKBPBjgad
110 DATA MNJBFBHMNMLBCPOANMKAAAANGDBMKdja
adNMKhnacDNMCaoaaMHCbdjadMNJBFBHMN
120 DATA DOEGNHMKaoaaDOABMNaoadDOABMNLPE
MAOAGBBMOPKMNkgabBCBDANMCffaaCBAA
130 DATA AACCImpMCbecadMNJBFBHNEEGNHOFc
KMOPKOLOBMEOLAICKMOPKEEENOLAICc1k
140 DATA adOFMNIJCAMEgjacMNEGCBMNbmacDOA
BMNLPPEMNIJCAMBONAJNJBDBDBDBDONHM
150 DATA LFMKkgaAJNJBDBDCKMOPKECELAICcm
aadCKNAPKEEENFMFMNkgabNKpmabBCBD
160 DATA ALHILBMcliaaMBCKMOPKAJCLCCNAPKO
BAJCCNCPKAIOLMNdabBKBDMnekabPOAD
170 DATA MCapabCKmaadBJEEENCKloadAIMCpia
aPFMNdabPBMdaoabONEEENCKMOPKAINC
180 DATA aoabCKNAPKAINKaoabCKlkadAJNJBPD
OACNENCEGECELCKNCPKCLAINCnjaaCKlo
190 DATA adHMLFMKaoaaOLCKmaadEEENOLAIOLO
NEEENCKlkadAJNJMNdabMDboabMNkgab
200 DATA DCloadMNkgabDClpadMJPODPNKfhabP
OMCNCfhabDOABMJEHPOONMKfeabOGPHPO

```

Continued.

Listing 1. The Model 100/102 version of *HXFER* for converting machine-language files to an ASCII format for *TELCOM*.

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some programs properly (more on relocating later).

Machine language programs usually run in the *HIMEM* area, the area reserved when you type *CLEAR A,X* from *BASIC*. *X* is the beginning of *HIMEM* and *MAXRAM* is its end. When you run a *.CO* file, the computer moves the file's contents to the *Top* location and executes it there.

Because *HXFER* also runs in *HIMEM*, it does not load the target *.CO* file into the *Top* location to read or write to it while converting. This is to prevent accidentally erasing *HXFER* if the target file happens to occupy the same *Top* memory locations. Instead, it finds the *.CO* file in the normal file storage area and reads or writes directly to it.

CHANGING THEM BACK

When *HXFER* converts the *.DO* file back to *.CO*, it gives you the option of relocating it. Relocating enables a machine language program to run at a different address than the one for which it was originally created. Relocation is possible only if the *.CO* file is a machine language program, not a data file (such as *MSPLAN*'s spreadsheet work file).

You might want to relocate a program if you have two or more programs that must coexist, but which compete for similar memory locations. For example, if the Tandy Portable Disk Drive DOS is running in *HIMEM* and you want to run another program that loads in the same area, you would have to relocate that program above or below the DOS. That way it won't erase part or all of the DOS code when it is loaded, causing the DOS to crash.

Relocation involves adjusting all address references within the program so that they correspond to the new program location. Because an address pointer is two bytes long, it would be possible to relocate a program by looking up all the machine language instructions that have two-byte operands and, if the operand is a reference to a point within the program, adjust it. This method works fine, unless some address pointers are not operands of instructions but show up by themselves, such as when they are listed in a table. As a result, the relocater cannot recognize it as an address pointer. *HXFER* can overcome this problem by letting you specify where there are such address pointers, if you know them.

The programmer who created the program would know where these address pointers are. He can make the program relocatable by adding relocation information data to the hexadecimal file. Relocation data is a list of locations of the address pointers that the relocater cannot recognize. The locations are in

```

21Ø DATA NDMKhaabOGMHPOMGMKhaabPOAGMChda
bDOACMJHIOGOPPOCIMKhaabOGMPPOABMK
22Ø DATA kdabPOMNMKkdabHIOGOHPOCCMKkdabH
IPOMCNKfeabPOMDMKkdabOGAHMKfeabBP
23Ø DATA NKfeabDOADMJMNmcabPOBKMklpabAHA
HAHAHGHOFMNmcabOBPOBKMklpabLEMJKP
24Ø DATA DHMJMNHKEOPOBKMINGDANKmcabPOAKN
IPOBBNMcabPOBHNCmcabNGAHMJHLPODE
25Ø DATA MKpaabPOAHMKaiaCPODHMKpgabMDHLA
ECBihadMDalacCBhjadMDalacMNIJCAMN
26Ø DATA gjacCBiadMDalacCBLBGAOFMNCHEOO
BMNJBFBHMNCJECMNBAFDMDaoaaMNIJCAAME
27Ø DATA NJBPMNOECAOFCKLAPLOFCKNAPKHLFM
KBHDPOFABAGAAAJEENCKLCPLCCJJPLNE
28Ø DATA GNGLNKBHPOLCBMOPKMNEACFCCKMOPKM
BMNNLGLOBCCCLAPLOBDOKAOLCKJJPLOLMN
29Ø DATA DJCCMNEGCBCKIOPLMJHOCDFOCDFGCLC
LPOMAMKLPBPPOIAMKBHCAMDNJBPCBgaad
30Ø DATA MNJBFBHMNDOEGNHMKaoaaMNPKCBMNALE
MMNIJCAMKpaabMNEMCCCBgjadmNJBFBHMN
31Ø DATA DOEGNHMKaoaaDOACMNaoadMNEGCBD OA
BMNLPEMMNEMCCMNIJCACBImadDGIACDDG
32Ø DATA AANFBDBDONABAGAAAJEENNBMNnjacB
DALHILBMCmmacMDaoaaBKAPAPAPAPMnoc
33Ø DATA acBKOGAPPOAKNkolacMGAHMGDAMNpoa
cCBImadDFMADGIADOANMNpoacDOAKMNEE
34Ø DATA ELCBInadDFMADKmcadPOPIABEMJPFM
NPKCBMNALEMMCBkadBGPiHKDCmcadCBAH
35Ø DATA AAPBFPDOABMDBCENEDGPHCHCHFHAEHC
AEIGFHICAEGGJGMGFAACOEEEPCAEGGJGM
36Ø DATA GFAAEMGPGBGECAGBHDPCACIDMEDFCD
OCAGGGPHCCAEEGFGGGBHFGMHECJDKCAA
37Ø DATA COEDEPCAEGGJGMGFAAEIGFHICAEPHFH
EHAHFHECAECCJGMGFAAECBGECAEGGGJGM
38Ø DATA GFCAGOGBNGFAAEGGJGMGFCAGOGPHEC
AGGGPHFGOGEAADBCJCOEEPCNCNDOCOED
39Ø DATA EPDLCAJCCJCOEDEPCNCNDOCOEEEPDLC
ADDCJEFHIGJHECADPCAAAAAAAAAAAAAAAA
40Ø DATA AAAAAA
    
```

End of listing.

hexadecimal format, upper case, and low byte first. For example, if a program's *Top* is \$EA60 (the \$ indicates that the following numbers and letters are in hexadecimal format,

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```

5 REM HXFER.200 by James Yi (C)1989
10 INPUT "Location for HXFER ( 0=under H
IMEM. 1=under MAXRAM, or a specific
address )";A:CLS
20 IFA=0THENA=HIMEM-875 ELSE IFA=1THENA=
MAXRAM-875
30 CLEAR 256,A:A=HTMEM:E=A+874:FOR P=ATO
E
35 FOR P=ATO+874
40 PRINTCHR$(13);E-P;:GOSUB 70:IF L$>"Z"
THEN W=D:GOSUB 70:W=W+D*256+A:D=INT(W/2
56):POKE P,W-D*256:P=P+1
50 POKE P,D:NEXT:IFC<>91451THENPRINT"Che
cksum failed.":BEEP:END
60 SAVEM "hxfer",A,E,A:MENU
70 IFS=0THENREADS$:S=LEN(S$)
80 H$=MID$(S$,LEN(S$)-S+1,1):L$=MID$(S$,
LEN(S$)-S+2,1):IFL$<"a"THEND=(ASC(H$)-65
)*16+ASC(L$)-65 ELSE D=(ASC(H$)-97)*16+A
SC(L$)-97
90 C=C+D:S=S-2:RETURN
100 DATA MNNMIDCBniabCCDEOPMNFHBMNOGFMM
NGCCMMNENEPMNCKCKBdaaDMNJOGHMNPH
110 DATA BCPOANMKAANAANGDBMKdeaaDNMKbhacD
NMCajaaMHCbndacMNOGHMNPAFENHMKAj
120 DATA aaDOABMNkiacDOABMHOFLAOGABBLP
EMNkbabBCBDANMCfaaaCBAAAACDPPHCB
130 DATA nmacMNJOGHMNPGFENHOFCKPLPEOLOBM
EBGAJCKPLPEEEENOLAICCgcadOFMNKGCL
140 DATA MECMCLMNGCCMMNGDADOABMNHOFMKNK
GCLMBONAJNJBDBDBDNHMLFMKkbaAJ
150 DATA NJBDBDCKPLPEECELAICCGiadCKPNPEE
EENFMFMNkbabNKphabBCDALHILBMClD
160 DATA aaMBCKPLPEAJCLCCPNPEOBAJCCPPPEA
IOLMNDiabKBDMNefabPOADMCAkacCKgi
170 DATA adBJEENCKggadAIMCpdaaPFMNDiabP
BMDajabONEEENCKPLPEAINCajabCKPNPE
180 DATA AINKajabCKgcadAJNJBDOACNEIHFFE
    
```

Listing 2. The Model 200 version of HXFER.

\$EA60 equals 60000 decimal), and there is an address pointer at \$EB07 (60167 decimal) that HXFER cannot recognize, add 07EB to the end of the hex file. If there is another at \$EB20, add 07EB20EB, etc. There doesn't have to be any relocation data if

```

CELCKPPECLAINCneaaCKggadhMLFMKaj
190 DATA aaOLCKgiadEEENOLAIOLONEENCKgca
dA.JN.JMNDiabMDbjabMNBkbabDCggadMNBkb
200 DATA abDCghadMJPODPNKFcabPOMCNCfcabD
OABMJJEHPOONMKepabOGPHPONDMKglabOG
210 DATA MHPOMGMKglabPOAGMGOabDOACMJHIO
COPPOCIMKglabOCMPPOABMKjoabPOMNKM
220 DATA joabHIOGOHPOCCMKjoabHIPOMCNKepa
bPOMDMKjoabOGAHMKepabBPNKepabDOAD
230 DATA MJMnInabPOBKMKlkabAHAAHAAHGHOFM
NInabOBPOBKMKlkabLEMJKPDMJMNDGFN
240 DATA POBKMINGDANKInabPOAKNIPOBBNKIna
bPOBHNCInabNGAHMJHLPODEMKolabPOAH
250 DATA MKadacPODHMKpbabMDKGAECBcbadMDa
gacCBbdadMDagacMNGKGLMNCMCLC BMCac
260 DATA MDagacCBKMGJOFMNOGFMOMBNJOGHMNE
FEPMNAOGCMDajaaCBpkacMNJOGHMNPAFE
270 DATA NHMKajaaMNEDCNMNMKFKMNGKGLMKola
bMNLPCNCBadadMNJOGHMNPAFENHMKAjaa
280 DATA DOACMNkiacMNGCCMDOABMNHOFMNLPC
NMNGKGLC BgeadGDIACDDGAANFBDBDONAB
290 DATA AGAAAJEENBNHdacBDALHILBMCgga
cMDajaaBKAPAPAPAPMNMhmacBKOGAPPOAK
300 DATA NKifacMGAHMGDAMNjiacCBgeadDFMAD
GIADOANMnjiacDOAKMNAFFKCBgfadDFMA
310 DATA DKgadPOPIABEMJPFMNECNMNMKFKM
CleacBGIHKDCgkadCBAHAAPBFPDOABMD
320 DATA NBFLEDGPHCHCHFHAHECAEIGFHICAEGG
JGMGFAACOEEEPACAEggJGMGFAAEMGPGBGE
330 DATA CAGBHEDPCACIDMEDFCDOCAGGPHCCAE
EGFGGGBHFGMHECJDKCAAACOEDEPCAEGGJ
340 DATA GMGFAAEIGFHICAEPHFHEHAHFHECAEGG
JGMGFAAECGBGECAGGJGMGFCAGOGBNGF
350 DATA AAEggJGMGFCAGOGPHGAGGPHFGOGEA
AANAKDBCJCAHICOEEEPACACNCNDOCAHICO
360 DATA EDEPANAKDCCJCAHICOEEEPACDMCNCNC
AHICOEDEPANAKDCCJCAEFHIGJHEANAKAK
370 DATA DPAAAAAAAAAAAAAAAAAAAAAA
    
```

none is necessary.

On the other hand, suppose that HXFER falsely recognizes something as an address pointer. This could be some numeric

Continued on page 26.

COMPATIBILITY: Tandy 100/102

RUN.100

Run any .CO file with a single, simple command.

by Paul Globman

Machine language programs, which have a .CO file extension, require that the program load and run in a specific RAM location, for which the program was designed when it was written. When you select a .CO program from the menu and try to run it, sometimes it will not run, and instead will beep and return to the menu.

This apparent failure will occur when the memory location at which the program needs to run is not properly reserved for the program's execution. This is done to protect the computer so it doesn't load the .CO program into an area of RAM that the computer is using for its own "operating system" (i.e., stack operations, file buffers, etc.).

To overcome this problem you must use a CLEAR statement to reserve the correct amount of RAM before attempting to run the .CO program. Another option is to have a small BASIC program CLEAR the appropriate RAM and then RUNM the program you want to run. This option has its own problem: It requires a separate "loader" program for each .CO program you want to run. A more complete solution is to have just a single loader program that will properly adjust the reserved RAM for, and then run, any .CO file.

RUN.BA (Listing 1) is that loader program. Type it in, save it as RUN.BA, and then keep it in RAM. To use it, put the cursor over the .CO file you want to run, type RUN BA (at the Select: prompt on the menu), press ENTER, and the .CO program

```
0 REM CMD.BA (c) 1990 by Paul Globman
1 A=64929+2*PEEK(65006):A=PEEK(A)+256*PEEK(A+1):POKEA,PEEK(A)OR8:POKEA+9,32:POKEA+10,32:MENU
```

Listing 1. RUN.BA automatically runs any .CO file, hassle free!

under the cursor will run. (This is very similar to KILL.BA [Portable 100, Jan. '89], which allows you to cursor-select a file on the menu and type KILL to delete it.)

Note: RUN.BA is used to run HIMEM .CO programs only, and is not for ALTLCD .CO programs (which run in TELCOM's previous screen buffer), since ALTLCD programs do not require a reserved area of HIMEM to run in.

Now let's make RUN into a full-blown "command" with ...

CMD.100

At the Model 100 menu you can type in a file name and press ENTER, and that file will run, but it's not quite the same as typing a command ... or is it?

Programs like RUN.BA, above, or KILL.BA (Portable 100, Jan. '89) are unique in that they only operate on the file under the menu widebar cursor. Thus, they can be made into "commands" by (1) making them invisible, and (2) removing the .BA extension so you only need to type RUN or KILL and press



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ENTER. Invisible and extensionless, they take on the characteristics of commands instead of programs.

CMD.BA handles that. It makes a file invisible and removes the extension. To use it, select the program you wish to make into a command, such as RUN.BA. With the cursor over RUN.BA, type CMD.BA at the Select: prompt on the menu and press ENTER. RUN.BA will disappear, but it's still there, invisible and extensionless. You can use RUN as a command from the menu to run a .CO program that would normally require

```
0 REM RUN.BA (c) 1990 by Paul Globman
1 A=64929+2*PEEK(65006):A=PEEK(A)+256*PEEK(A+1):FORX=3TO8:F$=F$+CHR$(PEEK(A+X)):NEXT:R$="RUN"+CHR$(34)+F$+CHR$(13)
2 A=65450:POKEA,12:FORX=1TO12:POKEA+2*X,0:POKEA+2*X-1,ASC(MID$(R$,X)):NEXT:ONERR ORGOTO3:LOADMF$
3 CLEAR99,PEEK(64206)+256*PEEK(64207)
```

Listing 2. CMD.BA turns a program into a "command."

HIMEM to be properly prepared.

Note: If you run CMD.BA from the menu by selecting it with the cursor and pressing ENTER, it will operate on itself and become invisible (and its .BA extension will be removed).

Next month, another "command" program for Node users.

Editor's note: The KILL.BA program listing (Jan. '89) contained an error. To use it, change the POKE AD,10 in line 2 to POKE AD,5.

Also note that, once made invisible, a file can still be killed from BASIC if desired. For example, to kill RUN, enter BASIC, type KILL "RUN" and press ENTER.

-MN

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).

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.

WHERE'S THE RAM?

I am interested in installing extra RAM in my Model 102. I understand there are 32K modules, about the size of a pack of cigarettes, that plug in at the system bus on the back of the computer. Do you know who makes them?

Milton Anker
Tamara, FL

Fortunately for you, there are several options now available. The Node Systems RAMPac and Datapac are the ones you are thinking of. The Datapac fits underneath your Tandy 102 (measuring roughly 2 in. deep, 12 in. wide, and .75 in. thick) at the back. It raises the back of the computer about the same distance as the little leg extenders that Tandy used to sell and uses a cable to attach to the system bus on the back of the computer. Both 128K and 256K versions are available. The RAMPac plugs directly into the bus connector and sticks out 2 in. from the computer. It is thin, only 0.6 in. thick and is only slightly wider than the bus connector itself (2.5 in.). This, too, is available in 128K and 256K sizes. For more information, see their advertisement in this issue.

Also available, but in much smaller RAM size (32K only), is the EME extRAM device that mounts internally to your computer, in the option ROM socket. For more information on this device, see our review in this issue.

Finally, Club 100: A Model 100 User Group, sells 128K and 256K RAM expansion units. For more information on these, see their advertisement.

-TK

ASSEMBLY LANGUAGE BOOKS

I have a Model 200 and use it for work and play, but I'm getting bored again, so I was wondering if you could point me in the right direction to learn assembly language for the 8085 microprocessor. I have looked in book stores and can't find a thing on the 8085, everything is for the IBM and compatibles. I need to know a

little more about the memory above MAXRAM also. Can you help?

Lawrence D. Taylor
Ardmore, OK

Finding a book on the 8085 is not easy; most are out of print and unavailable. The best one, 8080A/8085 Assembly Language Programming by Lance A. Leventhal, is from Osborne/McGraw Hill (ISBN 0-931988-10-1). Your best bet is to get a book on the 8080A instead. The 8085 is just a slightly modified version of the 8080, having only two more instructions, esoteric ones most programmers will never use: SIM and RIM. The only other difference is that the 8085 has hardware to support RST 5.5, 6.5, and 7.5 commands.

Once you start working with assembly language programs, you'll need an assembler and debugger program to help you work. I suggest you buy the TMN Assembler and TMN Debugger programs from Granite Street Portables.

Memory maps of the system ROM are available on our Portable 100 BBS. Also available are maps of the memory above MAXRAM.

-TK

CALENDAR CORRECTIONS

I'm an original subscriber from 1983, with one of every issue published in my collection. Although I cannot say that I found each issue to have been to my complete satisfaction, I think enough of it to renew it every year.

I have started rereading all my copies and keyed in the Calendar Program by Alan Zeichick, published in the August 1987 issue, and cannot get it to work, however much I have tried. Enclosed is a printout of my listing.

I wrote the program as a .DO file and checked it against the published listing. When I go to BASIC and attempt to LOAD the program in BASIC, I get a ?DS Error. Attempting to RUN the program gets me to lines 1000, 1010, and 1020

where a ?Redo from start prompt appears. I have also tried adding print error code; ERL and ON ERROR GOTO and get Direct statement in file.

Charles L. Redman, Jr.
Fairfax, VA

The ?DS Error message appears when you try to load into BASIC a line longer than 242 characters (lines longer than this are truncated, and any characters leftover are used on the next line), or when you try to load into BASIC a line that does not begin with a number. In examining the listing you sent, I see that none of the lines are longer than 242 characters, so that isn't the problem.

The only other way it could happen would be if you inadvertently terminated a numbered line with an ENTER (carriage return) and put the rest of the line on a new line without a leading line number. For example, line 50 should read 50 DATA SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, SATURDAY all on one program line (not display line). If you have typed the SATURDAY on a line by itself, you would get the ?DS Error message as BASIC tries to load the SATURDAY line without a line number.

The way to find these types of errors is simple. In BASIC, load the program. When you get the ?DS Error, type LIST and see where the program stops. Look at the last line successfully loaded and see if it is complete and matches the published listing. If it is, then the problem is with the following line, which failed to load. Go back to your TEXT version of the program and correct the program by removing the extra carriage return. Repeat this until the program loads without giving you the ?DS Error message.

The ?Redo from start message means simply that you've typed in alphabetic characters where the program was expecting numbers. That is, in line 1020, the program wants you to type 12,90, not December, 1990.

Good luck; let us know how things go.

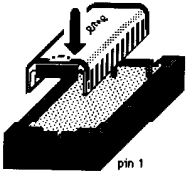
-TK



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extRAM... \$75 ea. + tax (CA) + \$3/order ship.
which model? M100 T102 T200
disk... \$10 ea. + tax (CA) w/ extRAM purchase.
disk format? TDD MSDOS Mac

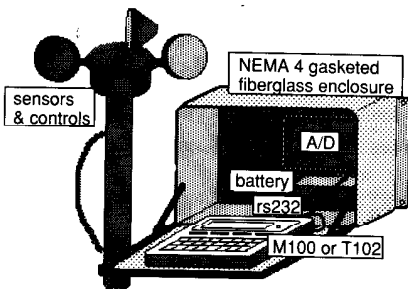
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Continued from page 23.

or text data that happens to look like an address pointer. You can prevent *HXFER* from adjusting this data by including the location of this data in the hex file, in the same format as relocation data, except this information is listed before the relocation data and arranged in the order of their appearance. To figure out where relocation data is needed, it is necessary to use a debugger and examine the code to decide if the relocater will recognize address pointers where you did not intend them. It does get hairy for the programmer, but not the end user.

USING *HXFER*

The Model 100 version of *HXFER.CO* is 963 bytes long; the Model 200 version is 875 bytes long. The *BASIC* loader will ask for a loading address where *HXFER* should run. Enter 0 if you want to load it just under current *HIMEM*, 1 for just under *MAXRAM*, or enter a specific address if anywhere else. After it creates *HXFER.CO*, you can remove the loader from RAM and store it. When you run *HXFER.CO*, it displays all the files in RAM and prompts for a command. Choose 2 to convert a .CO file to a .DO file, 3 or *ENTER* to exit, 1 to convert a .DO file back to a .CO file. A .CO filename will be same as that of the .DO file. When it

asks for a loading address, just press *ENTER* to load it in its original location, or enter a specific address to relocate it. For 1 and 2, the .DO file can be in a device, such as a disk drive or cassette, if you supply the device specification in the file name, e.g. 0:File, CAS:File, or even COM:67IIENN, for transferring directly to another computer through the serial port. A .CO file can only be in RAM. The .DO or .CO extension can be omitted from the filename. When reading from the .DO file, all characters other than capitalized hexadecimal characters are ignored, so you can insert comments in the hex file if the comment does not contain any hexadecimal characters.

There are other ways of converting .CO to text format, and one of them is to create a *BASIC* loader, like the one used for loading *HXFER.CO* in this article. Back in the March 1988 issue, the article "Making BASIC Poke Programs" showed how to store a .CO file as *DATA* statements in a *BASIC* loader. There also is a utility named *BASBLD.PW3* in the CompuServe M100SIG forum that makes it very easy to create a relocating *BASIC* loader. But if you opt for speed and compactness of a .DO file, *HXFER* would be a better choice.



COMPATIBILITY: MS-DOS computers.

PC Study Bible

If you're interested in the Bible, this program is a fantastic aid to finding the answers to your questions, quickly and easily.

by Terry Kepner

Do you regularly pick up your Bible and search for answers? Are you curious about the different Bible versions and how they compare? Do you like to, or need to, incorporate Bible verses in your writing?

If you answer yes to any of these, then you'll find *PC Study Bible* an impressive package. *PC Study Bible* is extensive (it gives the complete text of the King James Version, American Standard Version, and New International Version, as well as Nave's Topical Bible), powerful (windowing features allow you to display any verse in all versions simultaneously), and convenient (it provides a simple, but complete, word processor and concordance).

THE PACKAGE

PC Study Bible consists of a set of ten 3.5-inch diskettes (slightly more than 5MB of files) with two thin, under 80 page, user manuals. Installing the program files is simple; just copy the disks to your hard drive or your work disks (backup copies are not a problem, the files are not copy-protected).

Working the program requires two disk drives: one for the program and its files, the other for data disks. While it's possible to work the program with only floppy drives, the many disk changing this requires makes it a tedious proposition. The program should be used on a hard drive computer, such as the 1400HD, 1500HD, or 2800HD.

Once you have the files installed on your hard drive, you simply run the *BIBLE.EXE* program. You are immediately given a menu of seven items: *Introduction*, *Go to Bible*, *Go to Bible—start at bookmark*, *Go to Concordance*, *Go to Nave's Topical Bible*, *Go to Word Processor—new file*, and *Go to Word Processor—existing file*. The *Go to Bible—start at bookmark*

option is a good feature for picking up where you last left off, or for going to verses you frequently have to look up.

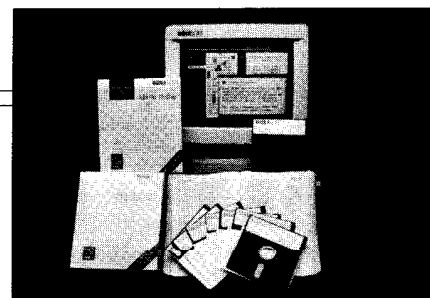
EASY TO USE

Going to the Bible section leads you to a split-screen side-by-side window affair, with function key labels running across the top. The program starts by

The program uses multiple windows to display help instructions and information simultaneously.

asking you which book of the Bible you want, then the chapter and verse. If you don't know precisely where you want to go, pressing ESC leaves the left window blank and a series of help commands in the right window (i.e., arrow keys move up and down by verses, PgUp scrolls up a page, PgDn scroll down a verse, etc.).

Now you can use the function keys to navigate: The F1 key is simply a help key that explains how the function key commands operate (the explanations are very thorough); F3 is used to move between the different modules (exit program, switch windows, move to a new reference, chapter, and verse, move to the Concordance, move to the Word processor, move to Nave's Topical Bible,



PC Study Bible for the Bible student. Shown is the 5.25-inch version. 3.5-inch disks are also available. move to the notepad, and move to Strong's Greek/Hebrew—an add-on module not supplied with the main program); F5 gives you a list of the books of the Bible with the abbreviations used by the program, an option to change the abbreviations used to something you like better, the ability to change the version of the Bible in use, and an option to change the default version used when you start the program each time; F7 moves you to Naves Topical Bible, pulls up a cross-reference list, displays a verse in a pop-up window, places a bookmark, uses a reference from the bookmark file, adds a current verse to the bookmark file, and gets a reference from the bookmark file (these last three give you a dandy way to create your own subject index); and F9 controls the windows (how many are on the screen to a maximum of three, how the text is displayed, setting them to the same reference, and locking them into synchronization so you can scroll two or more versions of the Bible for instant verse beside verse comparison of their translations).

Once you pull up the chapter and verse you want, you can scroll through the entire book it is pulled from. When you find a verse of interest, pressing the C key automatically copies the selected verse to the notepad. Each time you press C a verse is copied, added to the previous entries, until you decide you are finished. Each entry copied includes the book, chapter, verse, and version of Bible

it came from. The ability to look at two or three versions or two or three different verses simultaneously is a powerful tool.

If you decide you want to look things up, the Concordance and Nave's Topical Bible are immediately available to you via the F3 key. You also can go to the Word processor, but more on that in a minute.

THE CONCORDANCE

The Concordance isn't really a concordance as such. Instead of limiting you to only those topics someone else put together it performs a complete search of the Bible version you have loaded, looking for the words you specify. When it finds them, it makes a list of the verses for you to scan and select from. It supports both *AND* and *OR* searches.

You actually have five choices with the Concordance: a single word, a phrase, matching a list of words found in a verse (*AND*), find a verse with any of a set of words (*OR*), and a combined *AND/OR* search, with a limit of six words included in each search.

To help you with permutations, the program lets you specify whether you want it to find suffixed words as well as the target word. For example, typing *lord* would normally find all occurrences *lord* and *Lord*, typing *lord..* with two periods following would also find any instances of *lordly*. Most of the common suffixes are included.

You can, of course, specify the range of books you want to search.

Once you find what you want, you can copy the verse to the notepad, or copy all the verses found. If you already have information in the notepad, from the main program for example, these are added to it.

NAVE'S TOPICAL BIBLE

On the other hand, a concordance can only help you with exact word matches, it can't find ideas. If you want all occurrences in the scripture where it mentions wives, the concordance will show you only the verses that explicitly mention the word wife, not very helpful.

Nave's Topical Bible, on the other hand is an index to 100,000 verses cross-referenced under almost 20,000 topic headings. This makes it much faster and easier. Plus, once you find a topic, you can ask for a list of related topics by pressing the F key. These cross-references may have further cross-references under them, increasing your search to areas you might not have originally considered.

Like the main program, when you find the verses you want, you can copy

them to the notepad for use in the word processor, where they are appended to previous entries, if any. You also can change the version of Bible you are searching.

Naturally, once you've selected a topic, you can change topics by simply pressing a key and returning to the main topic prompt or to a short list of subtopics under the main one you selected.

NOTEPAD & WORD PROCESSOR

The Notepad is available in all the programs, and acts like a very simplistic word processor. It pops up on the lower half of the screen and displays all the verses you've copied to it so far. You can scroll through these verses a line at a time and even edit them, but the program is designed just to give the bare minimum of functions. Its purpose is to provide a link between the different modules, not act like a word processor. The ESCape key closes the window without losing your data.

When you're ready to work with the information in the Notepad, you move into the word processor.

On entering the word processor, it asks you if you want it to use the information in the notepad, if there is any there. Answering yes get that information dumped into the word processor where you can work on it.

The word processor uses all ten function keys to provide all the options normally used with a full-featured word processor: Help; format (margins, paragraph indents, tabs, etc.); search and replace; line centering, deleting, inserting, splitting and reformatting; block copy, move, and delete; disk file read, save, copy, and list; printing; and set switches for word wrap, indentation, color, justification, and so forth. Plus, you can copy or display Bible verses, open a Bible window, and change the Bible version you are using. Like the other modules, the F3 key moves you to other parts of the *PC Study Bible* package.

The Word Processor is not a *Wordperfect*, *Wordstar*, or *Microsoft Word* competitor. It is a simple, sturdy, easy to learn and use program. While it cannot provide for italic or bold printing, it does all the other basic functions of single or double line spacing, page perforation skipping, margin controls, page numbering, single-sheet feeding, forcing page feeds in the middle of a page, and setting six or eight lines per inch. For someone who doesn't already have a word processor, this one is certainly a good one to start with.

If you do already have a word processor and need fancier output than this one

can provide, the files saved by this one are compatible. Saved files are straight ASCII, with carriage returns placed after every line, or you can save them with carriage returns only after paragraphs.

SUMMARY

I could go on for pages describing all the features in detail, but we simply haven't the room. I found the program easy to use, and was VERY impressed with the degree of integration the different modules showed. Moving between them is certainly easier and faster than what most of the so-called "integrated software" packages show. I wish the word processor had more features, such as italic, boldface, footnotes, and a few other items, but then again, why create a competitor to the big-guy word processors when the current version works so well?

The only disappointment was my discovery that Strong's Greek/Hebrew Dictionary isn't included in the main package. This dictionary lets you look up the original Greek and Hebrew words that make up the Bible, and read for yourself what their translations are. This is especially helpful for those words that don't translate well into English, you can see for yourself how some passages can change meaning depending on the translation of key words.

If you read the Bible, write about the Bible, or just want to understand the Bible better, this program is well worth the money. It provides three full-text versions of the Bible for your use, an extensive index, and incredibly easy-to-use features.

MANUFACTURER'S SPECIFICATIONS

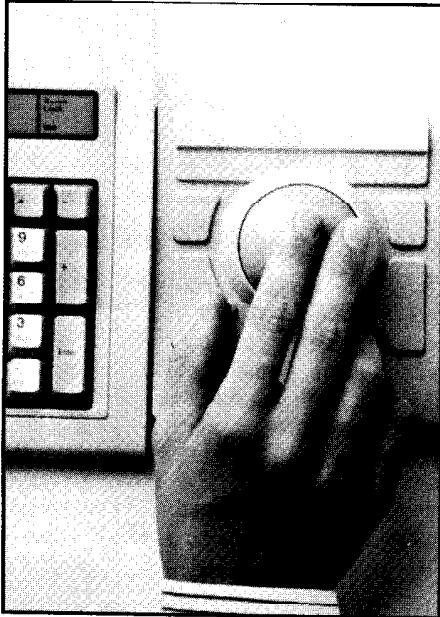
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(206) 824-0547

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King James Version, American Standard Version, New International version, Nave's Topical Bible, all included.

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New King James Version—\$49.95
Revised Standard Version—\$49.95
The Living Bible Text—\$49.95

CH Products Introduces RollerMouse

CH Products has introduced *RollerMouse*, a trackball designed to replace a conventional mouse with a high-performance, full-featured pointing and controlling device. *RollerMouse* is available for IBM personal computers and Apple II and Macintosh platforms. With *RollerMouse*, there is no dragging of the device across a cluttered desk nor any of the maintenance problems associated with that type of usage.



RollerMouse is 100 per cent Microsoft Mouse compatible.

Based on an opto-mechanical design, *RollerMouse* is designed as a direct plug-compatible mouse replacement, and its install procedure is identical to that of a mouse. The trackball features automatic acceleration which matches the speed of the ball to the cursor for pin-point accuracy.

RollerMouse is 100 per cent Microsoft Mouse compatible. The PS/2 and Macintosh versions feature full keyboard protocol implementation.

With programmable pop-up menus, *RollerMouse* works with software written with or without a mouse in mind. Support of standard 200 dots per inch (DPI) resolution ensures that *RollerMouse* is compatible with desktop publishing, CAD/CAM/CAE and other graphical applications that require intensive and precise cursor movements. CH Products ensures compatibility with *AutoCAD*, *VersaCAD*, *Pagemaker* and *Ventura Publisher* as well as other popular microCAD, desktop publishing and graphic packages.

A unique four-button design

features easy, flexible access to cursor controls for either right- or left-handed users. The large buttons provide normal Click functions, while two smaller buttons lock the cursor in the down position (Click Lock) for quick, easy drag across the screen. The oversized ball allows both fingertip and full-hand control.

On the Macintosh version, a back-panel T-connector cable allows the user to plug multiple devices through the Advanced Desktop Bus. The PC XT/AT version plugs into the RS-232 serial port with either a 9- or 25-pin connector while the PS/2 version connects through the dedicated mouse board. *RollerMouse* features a one-year replacement warranty.

The IBM PC XT/AT, PS/2, Apple II, and Macintosh versions are priced at \$169.95. The PC Bus version is priced at \$189.95. For more information, contact CH Products, 1225 Stone Drive, San Marcos, CA 92069 (619)744-8546 or circle #63 on your *Reader Service card*.

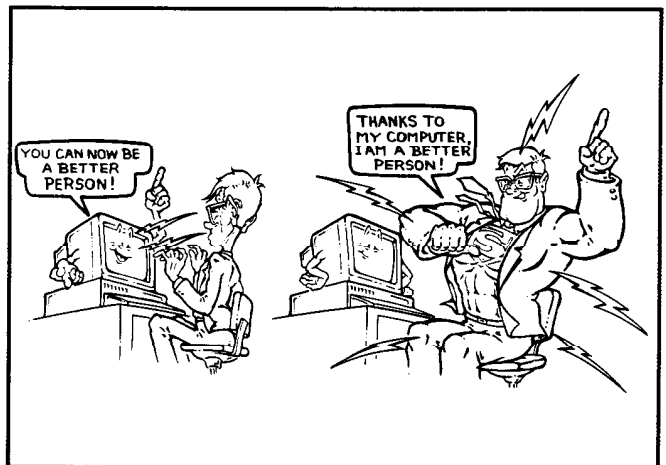
Health & Personal Development Software

Frontier Technologies Inc. has released *Mind Power*, a software program designed to run on all classes and configurations of IBM computers and compatibles. *Mind Power* was developed by a team of Canadian psychologists and physiologists, using the psycho-methodologies of Neuro-Linguistic Programming and Ericksonian Hypnotherapy.

Greater self-confidence, "personal power," and the ability to achieve pre-determined goals easily and effortlessly are some of the benefits users derive from *Mind Power*. Its purpose is to enable users to become less stressful, more relaxed, and able

to rid themselves of undesirable habits or negative feelings. The possibility for change is limited only by the user's imagination or desire to change, whether it is to lose weight, quit smoking, enhance their sexuality, improve their earning potential, or any other goal. *Mind Power* is designed to run without interfering with the computer user's normal, day-to-day computer activities.

Price of *Mind Power* is US\$39.95. For more information, contact Frontier Technologies Inc., 2221 Kenmore Avenue, P.O. Box 59, Buffalo, NY 14205-0059 or circle #64 on your *Reader Service card*.



Got a goal? *Mind Power* can help you get there.

DeskMate 3 Reference Book

Getting the Most Out of DeskMate 3, by Michael A. Banks, is a reference book for the novice as well as advanced users of Tandy's *DeskMate 3* integrated software.

This 300-page reference guide provides the user with information on installation and customization, and advanced tips and techniques on the effective use of *DeskMate's* application and accessory programs.

The book is published by

Brady Books, a division of Simon & Schuster Inc. of New York. Its Radio Shack catalog number is 25-1254 (suggested retail price \$21.95) and is available at participating Radio Shack stores and dealers as well as Radio Shack Computer Centers. For more information, contact Radio Shack, Tandy Corporation, 1700 One Tandy Center, Fort Worth, TX 76102 or circle #67 on your *Reader Service card*.

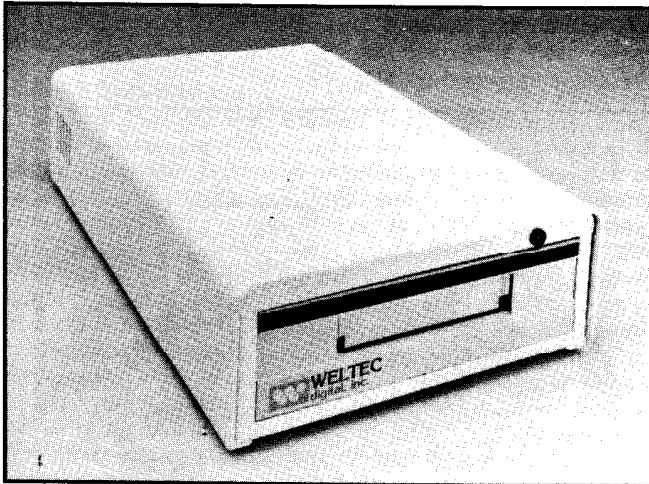
40 MB Streaming Tape Drive For Laptops

Weltec Digital, Inc. has released *LAPBAK 40*, a 40 MB streaming tape backup subsystem for laptop computers. Weltec offers the *LAPBAK 40* in models compatible with Zenith, Toshiba, NEC, Mitsubishi, Sharp, Tandy, Epson, and Datavue laptop computers.

The *LAPBAK* uses the industry standard QIC-40 format and with the use of extra-length tapes the storage capacity can be increased to 60 MB. Data compression is also a feature included with *LAPBAK 40*. Depending on your data type, a

backup of 120 MB can be accomplished. *LAPBAK 40* backs up 2 MB per minute on AT-type computers. A 40 MB hard disk can be backed up in about 20 minutes. *LAPBAK 40* comes complete with intuitive menu-driven software and the necessary cabling for most popular laptops.

List price is \$749.00. For more information, contact Weltec Digital, Inc., 3002 Dow Avenue, Suite 132, Tustin, CA 92680 (714)669-1955 or circle #65 on your Reader Service card.



LAPBAK 40 can back up a 40 MB hard drive in about 20 minutes.

220 Volt Power From Your Car

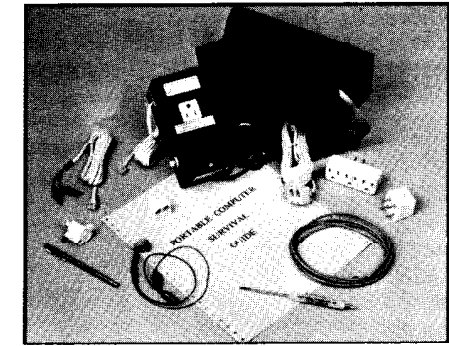
PowerTrip International, from Zirco, runs equipment directly from a vehicle's cigarette lighter to convert electricity from an automobile into normal international house current. Zirco developed *PowerTrip International* for international business people, emergency workers, and service people who work in their cars.

PowerTrip International works with all 220-volt equipment, including popular laptop computers, smaller FAX machines, office equipment, TV sets, video recorders, battery chargers, typewriters and calcu-



Powertrip provides reliable, clean 115 VAC power from your car.

lators. It fits Continental European, British, French and Australian plugs, providing 100 watts of continuous 220-volt AC power.



Portable Computer Survival Kit

Electronic Specialists announced their Portable Computer Survival Kit for on-the-road, on-the-go computers. Gathered in the kit are the essential accessories for hassle-free operation in factories, work sites, offices, hotels, and phone booths.

Featuring the Electronic Specialists Portable AC Power and Communication-Computer Modem Security unit, this kit includes often needed adapters, tools, and cables for the traveling computer. Packed with the Portable Protector in a durable pouch are such indispensables

as screwdrivers, clip-lead modular connector phone taps, RJ-11 "tee" adapter to expand a work-site phone jack into two phone jacks, 4-pin to modular RJ-11 adapter, 25 foot modular-type phone extension cord, AC power 2-prong to 3-prong and triple-tap outlet adapters.

The Portable Computer Survival Kit is available from stock at \$228.95. For more information, contact Electronic Specialists, 171 S. Main St., Natick, MA 01760, (508) 655-1532 or circle #60 on your Reader Service card.

Transmit Data Via Cellular Telephone

Zirco, Inc. has released *DataCell*, a device which plugs

into the connection between the cellular telephone handset and the cellular telephone base to let anyone use any computer or FAX machine with the telephone. Computers and FAX machines plug into *DataCell*'s standard telephone jack. It provides a continuous connection for transmission to remote computers and FAX machines, and protects important transmissions from background noise. Also, it keeps cellular telephone bills low by running up to 30 times faster than older acoustic couplers.

Price not listed. For more information, contact Zirco, Inc., 10900 West 44th Avenue, Wheat Ridge, CO 80033 (303)421-2013 or circle #69 on your Reader Service card.

PowerTrip International features a low-battery alarm, a power switch, a safe power light, and surge suppression as well. These features it shares in common with *PowerTrip*, the American version of the product.

Price not listed.

For more information, contact Zirco, Inc., 10900 West 44th Avenue, Wheat Ridge, CO 80033 (303)421-2013 or circle #68 on your Reader Service card.

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. 1/90

BY Teachers for Teachers: "Grade Management System" Personalized... Stay organized. You set up to: 12 grade values-9classes-50 students. 3.5 inch disk for PDD. Tandy 100/102, 200. We

also customize 5 *BASIC* programs. \$49.00+\$2.00 (S&H). Software by Stef-fens', 1731 William Ct., Little Chute, WI 54140.

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PICO Magazine Back Issues! All 37 available copies for \$39.95. Portable 100, 145 Grove St., POB 428, Peterborough, NH 03458-0428. (603) 924-9455

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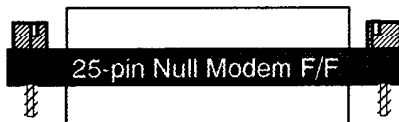
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For free information on products advertised in this issue of *Portable 100*, locate the Reader Service number corresponding to the advertisement that interests you. Circle the number on the Reader Service Card at page 23 (or on the protective mailing 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.

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making sure any extra room on each disk is packed with interesting and fun bonus programs. All files are in .DO format. Ready to load. Ready to go.

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SUPER ROM
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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 ... sur-

passed 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 Think-tank 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.

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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.

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Last chance! If you want *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, **order now.** We've priced these magazines to **MOVE** at the incredible low rate of just \$2, S/H included. The minimum order quan-

tity is \$10.00 (foreign shipping is \$1.50 per magazine for Surface).

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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, *Courthouse 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, *WriterROM, 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, Word-Finder, 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 *Hardware*; University Rethinks its Tasks, Picos in Medicine, *Auxiliary Battery Packs Spell Independence, More Muscle for the M100*.

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

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

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

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

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

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

December: Picos 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-10C, 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 Board **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 Carousel, Popcorn & the Hyperion.

August: NEC 8201 tokens, Laptops in Movie filming, Talking Port **OUT** Reviews of Casio FX-8000G, Tandy 1400 LT, and *System 100*.

September: *English Teachers use Laptops, Picos in Class, D* **OUT** *mples, 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 Lapping, 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 Cassette 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.