

TANDY LAPTOP COMPUTING

OCTOBER 1989 -VOL. 6, NO. 8

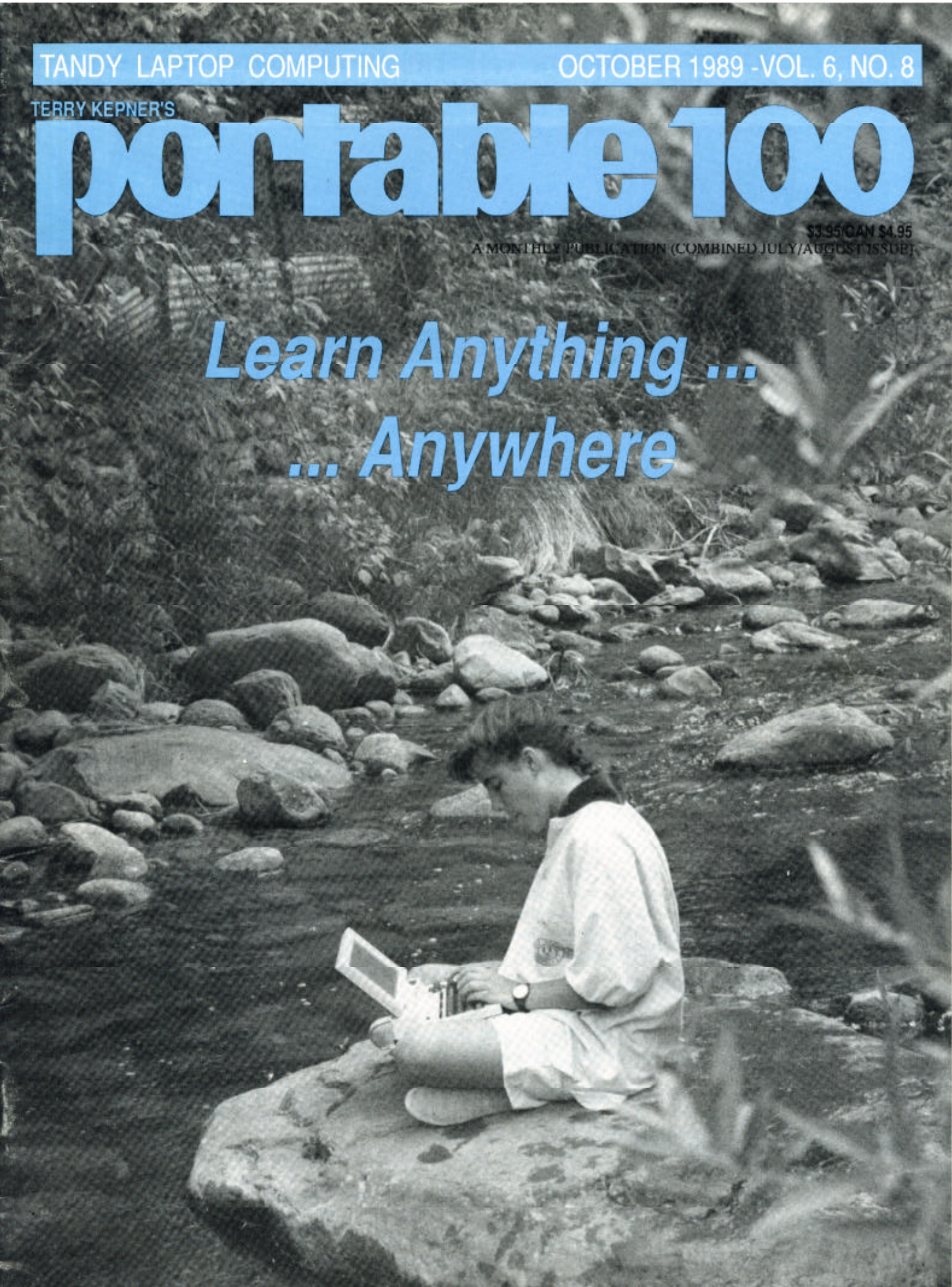
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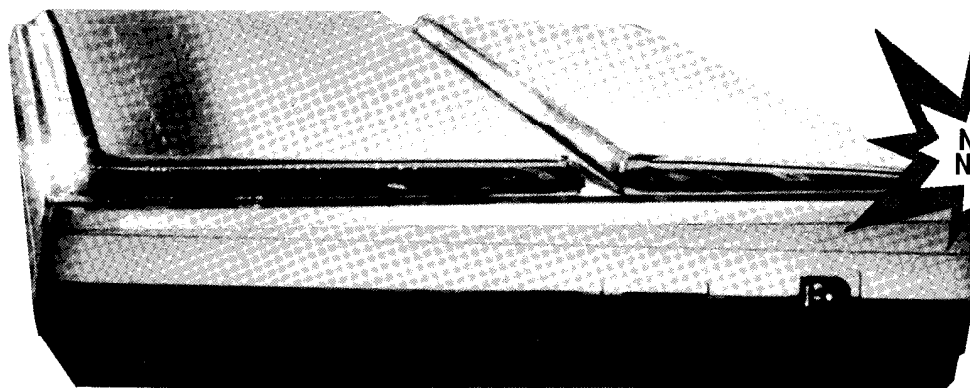


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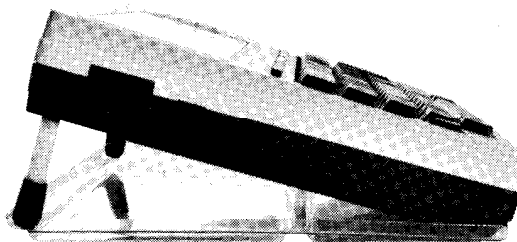
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ADVERTISERS

RS#		Page
35	American Cryptronics	10
158	Club 100: A Model 100 User Group	25
176	Club 100: A Model 100 User Group	17
148	Computer Options Unlimited	28
151	Dyna-Shield	CII
80	EME Systems	19
83	EME Systems	19
85	EME Systems	19
30	Granite Street Portables	27
33	Granite Street Portables	9
115	King Computer Services	1
160	Mel Zwillenberg	23
15	Optical Data Systems	28
66	PCSC	CIII
130	The Programmer's Guild	23
55	Purple Computing	19
88	Rural Engineering	5
149	Selective Software	27
20	Shreve Systems	23
128	Software Versand	23
143	Tony Anderson	25
143	Tony Anderson	19
137	Ultrasoft Innovations	14

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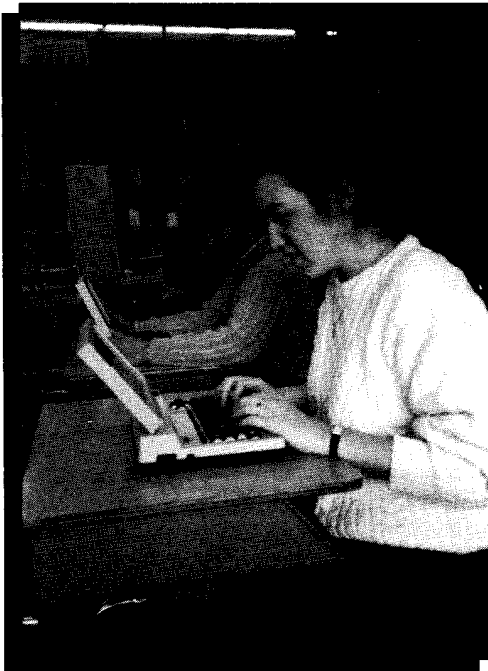
RS#	Manufacturers	Page
61	King Computer Services	20
67	New Pathways	21
64	Optical Data Systems	21
62	Paul Globman	20
63	Toshiba Information Sys.	21
60	Weltec Digital	20

**Don't forget to say
you saw it in
Portable 100!**

**ON
THE
COVER:**

"Back to School" needn't be a drag. Anne Self's Tandy 200 lets her learn where she chooses. With Language Master (in this issue) she can study Spanish or any subject. Here, she's obviously cramming for tomorrow's ichthyology exam.

Photo by Louis Self



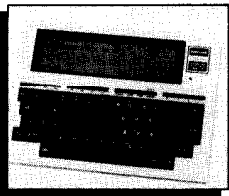
Learning French vocabulary in a more conventional setting.

Inside Photo by Normand A. Leveillee

**LANGUAGE MASTER:
MEMORIZATION MADE
MERCIFUL**

*by Normand A. Leveillee
Flash cards can't beat this.*

8



Tandy 102

DESKTOP PUBLISHING ON THE MODEL 100

*by Candice Norton
Typesetting using a Tandy 100/102 and daisy wheel printer.*

11

ROMBO: A D-I-Y OPTION ROM ADAPTER

*by Stan Wong
Use this new product for fast, inexpensive option ROM development.*

13



Tandy 200

CRDFIL ROM: THE REVIEW

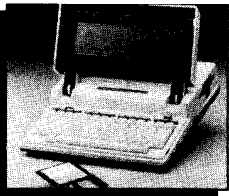
*by George Sherman
A card-file type database system for your Tandy 100/102.*

16

A PORTABLE FOR ALL SEASONS:

TANDY'S NEW 1400HD
*by Bob Liddil
Bob test drives Tandy's newest MS-DOS model.*

18



Tandy 600

DEPARTMENTS

ROM WITH A VIEW

The good ol' rumor mill. 3

I/O

"The usual gang of idiots." 4

THE IDEA BOX

Of magic words and little boxes. 6

NEW PRODUCTS

Surprising developments. 20

FULL POWER

Get the most from TEXT, pt. 3A. 22

DEFUSR

Spreadsheet transfer and more. 24

UTILITY CORNER

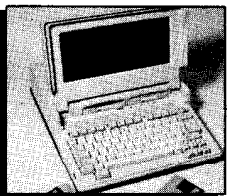
Printing and reading bar codes 26

PORTABLE 100 CLASSIFIEDS

27

ADVERTISERS' INDEX

28



Tandy 1400LT

ROM WITH A VIEW

The Good Ol' Rumor Mill

by Ed Jugo, Director of Market Planning for Radio Shack

(Excerpted from the September 1989 issue of the "Tandy User Group Newsletter," published monthly by the Radio Shack Marketing Information Department)

"It's been some time since we had a bout with this old friend. And most of you probably didn't see this particular example. But the July 10 issue of Computer Systems News carried a small item in their 'INFORMED SOURCES' column, the thrust of which was that we are dropping the Model 102. They also announced that we now have a '25-line machine with two 720K-byte RAM disk drives ...' If this is a really short newsletter, it'll be because I'm rushing to my nearest Radio Shack to find out what it is, and buy one myself!! I am aware of no such machine currently available, or even under development.

"I told CSN we were not discontinuing the 102, and that it was in our 1990 catalog. Will we drop it someday? Sure. Just as someday we will drop every computer we have ... including those not yet announced.

"What I didn't tell them (since it isn't my policy to go into long-term plans with the press) is that the current plan is for the 102 to be around as long as people will buy it. In any reasonable sense, that should qualify as an on-going (not discontinued) product. It has a very loyal following among users, VARs and third-party developers.

"On the subject of the surprise machine with the two RAM disk drives, that must have referred to the 1400 FD, which has two (3.5-inch conventional floppy) disk drives and 768kb (not 720) of RAM. I think CSN's writer just received his formal introduction to the wonderful world of the Tandy Rumor Machine ..."

"... It is quite possible that some rumors—like the one about the 102—are coming from a misunderstanding. I think reporters are picking up on things that happen in Tandy stores in Canada, and translating that into guesses about our U.S. operation. The stores in Canada are operated by InterTAN ... a spinoff from Tandy, but a completely separate company that happens to carry many of the same products you find in Radio Shack stores.

"The truth is, with InterTAN being a separate company, you can expect to see over time, differences in product lines there and in U.S.A. Radio Shack stores. They are free to carry somewhat different, or altogether different products ... even different brand labels.

"So anyone trying to translate Canadian information into U.S. terms is in real danger of placing his or her credibility in jeopardy."

Thanks, Ed! Perhaps that will ease some of our friends' fears that their favorite machines are hurtling toward orphanhood (is that a word?).

Elsewhere in the newsletter, Ed sheds more light on Tandy's new WP-2 word processor. 'Tain't the simple text-only box it might appear. I'm out of space for now, but I must at least mention this: It can accept third-party software! And Tandy is encouraging third-party development. From what I've seen and heard, it could be quite exciting. Stay tuned!

-Nuge

Toolbox

Manuscripts were typed into Microsoft Word 3.0 on a Tandy 1400 LT, 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 2.0a. There they were put into a rough approximation of the magazine's final appearance. Here, pull quotes are placed, headlines, intros, and bylines are sized and positioned, and advertisements positioned.

Next, the magazine was ported over to our Art Director's Macintosh II, using the 1400 LT and

Mac-link. She then went over the publication using Aldus Macintosh PageMaker 3.01, making final design decisions on photo, figure, and listing sizes and placements. She precisely placed the text and added all the little things that go into making a nice looking publication.

Page previews were output from her Laserprinter. When everyone was satisfied with the appearance, the Macintosh disk was sent to Colorite Corp. in Wisconsin for final output directly onto photographic paper. 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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"THE USUAL GANG OF IDIOTS"

As MAD Magazine's Maddest writer, I want you to know I'm MAD about *Portable 100!*

TOOLBOX

The above note was composed on a NEC PC-8201 in the TEXT mode enhanced with the Traveling Software Ultimate ROM II chip. It was uploaded to a NEC PowerMate 386 and then downloaded to the trash basket. It was retrieved and then faxed to California where it was ironed and Express Mailed back to the other end of the line. The document was then loaded into several bank computers, using illegal passwords. Quotes and page numbers were inserted and then removed since no page numbers or quotes were needed. Everything was then uploaded to a Macintosh. (Larry Macintosh, who lives in Peterborough.) Larry then dropped it on Mike Nugent's desk. The rest is history. Imagine trying to do this without the marvel of the computer!

(Mike, I thought your readers might get a kick out of a satire of your TOOLBOX. On the other hand, they might be real annoyed you ran garbage when you could have used the space for something good. Either way, I hope you have a smile.)

Dick DeBartolo
New York, NY

After you "risked your NEC" to give us a laugh, how could we help it? Thanks!

-MN

P.S. Arnie Silverman must be a fellow MAD reader, judging by the following messages he left me on CompuServe over the summer:

04-Jul-89

We have decided to forgo our traditional Independence Day celebrations and do a marathon reading of P100 articles instead. I have lined up two other M100 fanatics who have agreed to read continuously until the next issue of P100 arrives in the mail. We had considered a marathon typing of this material into this SIG but cooler heads, the cost of connect time and a passing familiarity with copyright laws prevailed.

We hope to be entered as the world record holder for P100 readings. We are researching previous title holders.

05-Jul-89

Yes, I agree, we're sick, we have small minds (that's why we have small computers ... or perhaps its the other way around ...). Initially the three of us agreed to come dressed as a Model 100, a M200 and a PDD. When it became obvious that I was perfectly serious (or deranged) about this, the colleague who had offered to play the part of the PDD backed out, and the colleague who had agreed to represent the 200 qualified his position by saying he would only do this indoors (I had planned this for my lawn). Since several people made the suggestion that you did (that I see a therapist), I visited another colleague who works at that trade. When I entered her office, however, she was hard at work on her Mac II. I couldn't even begin to relate this all to someone with hardware like that.

Read, Harken, and Inwardly Digest!

I did, finally, however, begin the reading on my lawn with the August 1987 issue at 1:31 Eastern Daylight Time and read until I filled the 29K available to the Model 100. This took longer than you might think, since my neighbors wanted to know why I had a large piece of oak tag attached to my lawn chair—a piece of oak tag with a keyboard and small screen (my costume). I then phoned my M200 colleague who took up the reading (so he said) at 2:46 EDT. He phone me back at 3:31 to say that he, too, had filled his available RAM.

Without our colleague in his PDD role we were unable to save our files and free up our RAM for further storage. For the record, we exhausted our RAM on page 19 in the second paragraph of the article entitled "A Disk Drive Shortcut ..."

We concluded the exercise by playing the *Star Spangled Banner* on my M102 (USALRM.BA).

Arnie

APRIL FEEDBACK

The April issue was well worth the wait. The new FULL POWER column by Bill Brandon is outstanding, and I look forward to my next issue.

I am still looking for the two May Fools as mentioned in April's ROM WITH A VIEW. I found the "Cray IIa" reference on page 17, but I can't find anything on page 13, unless you are misinforming us about the part numbers for the EPROM's.

In last issue, you gave the answers (or provided a program) for the PUZZLE puzzle for the Tandy 200. What about an answer for the same puzzle in M100 format? I reached my frustration level weeks ago!

I ordered my own Hastbacka plexiglass ISAC cover/stand ("A Standing Project," April '89). Great idea, and the author is definitely entitled to his money!

"Embedded Printer Commands" (April '89) is based on an old (?) Luft PfiEFF article that appeared in PICO a while back. What ever happened to Luft? It might be worthwhile getting him to write a guest column—he is very talented at making the unintelligible simple.

Dan Blanck
Portable BBS

Feedback on Bill and his fellow columnists has been great. We're glad you enjoy them, and thanks for telling us.

The missing jokes are "Cutesy 100" at the bottom of page 13 (a private joke for a friend) and "August 1989" at the bottom of page 24 (no such issue). To the printer's credit, they caught both and called to check with us. By the way, I wonder how many noticed the Tandy 200 we put into the hands of the little Zen guy on the May cover?

We'll ask Paul Globman whether a PUZZLE.100 solution exists. And we agree about Luft's talent. Maybe we can get him to do another piece.

-MN

NOTEBOOK BBS

Announcing 100+, the only public bulletin board system supporting Model 100 graphics and other screen functions. Users describe it as helpful and friendly.

100+ has 11 megabytes of files and it's growing daily. Running at 300/1200/2400 baud (other stats 8N1E) it supports three screen types: M100 graphics, IBM-ASCII, and ANSI color. The software was

INPUT/OUTPUT

designed for PC systems, so expect to spend your first couple of visits learning—with only three menus, that won't take long! A yearly donation is asked for file access, but not a stated amount.

We highly support the "public domain" idea, so help us build on what is already the largest public collection of notebook software. (But please continue to support Club 100 & Portable BBS as well!)

Patrick Ellison
Sysop, 100+ BBS

ATTENTION SUPERFAXERS!

An addendum to my article "Super FAX It with Super ROM" (July '89): Be sure you don't have CompuServe set to run EasyPlex directly when you have mail waiting. This cannot be escaped, even with the Control-P, and will abort proper operation of the PHNE function. If you see anything unusual happening on the screen during transmission, hit SHIFT-BREAK and check with on-line technical assistance to see if any other functions can cause the same problem. Don't worry—the half-sent fax won't be sent to the recipient.

You may want to get back on-line as soon as possible and log off properly, especially if you connect through a network. In my area I connect directly and have never had a problem.

Ronald A. Cameron
Portable BBS

NOTHING TO IT!

JUST DOWNLOADED FOR THE FIRST TIME AND IT WAS EASY. THANKS FOR A GREAT MAGAZINE AND BBS.

IRV SHERMAN
Portable BBS

Congratulations! By the way, feel free to release your CAPS key when on the BBS, so it won't look like you're shouting. (But remember, if you assigned your password in all caps, it will continue to expect that. You can change it at the <H>elp menu.) Welcome aboard, Irv!

-MN

AWW, CHEER UP!

I got my first subscription issue of Portable 100 today. I was happy, but when it fell open to page 24, "Embedded Printer Commands," (April 1989) I was ecstatic! I use a TTXpress portable printer (which I love) with my Model 200, and I was never able to use its power from TEXT. From BASIC, no problem—but not from TEXT. I had, however, a sneaking suspicion that there must be some way to sneak the codes past the SHIFT/PRINT key. THANK YOU LAURENCE J. LAVINS!

* Question to all: Does anyone know of

a screen dump program for the Model 200 and the TTXpress?

(Now I just have to see what is in the rest of the magazine!)

Jim Pitney
Portable BBS

AN OLIVETTI M-10 DOS!

Nuge, I've uploaded two files to the Portable BBS. M10DOS.DO is a "reverse engineered" version of DSKMGR Version 3.02 by J.K. Heilman, and is a BASIC program to reconstruct M10DOS.CO, a disk operating system for the Olivetti M-10.

The other is an ASCII file giving my latest info on the use of the M-10 ROM and RAM. Read, Harken, and Inwardly Digest!

Adrian Ryan
Portable BBS

"Titch" Ryan developed the newly released DEBUG v3.21 for Tandy 100/102 and Olivetti M-10 computers (distributed by Granite Street Portables).

We'll post his new files post haste, so Olly types can also Read, Harken, and Inwardly (as opposed to Outwardly!) Digest, not to mention save and load files on a Tandy Portable Disk Drive!

-MN

*We have small
minds (that's why
we have small
computers ...)*

KUDOS TO COLUMNISTS

Brandon and Brochhagen are excellent.

Raymond D. Weisbond
New York, NY

THE 100 AND PRINTERS

I am very interested in any articles concerning the link-up between the M100 and printers. I am really looking for an article that will give me more information concerning embedded printer codes as described on page 60 in the M100 manual.

Tom Vaughn
Billerica, MA

There was one such article in the April '89 issue. Also see page 20 of the May 1989 issue, Bev Howard's article. That's just for starters. Several others recently appeared. Just poke through some back issues.

-MN

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DOES LUCID DO BARS?

In the January 1989 Portable 100 was an article, "Bar Graphs with MSPLAN." Will it work with Lucid? And the program on page 32 has no numbers—how do you program it?

Peter M. Giglio
Valrico, FL

The listing on page 32 is not a program, but a SYLK file that loads into MSPLAN (see your Tandy MSPLAN manual). As mentioned in a previous correction, the letter in Figure 2 was produced with Lucid and, as you can see, does an even better job than MSPLAN. We hope to have Paul Globman do a followup article on that subject.

-MN

CAR 54, WHERE ARE YOU?

Can you give me an address or telephone number for A&J Micro Drive, formerly of Sunnyvale, California?

Charles L. Redman, Jr.
Fairfax, VA

Nope—I can't. I don't have one anymore, and I have no idea where they went. Can anyone else help?

-TK

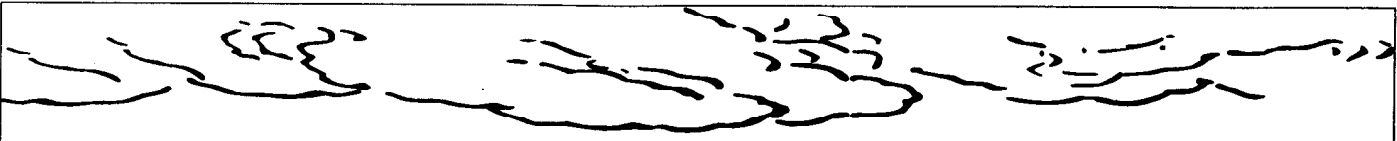
?IO—CORRECTIONS

Shortly after MAD magazine's Alfred E. Neuman was seen lurking around our office, a pair of parentheses mysteriously vanished from line 1 of MAYDAY.100 (June '89, p. 7, Listing 1). The portion of the line reading LEN(F\$) should have read LEN(F\$) instead.

We're making no accusations, mind you, but should anyone know Mr. Neuman's whereabouts, please tell him we'd like to have a word with him. Thank you.

-MN





Of Magic Words and Little Boxes

Dusk. The sky has turned to slate, and a cold hard rain is beating down all the rough edges of the world, washing all the colors away. The landscape has become a black and white photograph, smooth and glossy, re-created in rain-streaked shades of gray.

Next to a full-blown storm, this is my favorite kind of weather. It's perfect for sitting under cover on my front porch with a cup of coffee and a good book. Like most writers, I read a lot. A hunger for reading is the first prerequisite for becoming a writer. But tonight, instead of reading, I find myself sitting on the porch, watching the rain, thinking about the mystery and the magic of writing.

Writing is the most powerful form of communication yet devised by humans. As you read these words, I'm inside your mind, closer to you right now than the person you slept with last night. My thoughts flow directly to you without distraction, something not possible if we were talking face to face, where you might be put off by my spiked purple hair or the Harley tattoo on my forehead or my helium voice or even my harmless preference for wearing my clothes backwards. And writing engages you, forces you to become involved in the process: even as you read these lines, your imagination is working softly in the background, giving voice to my words, giving shape to my ideas.

It is magic. If there are a thousand people reading these words at this moment, then there are a thousand versions of me out there, all slightly different, all unique. And so I write, and you read, and together we create something that did not exist before.

Many of my friends can relate to these things and can understand why I'm compelled to write. Yet few of them, especially those in the computer community, seem to understand my decision about what equipment I write with. They can't believe that I do most of my work on my Tandy 102 (*that's right, I traded in the 200 for a 102; I miss the 200's display, but I like the 102's size and weight*). They find it even harder to believe when they learn

that I've got an IBM XT clone with a 20-meg hard drive sitting on my desk at home. The other day a friend named Dave pointed at my M102 like it was a poodle dropping and asked: "Why do you use that little thing? It's only got 32K. Your IBM's got 640K. Why drive a Pinto when you own a Corvette?"

"It's not quite like that," I explained. "More isn't always better. Who would you rather have sitting on your lap—Connie Chung or Dumbo?"

He saw my point, but he was unconvinced. Maybe I should have made my point another way. Sitting here tonight watching the rain fall, thinking about writing, I see how I could have done it.

Humans have been writing for centuries now. If you had all the pages of text ever written, you could probably line

*Which waves in every raven tress,
Or softly lightens o'er her face;
Where thoughts serenely sweet express
How pure, how dear their dwelling place.*

*And on that cheek, and o'er that brow
So soft, so calm, yet eloquent,
The smiles that win, the tints that glow,
But tell of days in goodness spent,
A mind at peace with all below,
A heart whose love is innocent.*

These words survive because they impart a great truth to us: that real beauty comes from within as well as from without, and that this has always been true. It is a timeless classic of a poem, and for centuries to come it will remain the definitive proclamation of a man's love for a woman.

Typed into a Tandy 102, that poem occupies only 689 bytes.

Think of it—something so potent that, 200 years from now, people will still be reciting it, and it takes up less than 3 percent of the memory available to a 32K Tandy 102.

Have you ever read the *Tao Te Ching*? It's a collection of the thoughts of Lao-tzu, a brilliant man who lived in China long ago. One of the pieces I like most is this:

*Fill your bowl to the brim
and it will spill.
Keep sharpening your knife
and it will blunt.
Chase after money and security
and your heart will never unclench.
Care about people's approval
and you will be their prisoner.*

*Do your work, then step back.
The only path to serenity.*

These words have as much meaning for us today as they did when they were written over 2500 years ago. I haven't studied the lives of either George Gordon or Lao-tzu, but I can guarantee you one thing: neither man needed *WordPerfect* running on an IBM to write the words they wrote.

We tend to put too much faith in technology, to endow our computers with

I'm in your mind.

Imelda Marcos' shoe closet with them. Most writing doesn't survive beyond the lifetime of the author. But some words live on, touching some common thread in generation after generation. These words convey some meaning that remains changeless in an ever changing world.

For example, consider the following words, written almost 200 years ago by a man named George Gordon, better known as Lord Byron:

*She walks in beauty, like the night
Of cloudless climes and starry skies,
And all that's best of dark and bright
Meet in her aspect and her eyes,
Thus mellowed to that tender light
Which heaven to gaudy day denies.*

*One shade the more, one ray the less
Had half impaired the nameless grace*

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talents they simply do not possess. My friend Dave believes his choice of computer and software will make him a better writer. He is wrong. It may make his writing easier, but it won't make it any better. Because good writing, like true beauty, comes from within.

How many examples are all around us? Didn't Lincoln write the Gettysburg Address on the back of an envelope during a train ride? Would it have had any more impact had he typed it out on a Toshiba laptop running *Microsoft Word* from its 60-meg hard drive? Nope.

My T102 will hold all of the Gettysburg Address. It will hold all of the Preamble to the Constitution. It will hold all of Poe's *The Raven*. Or the Lord's Prayer. Or King's "I Have A Dream" speech. Or the lyrics to Joni Mitchell's

"Circle Song." And on and on.

Don't be fooled into thinking you need a bigger machine to do better writing. It just isn't true. If I were writing a novel, I'd want the access to a hard drive that my XT would provide. But, again, that would just make my work easier. Not better. The quality of the work itself would be no better than if I had written it all out a chapter at a time on the T102.

Many of us don't give our Tandy notebook computers the credit they're due. We look at them as a pessimist looks at a glass of water, seeing that it is half empty, not bothering to realize that it is also half full. We live in a world where computers go from "brand new" to "hopelessly outdated" in a handful of months. As a computer enthusiast I'm easily dazzled by all the neat new models and their

fantastic features. But as a writer I try to remember that, in the grand scheme of things, what I *write* is more important than what computer I write on.

The next time someone asks you how you can do anything worthwhile with only 32K, keep these examples in mind. Remember that the power behind the word lies in the person who writes it, and not in the hardware or the software he or she uses. And never, ever forget that it only takes 16 bytes to write those magic words that for centuries now have had the power to transform children into readers, readers into writers, and adults into children again: *Once upon a time ...*

by Michael Daigle

COMPATIBILITY: Tandy 100/102, 200, Kyocera KC-85, Olivetti M10, NEC 8201/8300 (See Editor's Note)

Language Master: Memorization Made Merciful

Parlay this teaching program to your own subject.

by Normand A. Léveillé

I created the *Language Master* to help my French language students learn and master vocabulary. *Learning Master* might be a more appropriate name, however, because with only a few modifications, you can easily adapt it for any subject. Though I'll describe the program in terms of French vocabulary lessons, keep in mind that the lessons could be on mathematics, algebra, chemistry, what have you.

Language Master presents an introductory menu with two choices: *Study* the lesson or take a *Test*. Alternatively, you can press @ (SHIFT-2) to exit the *Language Master* and return to the Tandy 200 main menu.

The *Study* section displays vocabulary words one at a time for a chapter, with the French word appearing first, followed by its English equivalent two seconds later. The student may elect to have these word pairs appear at one of three speeds: each pair every ten seconds, five seconds, or three seconds. After presenting all the lesson items, *Language Master* returns the learner to its introductory menu.

The *Test* section offers two modes: *Practice* and *Test*. Where *Practice* mode presents all lesson items one at a time in the order they were studied, *Test* mode selects 20 words and presents them

Adapt it for any subject.

in random order. In either mode, a student must type the French equivalent of the English word displayed on the screen. After two unsuccessful attempts, the program displays the correct answer. By pressing @ a student can exit the testing mode and return to the introductory menu.

When testing is completed, the program saves the student's name and score in a RAM file named *SMARKS.DO*. If the score is below 70 percent, the program returns the student to the *Study* section for further review.

Should a program error occur, the program records the error number in a file (called *ERROR.DO*), flashes a message, and returns the program to the introductory menu.

USING LANGUAGE MASTER

MASTER.BA (Listing 1) is a *BASIC* shell, or template, into which you *MERGE* lesson material to create a complete, self-contained program for a particular lesson. Type it in, save it as *MASTER.BA*, and store it to tape or disk. You can delete all *REMARK* statements to save 600 bytes.

```

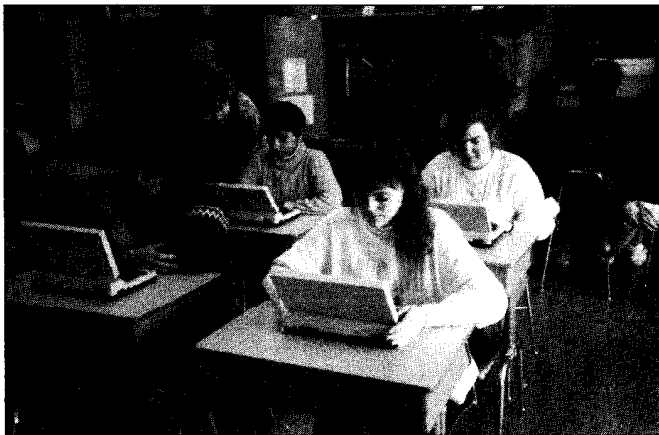
10 'LANGUAGE MASTER (C) 1988 BY NORMAND
A. LEVEILLEE
50 ON ERROR GOTO 20000
100 DIM E$(25):DIM F$(25):DIM I$(25):DIM
N$(30)
110 CLS:GOSUB 30000
200 REM MENU
210 CLS:SC=0:PRINT CHR$(27)"p":PRINT@49
"
220 PRINT@89," Language Master ";P
RINT@129," by ";PRINT
@169," Normand A. Leveillee "
230 PRINT@209," (C) 1988 ";:
PRINT@249," ";:PRIN
T CHR$(27)"q":FOR D=1TO500:NEXTD:PRINT
:
240 PRINTTAB(18-LEN(ID$)/2);"* ";ID$;" *
"
250 PRINT
260 PRINT " 1. Study the lesso
n":PRINT
270 PRINT " 2. Take the test":
PRINT
280 PRINT " -> PRESS <CAPS LOCK> OF
F <-":BEEP
290 PRINT " Type No. & <ENTER>
";:INPUT C$:PRINT
300 CLS
310 IFC$="1"THEN500
320 IFC$="2"THEN1000
330 IFC$="@ "THENMENU
340 IFC$<>"1"ORC$<>"2"ORC$<>"@"THEN200EL
SE350
350 GOTO2000
500 'STUDY
510 CLS:PRINT:PRINT:PRINT:PRINT " T
here are";X;"items to study.":PRINT:PRIN
T:PRINT " Learning speed: 1=slow
(10s)
520 PRINT " 2=averag
e (5 s)":PRINT" 3=f
ast (3 s)"
530 PRINT@525,"PRESS <PAUSE> to STOP Scr
olling"

```

Continued

Listing 1. Using the program *MASTER.BA*, you can create tutorials for your students using a notebook computer.

APPLICATION



Language students in Mr. Léveillé's lab practice their language skills using the programs shown here.

```

540 PRINT@407, "Type No. & press <ENTER>"
;: INPUTN
550 IF N=1 THEN Z=2000
560 IF N=2 THEN Z=1000
570 IF N=3 THEN Z=500
575 IF N>3 THEN Z=100
580 FOR L2=1TOX
590 READ F$,E$
600 CLS:PRINT:PRINT:PRINT:PRINT:PRINT:PR
INT
610 PRINT TAB(20-LEN(F$)/2);F$
620 PRINT:PRINT
630 PRINT TAB(20-LEN(E$)/2);E$
640 FOR D=1 TO Z:NEXTD
650 NEXT L2
660 FOR D=1TO500:NEXTD
670 RESTORE
680 GOTO 200
1000 'Practice/Test
1010 CLS:PRINT:PRINT:PRINT:PRINT:PRINT:P
RINT" PRACTICE all items or take TEST
?" :PRINT:INPUT" P or T & <ENTE
R>";N$
1020 IF N$="P"ORN$="p"THEN 1100ELSE1300
1100 REM PRACTICE in ORDER
1110 FOR L3=1TOX
1120 CLS:READ F$,E$
1130 GOSUB 1800
1140 NEXT L3
1150 IF L3=XTHEN 1500ELSE1500
    
```

Continued

To use *MASTER.BA* you need a lesson file. Go into *TEXT* and type in the lesson material, using *LESSON.DO* (Figure 1) as an example. A lesson file always begins with line 3000, in which *X* gives the number of lesson items (i.e., French-English word pairs, question-answer pairs, etc.), *ID\$* contains the name of the lesson, and *IN\$* contains any instructions to the student. Lines 3010 up to 3200, as needed, contain the actual lesson items in the format: *F\$, E\$* (i.e., French word, English word). Don't forget the comma between *F\$* and *E\$* or the *BASIC* keyword *DATA* on each line after line 3000.

Now, you're ready to create a complete lesson program. Load a copy of *MASTER.BA* into *BASIC*, type *MERGE "LESSON.DO"* (in this example) and press *ENTER*. This merges the lesson material into *MASTER.BA*, creating a self-contained lesson

program. You may now rename it according to your lesson or chapter by typing *NAME "MASTER.BA" AS "LESSON.BA"* (for example) and pressing *ENTER*. Now whenever you wish to study or test on that lesson, just run *LESSON.BA*, and it does everything described above.

In summary, to create a lesson program, make a lesson text file, merge it into a copy of *MASTER.BA*, and rename it. *Voilà!*

OTHER USES

Throughout the program, it was convenient to use variables named *F\$* and *E\$* to represent

French words and English words. However, if you use *Language Master* for math problems, algebra or chemistry formulae, or short questions and answers, you may find it more convenient to change these variable names to *Q\$* and *A\$*, respectively, with *Q\$* replacing *F\$* in lines 100, 590, 610, 1120, 1320, 1850, 1860, and 1890, and *A\$* replacing *E\$* in lines 100, 590, 630, 1120, 1320, and 1840.

The *DATA* in the lesson text file, then, is typed as *Q\$, A\$* (i.e., question/formula/problem, answer/equation/solution).

MISCELLANY

You can change the number of items to be tested at random by changing the value of *L3* in line 1340. Because the random function is not true randomizing, some words may be repeated. Using odd numbers of question pairs and many items helps to reduce the incidence of repeats.

If a program error occurs, return to the computer's main menu and check the file *ERROR.DO* for the error number, which you can then check in the *BASIC* manual or your computer owner's manual for an explanation.

I have 10 lessons of vocabulary for French 1, along with some grammar questions and games. There are eight lessons of vocabulary for French 2, French 3, and French 4, as well as twenty lessons for Spanish 1. If you would like information, please leave a message for me on the *Portable BBS* (603-924-9770) or on *CompuServe* (ID 72327,1025), drop me a note at 319 Sharpe Street, West Greenwich, RI 02816, or call me at (401)397-5948.

Normand Léveillé has been a foreign language teacher (French) since 1960. He has received honors and grants including a National Defense Education Act scholarship to study French teaching in elementary schools (1964), two Providence (R.I.) Journal Grants to purchase software (1986) and a short-wave radio for French broadcasts (1987).

DVORAK KEYBOARD SYSTEM

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from Tri-Mike Network East.

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APPLICATION

and a Tandy Educa-
tional Grant (1988)
for four T200 com-
puters for at-risk,
college-bound stu-
dents in foreign lan-
guages. Most re-
cently Mr. Léveillé
has been selected
Rhode Island IBM
Teacher of the Year
(April '89).

Editor's Note:

Because of
typesetting limi-
tations, French
language charac-
ters in the original
program do not
appear in Listing
1 and Figure 1, but
are available on
the Tandy com-
puters and may be
used.

For the smaller
screens of Tandy
100/102, NEC,
Olly and Kyo
machines, change
the PRINT@ loca-

```
3000 X=30:ID$="Chapitre 1":IN$="Traduise
z en francais...":RETURN
3010 DATA l'affiche,the poster,le cahier
,the notebook,la classe,the class,la cor
beille,the wastebasket
3020 DATA le crayon,the pencil,"l'eleve"
,the student,"la fenetre",the window,la
gomme,the eraser,le livre,the book
3030 DATA madame,madam,mademoiselle,miss
,monsieur,mister,le papier,the paper,la
porte,the door,le professeur,the teacher
3040 DATA la salle de classe,the classro
om,le stylo,the pen,le la les,the,bien,w
ell,"tres",very
3050 DATA et,and,au revoir,goodbye,bonjo
ur,hello,c'est,it is,merci,thank you,oui
,yes,non,no,voici,here is,"voila",there
is,pas mal,not bad
```

Figure 1. LESSON.DO. This file contains the material to be studied, including the questions and answers. You can modify the data in this file to apply to any subject.

tions in lines 530 and 540 to PRINT@ 240 and PRINT@ 280, respectively. As always, NEC users must change all PRINT@ statements to LOCATE and PRINT statements as detailed in previous articles.

Non-Tandy computer character sets differ in some respects. Where necessary, consult your computer's documentation to find alternatives. Files available on GENIE's Laptops RoundTable can make NEC machines emulate Tandy graphics characters.

-MN

```
1300 SEC=VAL(RIGHT$(TIME$,2)):FOR T=1TOS
EC:DM=RND(1):NEXTT:REM *** Test Random
1310 FOR L3=1TOX
1320 CLS:S=RND(1)*X+1:FORI=1TOS:READ F$,
E$:NEXTI:RESTORE
1330 GOSUB 1800
1340 IF L3=20 THEN 1500
1350 NEXT L3
1500 CLS:'SCORE
1510 LET PC=INT((SC/L3)*100)
1520 PRINT@170,"Your score is ";PC;"%":F
OR D=1TO 500:NEXTD
1530 PRINT:PRINT " Type your last name
";:INPUT N$:IFN$=""THEN1530
1540 OPEN "SMARKS.DO" FOR APPEND AS 1:PR
INT #1,DATE$;" ";N$;" ";PC;"% ";LEFT$(ID
$,8):CLOSE #1
1550 IF PC<70 THEN 1560 ELSE 1700
1560 PRINT:PRINT " You did not pas
s! Sorry!"
1570 PRINT:PRINT " Review the items and
retake the test!":FOR D=1TO500:NEXTD
1580 PRINT:PRINT " PRESS <ENTER> to
CONTINUE";:INPUTZ$:IF Z$=""THEN 500ELS
E500
1700 CLS:BEEP:PRINT:PRINT:PRINT "
C(ontinue) or E(nd)?:PRINT:PRINT "
Type C/E & <ENTER>";:INPUT Y$
1710 IF Y$="C"OR Y$="c"THEN 200 ELSE MEN
U
1750 END
```

```
1800 'DISPLAY
1810 T=0
1820 CLS:PRINT:PRINT:PRINT
1830 PRINTTAB(20-LEN(IN$)/2);IN$:PRINT
1840 PRINT:PRINT TAB(20-LEN(E$)/2);E$
1850 PRINT:PRINTTAB(18-LEN(F$)/2);:INPUT
I$
1860 IF I$<>F$ THEN 1870ELSE 1910
1870 IF I$="@ THEN 200ELSE 1875
1875 T=T+1:IF T<2 THEN 1880 ELSE 1890
1880 PRINT:PRINT " * Try Agai
n *":FOR D=1TO200:NEXTD:GOTO 1840
1890 PRINT:PRINT:PRINT " ** The
ANSWER is **":PRINT:PRINTTAB(20-LEN(F
$)/2);F$:FOR D=1TO500:NEXTD
1900 PRINT:PRINT " PRESS <ENTER> to
CONTINUE";:INPUTZ$:IF Z$=""GOTO1930ELSE
1930
1910 PRINT:PRINT:PRINT:PRINT " **
* That's CORRECT ***":FOR DELAY=1TO300:N
EXT
1920 SC=SC+1
1930 RETURN
2000 'ERROR Trap
2010 IF ERR=>1 OR ERR=<60 THEN CLS:PRINT
@246,"PROBLEMS! NOTIFY THE TEACHER!":BEE
P:BEEP
2020 FOR D=1TO500:NEXT D:LET EN$="ERROR"
:OPEN EN$ FOR APPEND AS 1:PRINT #1,ERR:M
ENU
3500 MENU
```

End of listing.

COMPATIBILITY: Tandy 100/102.

Desktop Publishing on the Model 100

An inexpensive typesetting system

by Candice Norton

We normally don't do things this way, but we felt the best way to show how good Hot Zone is was to present the entire review as PRINTED by Hot Zone. The entire piece, except this header, the fancy capital "A" at the beginning, and the italic note at the end, was printed on a daisywheel printer by Hot Zone. The italic words in the middle of the text were printed separately, after the roman text was finished, and then pasted in place. While no Pagemaker, Hot Zone is an impressive piece of work. And it runs on a Tandy Model 100 or 102. Pagemaker won't.

AT LAST, desktop publishing has become available to Model 100 owners — providing they own a Tandy daisy wheel (230) printer and have the full 32K in the Model 100. I can use my disc drive or cassette with this new desk-top typesetting program.

Some time ago, I got a brochure from a friend about a program called HOTZONE, which turns my Model 100 into a professional typesetter! The most amazing thing about it is that it allows me to use virtually any daisy wheel on the market. I can fit all the Qume brand, Xerox-Diablo, as well as the standard Tandy brand wheels on the machine, and the program will translate the non-Tandy wheels for me. (Of course, the program asks me to first enter a "0" or "1" or sometimes a "2" to describe the type of wheel I'm loading into the printer). As a result, I have a choice of many dozens of typewheels, from Olde English to Italic. Also, it doesn't matter if the wheels are regularly-spaced at 10 or 12 or 15 characters to the inch or "proportionally spaced" (to us "pro" typesetters, that means that each letter gets its own proper amount of space — the "i" takes up less room than the "m", etc). HOTZONE will automatically assign to any wheel's letters the proper spacing to make it fit neatly (proportionally) within a word. Just like the type in this magazine.

But that's not all: I can choose any width column for my printout, from 2 inches wide up to about 5 inches. That covers almost any column, from newspaper size to a book page. Of course, the program will justify the column

so each line is flush on left and right sides of the column.

I often took in typing, but until there was Hotzone, I had to refuse all requests for fancy formatting or typesetting. I had a typewriter once that primitively justified typing in columns, but it had no memory or disc drive capacity, and had no editing features such as found in my model 100. I could edit and write in the model 100, but then had to retype the whole thing into my fancy typewriter if I wanted a nice letter-quality typeface that was proportionally spaced and justified as well. What a job!

Plan the space for the picture in terms of its total width and length in inches. If the picture (on a 4 1/2 inch column-width book page, for example) is 2 1/2 inches wide and 3 inches tall, and you want it to appear on the left side of the page, and you want the area reserved for it to begin one inch from the top line, then, if you use your line feed (lines per inch) information, do this: (Suppose you

Sample of Contour-typesetting done by HOTZONE in the instruction manual

Set Total lines (question 3 in chapter III) equal of that particu-

COSTS & FEATURES

I once priced some computer-typesetters with their word-processing software, and it was all above the \$6000 dollar range. So typesetting was out on *my* budget.

But not any more. I have since typeset into columns various kinds of copy ranging from business card and flyer blurbs to magazine and book pages, and all my equipment, including the cassette and disc drive, costs under \$2000. The program itself costs only \$65.

The program gives me many other features, including:

- * Centering;
- * Choice of paragraph indent;
- * Single spacing, double-spacing, and 3 other room-saving squeezed line spacings (2 of them a bit less than single-spacing);
- * Superscript & subscript;
- * Underlining (or italics);
- * Choice of Margin;
- * Vary or reverse line feeds from text symbols;
- * Choice of column lengths/line count;
- * Right side flush (as in Menus);
- * Last minute editing & Stop codes....

All I have to do when I first write is TAB for a paragraph, and hit ENTER at the end of a paragraph. After I edit the text, then I can add an occasional symbol here & there for centering, superscript footnote (or fraction) numbers, and the like. Then I run the program. NO RETYPING!! The columns appear ready for paste-up.

The computer beeps now and again when I have to hyphenate a long word that falls into — you guessed it — the "hotzone." (Have you ever tried to hyphenate "brought?") Even on this score the program allows me a way out of such problems.

I can also format the column width around a picture, a feature I really love. The illustration shows this: See Figure 1, a page from the *Hotzone* manual typeset by the program.

Another item I love is being able to "recall" a line in case I find an error, or if I make an error when hyphenating a word. The line comes back, and I can get it right before printout. I can even add a few words or make minor changes in a line if I wish, using the "new line" last minute editing feature.

For a really professional look, the program creates its own "Italic" file saving the words that were to be underlined. Later you can print these out using an italic wheel (on stickum) and paste them into the text. If you have a whole paragraph to be emphasized, you can put stop codes around it, and then change daisy wheels to another typeface for that paragraph.

The plain english little 55-page manual that comes with the program goes into all the details.

FEW LIMITATIONS

Of course, the program has some things about it that I wish could be different:

My biggest complaint is not even the fault of the program, but is the limited selection of fancy daisy wheel styles. In the *Qume* series, for instance, except for 4 or 5 styles, I'd swear the other several dozen are the same style, just slightly bigger or smaller — all looking like the "stickmen" style on the hammers of the old 1920's typewriters. Some things never change! Why did they keep copying that old typeface endlessly? The same is true even with the modern "courier" style — pretty much "stickmen." Where are the *Times Roman* or *Garamond* styles so beautiful in library books? Surely the daisy wheels makers could have more imagination!

My second complaint is the slowness of the program. It takes, depending on the width of the column, from 10 to 20 seconds for each line to printout. (The computer programmer says that's because the program is in "basic," and needs to be "assembled" or "compiled," something that is not yet available.) However, compared to the time I wasted *re-typing* material into my columns-making typewriter, the complaint is minor. Besides, I can use the time to do paste-up (or proofread the lines as they pass on the screen — and correct them just before printout in the "new line" feature), make calls, read, do art work, eat — or file my nails — interrupted only when beeped to hyphenate.

The program uses a lot of memory, and the copy can be typeset in around 7K clumps, maximum.

The program encounters more beeping requiring my intervention when I try to use all capital letters in the text, or lots of fractions or superscript numbers (in each single line), or try to set columns less than 2 inches wide. But it stumbles through. I guess its isn't "WordPerfect," but I'd call it "Nearperfect" — especially at a twentieth of the price.

For information or copies of the program call or write the originator: Bob Fink, 516 Ave K South, Saskatoon, Saskatchewan, Canada S7M 2E2. (306) 244-0679. He sells the program currently for \$65 (postpaid, including manual), and will answer questions. He sometimes can make specific modifications in the program to suit special needs. Q

Additional Notes: Text can be loaded directly from the Tandy Portable Disk Drive if you have Disk-Power, without loading text into RAM. Without leaving Hot Zone you can stop and search the text on the disk using any key words you want, and load from the middle or any portion of any file. Or text from multiple files. This can also be done with tape cassettes.

The daisy wheel printer (and the condition of its print wheel) you use will affect the quality of your finished print. A good printer with a clean wheel will produce excellent text. An old printer with a dirty wheel will print uneven text and fuzzy characters

COMPATIBILITY: Tandy 100/102, 200.

ROMBO: A D-I-Y Option ROM Adapter

Use this new product for fast, inexpensive ROM development.

by Stan Wong

The option ROM. It's quite a hot topic these days in the pages of this magazine. Over the past few months I've written about several developments that will vastly increase the number of add-in products for the Tandy laptop series and how you can create your own D-I-Y (do-it-yourself) option ROM project.

The ROMBO, from Electronically Monitored Ecosystems (EME), is one of these products that solves the problem of adapting standard 28-pin EPROM's to the Tandy option ROM socket.

These developments are spawning a cottage industry for the Model 100/102/200 market as the larger players move on to the more profitable MS-DOS markets. The programming techniques, development tools, and mechanization hardware for option ROM development have been closely guarded secrets of the large companies. But the veil of secrecy has slowly been lifted with the arrival of several new products over the past year. Look through this magazine and you'll see a several ads for ROM-based products.

Turn over your trusty Model 100/102/200 and open the compartment on the bottom. You'll see two empty sockets staring back at you. The small rectangular one is the option ROM socket. You may have already purchased a commercial ROM product such as the *Super ROM* or the *Ultimate ROM II* (which Traveling Software is discontinuing). That space is no longer the exclusive domain of the large software houses. You, too, can create your own option ROM programs.

The newly announced ROMBO from EME lets even the klutziest person mechanize his or her own option ROM. This is important for people like me who have no problem writing software but fall into the "hardware hopeless" category.

WHAT ARE OPTION ROMS?

The option ROM socket gives your

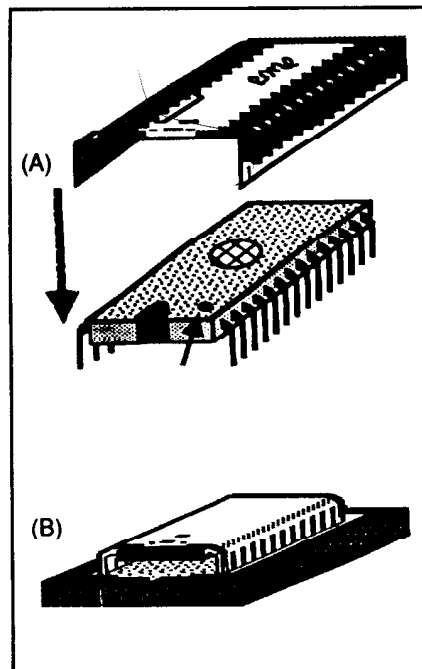


Figure 1. (A) The ROMBO fits over a standard EPROM. (B) This inexpensive fiberglass circuit board re-routes the pins on the EPROM to conform to Tandy's option ROM socket.

little lapper up to 32K of extra code space. Currently the number of commercial offerings that take advantage of this feature is very limited.

Technically speaking, this additional 32K doesn't come easy. The 32K address space is shared with the M100/102/200 system ROM, the one that holds *BASIC*, *TEXT*, etc. It does this by a technique known as bank switching, the responsibility of the option ROM programmer. If he needs to call a system service routine, like sending a character to the printer, the ROM programmer has to perform a complicated setup to get to the system ROM and back again.

Mo Budlong documented these pro-

gramming "secrets" in his book *Secrets of ROM Revealed*, or *SORR* for short, (reviewed in April '89), oriented to assembly language programmers. But you haven't seen a stampede of programmers rushing to develop assembly language option ROM programs, probably because King Computer Services (KCSI) has released the *RBASIC* compiler (reviewed in the July/August/September '89 combined issue), which compiles any *BASIC* program into option ROM form.

DEVELOPING AN OPTION ROM

Okay, so you want to be an option ROM developer. Don't know how? Well, Chef "Skateboard" has the answer. An option ROM recipe might look something like this. Take one part software and add two parts hardware as follows:

1. Write an option ROM program.
2. Program an EPROM.
3. Adapt the EPROM to the Tandy socket.

Step one involves writing a program either in assembly language or in *BASIC*. Follow the techniques in *SORR* if you are writing an assembly language program, or use KCSI's *RBASIC* compiler.

Here I won't cover Step Two, programming an EPROM, but it is a fairly simple process if you have the right equipment. See the "Book of Revelations" article (April '89) for more details.

Step three is what this review is all about.

Okay, you're a power programmer. You've read Mo's book. You've written that "killer app" (as in application) that's going to blow away the competition. But, oh, just one more small detail: No EPROMs fit the option ROM socket! (See the April review's sidebar, "What's an EPROM?") The option ROM socket is electrically as well as mechanically different from standard EPROMs. The pin arrangement of the socket is made for a custom mask-programmable ROM (see April '89 sidebar). Mechanically it is

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made for a Molex-type carrier rather than the normal pin-socket arrangement of standard integrated circuits. So traditional solutions to this problem have been quite complicated. (See this review's sidebar for more details.) ROMBO, however, is an elegant and simple solution to a complex problem.

USING ROMBO

Having successfully completed the first two steps, you should be holding an EPROM that contains your killer app. Mounting it in the option ROM socket is simplicity with the ROMBO. Here's my experience with the product.

I started with an ordinary BASIC program, ran it through the RBASIC compiler, and programmed an EPROM. Then I took my EPROM, slipped the ROMBO over it, being careful to line up pin 1 on the EPROM with the "1" marked on the ROMBO, as illustrated in Figure 1-A. I put the supplied spacer on the bottom and fastened the ends with some clear adhesive tape.

I backed up all the files in my M100, turned off the power, opened the option ROM compartment on the bottom of the machine, held my breath, and plugged the ROMBO assembly into the option ROM socket (Figure 1-B). I turned on the power and accessed the ROM. It worked! I was stunned. After I started breathing

again, I sat there for a minute to assess the implications of this device.

THE IMPLICATIONS

In ten minutes I had mechanized an EPROM for the option ROM socket. And I was taking my time to follow the instructions and make sure I had everything right. I didn't want to blow up my computer with a wrong move! With some practice, assembly time should be on the order of one to two minutes per device. With the ROMBO you don't even have to know which end of a soldering iron to hold (I'm still learning though ... and have the scars to prove it).

This implies that anyone with a good idea (and a bit of work) can bring an option ROM product to market. You don't have to be a large company with specialists in arcane computer technology to succeed. Mark my words. The cottage industry is about mushroom.

A REVOLUTIONARY PRODUCT

Indeed it has occurred to me that with an MS-DOS laptop, RBASIC, ROMBO, and an EPROM programmer, you can modify a BASIC program, create and install new ROMs—all while in the field. This could open up a whole new application arena (as well as create new problems).

To remove the device simply pry up

REVIEW

on the ROMBO adapter. Although not mentioned in the documentation, I found that it helps to fasten a piece of ribbon to the bottom of the EPROM. Cut it to about twice the length of the device. Let the ends dangle outside the option ROM socket when installing the device. To remove the device grab the ribbon ends and pull up gently, using a slight side-to-side rocking motion.

It's that simple! For a more permanent installation you can solder the ROMBO to the EPROM. This would, however, defeat what I consider the main advantage of the ROMBO: reusability.

INSIDE ROMBO

Conventional option ROM adapters consist of a rigid board with holes for the EPROM pins. Copper traces on the board re-map the pin arrangement of the EPROM to conform to the pinout of the Tandy option ROM socket. Grooves machined into the side of the board accommodate the Molex pins that reside in the socket. The entire arrangement is essentially a very small printed circuit card typical of those found in most computers and other electronics.

On the other hand, ROMBO is made from a new bendable circuit board laminate, called "bendflex." The material is an epoxy-fiberglass laminate, but the fibers are shorter than in conventional circuit board material, and the epoxy has more "flow." It bends.

Laminated with a ductile copper, it can bend into a radius less than 10 times the board's thickness without danger of cracking the laminate. The copper retains the shape of the bend; the epoxy-fiberglass just follows along.

Products Mentioned:

ROMBO—\$10.00
Electronically Monitored Ecosystems
2018 Parker St.
Berkeley, CA 94704
(415)848-5725

RBASIC Compiler—\$299.95
Secrets of ROM Revealed—\$39.95
(\$49.95 w/disk)
King Computer Services
1016 North New Hampshire
Los Angeles, CA 90029
(213)661-2063

ROMX-2XL EPROM Emulator
CTek, Inc.
P.O. Box 2310
Bay St. Louis, MS 39521-2310
(601)467-8048

The placement of the copper conductors is tricky, because of the mechanical design restraints from placing conductors near the bend.

EME was unable to find a manufacturer to produce a small quantity of prototypes, so they went ahead, undertook the risk, and placed a large order to make small quantities available to developers, experimenters and hobbyists. EME has since received at least one large order for more than 100 pieces from a large corporation that uses 100/102s for field applications, migrating their BASIC application to option ROM, using KCSI's RBASIC and the ROMBO.

ABOUT EME

EME is a small firm whose main product is the On-site Weather Logger, or the OWL, developed for field biologists and others who need to collect data about micro-climate and related variables. A Tandy 102 monitors various sensors, measuring such factors as temperature, moisture, and light levels, and then rec-

ords this data in the computer's RAM memory. Since the system must run unattended in the field for long periods of time, the maximum amount of RAM must be available for data recording.

Thus ROMBO was born of necessity. They converted the data-logging software to an option ROM program using KCSI's RBASIC compiler. And they created the ROMBO to adapt the resulting EPROM's quickly and inexpensively to the Tandy option ROM socket. This meant that they could reprogram and reuse the existing EPROM, saving money and time, both precious commodities these days.

SOMEWHERE OVER THE ROMBO ...

The ROMBO device is an important development for the option ROM cottage industry already springing up in M100-Land. Its key benefits are the reusability of EPROMs and the ease of installation.

ROMBO's appeal is that it can be used in the prototyping stage, as well as in the production phase of a product, and on

into the maintenance phase as well.

I feel that one of its markets is the small option ROM development concern, which should be the majority of the option ROM market these days. Corporations with BASIC applications are another target market. Armed with RBASIC and the ROMBO, creating an option ROM application is within the capabilities of many people and organizations. With Traveling Software exiting the M100 market, that leaves only PCSG mass-marketing an option ROM application.

For the small developer this means new market opportunities. For them lies a potential pot of gold at the end of the ROMBO.



Stan Wong is a programmer in the Defense Electronics industry. Working with the Model 100 is his hobby—not riding skateboards. He is a frequent contributor to Portable 100 until Nuge can think of how to remedy the situation. Until then, please bear with us!

Adapter Alternatives

You can choose from several alternatives to using the ROMBO device. Some of the devices are available only to commercial manufacturers, and some are exclusively licensed, however. Contact the manufacturer for more details.

TANDY EXPANSION ROM/BOARD CONVERSION KIT

Tandy sells an adapter board onto which you solder your EPROM, then plug the circuit board into the option ROM socket. The Tandy device has been the only device available to the hobbyist for many years. It is essentially a small printed circuit card that re-maps the EPROM pinout to match the Tandy Molex socket. The kit comes complete with the adapter board, spacer, and even the little "pull" ribbon used for removing the ROM from the socket.

To use the Tandy option ROM adapter you have to solder the EPROM to the circuit board. Other than being extremely labor intensive (28 closely spaced pins—be careful of solder bridges!) the part can't easily be reprogrammed to correct bugs or to install and update. You must discard the board and the EPROM at a cost of about \$20 for the materials alone. You could salvage the setup if you are equipped with desoldering tools—and you could build a jig using a 28-pin test clip that will also let you access the

EPROM—but all that is difficult at best.

The copper traces are reportedly prone to lifting off of some of the circuit boards when heated during the soldering process. I have not had this happen, although I've used a only few of these boards myself.

You can obtain the Expansion ROM/Board Conversion Kit from Tandy National Parts Service. Call (800)442-2425 or (817)870-5662 and order part number AX-7113. The part costs \$10.02.

KING COMPUTER SERVICES, INC.

In response to the trace-lifting problem mentioned above, KCSI makes an industrial-strength version of the Tandy adapter.

KCSI also makes an industrial version of the ROMBO, wherein they modify the ROMBO to include a Molex carrier, along with other modifications to make it "industrial-strength." It's unclear to me what the cost/benefit tradeoffs are, but for industrial customers a few more bucks is worth the peace of mind.

POLAR ENGINEERING AND CONSULTING

PEAC makes an adapter that looks like translucent plastic with copper conductors on both sides. The unit wraps around the EPROM and mounts onto a plastic carrier. The *Ultimate ROM II* uses

the Polar wrap.

Using them is not easy, though. Wrapping the adapter tightly enough around the EPROM so that it makes reliable contact is difficult. Once on, however, they are very reliable. In any case, Polar wraps are not available to the general public. Traveling Software has an exclusive license and does not make them available.

OTHER OPTIONS

EPROM emulators can make the job of testing an option ROM program easier. These devices plug into a 28-pin EPROM socket at one end. The other end has a serial port connection. You download your program from your PC into the EPROM emulator. Your M100 then accesses it as if it were a normal EPROM. You can use the ROMBO to adapt the 28-pin header on the emulator to the Tandy-style Molex socket.

With this, you can save your option ROM socket from many insertion cycles during program development. Time, though, is the major savings. You don't have to program, insert, extract and erase EPROM's with the emulator.

I have not used any of these emulators, but there is no reason why they shouldn't work for option ROM development. The ROMX-2XL EPROM Emulator from GTEK is one such unit I have seen advertised.



COMPATIBILITY: Tandy 100/102.

CRDFIL.ROM: The Review

This "card-file database system" can be your ace in the hole.

by George Sherman

Late in 1987, Tony Anderson, a SYSOP (systems operator) on the Model 100 Forum on CompuServe, and a frequent contributor to its libraries, whiled away a weekend with a little mental exercise. He wanted to see if it was possible to create a program that could create any number of data files based on a "card" concept. He was amazingly successful. The result enabled the user to set up his own *template*, like a 3 by 5 or Rolodex™ card, the size of the Model 100 or Tandy 200 screen, and which could then be used repeatedly to enter information into a data file. He made the weekend exercise available through CompuServe's M100SIG, and it was an instantaneous success.

I first downloaded CRDFIL.BA in early 1988, and it has remained my absolute favorite M100 program. I use it for everything. My cards run from simple two-prompt cards to cards with fourteen prompts. My files run from less than 1K, to one weighing in at over 14.5K. I have kept track of my taxes, my Christmas card list, my class roll, my company's stock room, my medical bills, and more. Several other M100SIG members contributed support programs to do such operations as printing, editing, and sorting the information contained in the CRDFILs. Tony himself wrote several others, which included two different printing programs, a new and easier template maker, and an amazing totaling program.

THE CREME DE LA CREME

Tony has now combined the best parts of his programs, as well as programs

written by Charles Lewis and Bob Craft into an EPROM, purchasable from him. This is solid software at a reasonable price and is the first new ROM-based product to become available in about two years. It appears to be the start of a whole line of low-cost, no-frills ROM products. In addition, Tony has added many features not available in the original versions. For instance, with CRDFIL.ROM, it is possible to copy information from a previous card by a simple press of the ESC key, in effect creating a temporary macro. An-

```
Product: CRDFIL.ROM
Company: Tony Anderson
Adrs1: P.O. Box 60925
Adrs2:
City: Reno State: NV ZIP: 89506
Comment: CRDFIL.ROM is the first major
M100 ROM software release in two years
```

An example of a CRDFIL entry.

other nice feature is the ability to concatenate, or join, two fields into one while a file is being printed. As an example, you could join "John" to "Doe" from two different fields making the output "John Doe." Or you could combine city and state into one entry.

With CRDFIL.ROM you can create your own form in any arrangement you choose. Or you can use one of the 20 templates given as examples in the accompanying manual. The examples cover a wide range of interests from managing a CB log to organizing income tax records. If you later change your mind, you can also correct or rearrange your form as long as you don't change the number of prompts. You can "thumb" through your cards looking at all of them or a selected set keyed on a word or words and/or numbers. You can total up to 7 numerical fields at once on the 100/102,

or 15 on the 200. When you use this feature you see all the totals running up, all at the same time, until the run is complete. As I said before, simply amazing. I used this feature to compile, total, and print out my 1989 income tax information. (My tax consultant was favorably impressed.)

You can sort by three different sort methods: an absolute alphanumeric sort, a relative alphanumeric sort, or a straight ASCII sort. Depending on how you have arranged your lists, you can sort on any field, and print lists based on that sort, without destroying the original file.

Or you can produce an entirely different file. You could, for instance, sort by ZIP codes, names and/or addresses, or important dates, and set up a separate file extracted from the original for business contacts, birthday cards, a Christmas card list, and on and on. Another thought is a schedule card file that would include dates and times of various events, which could then be printed in date/time order and constantly updated with new information to become a to-do file.

With the printing modules, you can print mailing labels, make index or Rolodex cards, or print lists of data in columnar form. This latter format is my favorite. I recently put my entire small stock room of over 300 parts on CRDFIL. My template includes part number, location, description, minimum quantity (the point at which I reorder), and the number of pieces per pound. I sort three different ways, and print out each sort in columns. One sort is by part number, another is by part name (it's amazing how many em-

REVIEW

ployees do not know the part number), and the last is by location. Each printout is used by many different people and for differing reasons. But all the items (part numbers, descriptions, and the like) arranged in vertical columns make that much easier, whatever purpose I use the printout for. The ability to list the data in any order is a very nice feature.

THE DATA MANAGER

With the data manager, you can create data files that you can output to RAM, the printer, disks, cassettes, or the COM port for transmission to other computers. *Data Manager* also allows you to output data to a file that you can use with other programs or to generate reports.

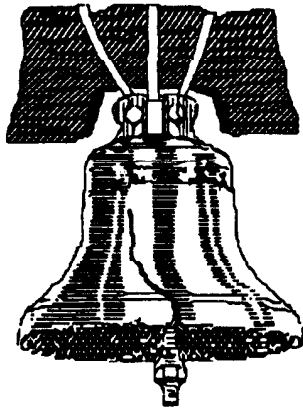
I previously mentioned that you can change or rearrange a *CRDFIL* template. The editing portion of the program also allows editing of the information on the cards. Again, you can edit all cards, or a selected number. This is handy to change information, such as paid bills or quantity or address changes. In other words, this program is very usable. You may delete old or out-of-date cards from the file, making it ideally suited for a file where you're constantly changing or deleting data after completion.

My EPROM arrived mounted in a

*My tax consultant
was favorably
impressed.*

ROMBO adapter from EME Systems, or carrier, because of the differences in the standard pinout and the Molex carrier used by Tandy. Installation was simplicity in itself. I opened the door on the back of my M100, removed a spreadsheet ROM I had installed there, and inserted the EPROM in its place. Then I went into *BASIC* and typed *CALL 63012* and *CRDFIL* began running. I returned to the computer menu, and there was *CKDFIL*, installed and ready for use. If you have Traveling Software's *Booster Pak*, P.G. Design's *SAFE ROM bank*, or P.C.S.G.'s *6-ROM bank*, all you need is the *CRDFIL.ROM* without the carrier.

The words *user friendly* have been overworked, but this aptly describes the program. Screens are clear and easy to use. In most instances the program requires that you depress either a letter or a number key to choose an option. After a



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module has been chosen, the program takes the user step by step through the routine necessary to set the module up to achieve the desired end. It also supports disk operations such as *TS-DOS*, *Power Disk* or *Power DOS*, and *Disk Power* as well as the *Chipmunk* and *Tandy's D/VI* disk drives.

I must comment on the operating manual that accompanied the EPROM chip. This is without exception the easiest, the clearest, and the best organized manual I have ever seen or used. Tony's method is simple. Screens are shown as they appear to the user. Following is an explanation of the screen and the choices available. After each choice is the page number to turn to that explains the choice. If the choice produces another screen, or takes you back to the opening screen, Tony gives you the page number on which that screen appears. What happens on the screen as you go from choice to choice is exactly what happens in the manual as you go from page to page. As I said, without exception, the most organized manual I have ever read. (Tandy, are you listening?)

I have explored several so-called "card file" and inventory programs for my PC. I have yet to find one that is as simple to use, as flexible, or as useful as *CRDFIL*. And the fact that it runs in ROM, and uses no RAM space, leaving all my

RAM for data files and program operations, is great.

Oh, one final comment. Tony has hidden a secret program on the chip. At the opening screen, pressing a *Q* or *q* turns the sound off for silent running, pressing a *Z* or *z* runs through the sounds used in the program, pressing a *V* or *v* gives the version number and information about the program manufacture. Pressing the secret key pops up the hidden program. It has no connection to the *CRDFIL* series but is, nevertheless, a very handy little program. I am not at liberty to tell you what it is or how to find this secret program because Tony has nixed that idea. So all I can do is wish you much suXXess in finding it.

-BY GEORGE!



Manufacturer's Specifications

CRDFIL.ROM—\$59.95

(price for standard pinout EPROM)

Mounted on carrier board to fit

Tandy's Molex socket: \$74.95

Card-file database system

Tony Anderson
P. O. Box 60925
Reno, NV 89506

A Portable for All Seasons: Tandy's New 1400HD

*Their new HD and FD computers are complete reworks of the older LT.
Some things are different, some are the same.*

by Bob Liddil

Tandy's workhorse laptop, the 1400LT, now has a Clydesdale new brother. The 1400HD (for Hard Drive) incorporates the same rugged outer shell, improves its portability, and adds a twenty megabyte hard drive for those of us (and we are many) who simply *must* carry every program and file everywhere we go. Full IBM compatibility allows the use of anyone's software anytime. The dual-speed 4.77/8.0 MHZ 16-bit V20 CPU chip lets you choose the appropriate processing speed for a specific application. The 640K RAM/128K Ramdisk combination is useful, as is the built-in CGA graphics support, printer and RS-232 support (no adapter cards needed). Its 720K 3.5-inch floppy drive creates an excellent real world interface, as does a rear panel connector to accommodate an external 5.25-inch floppy drive. A full 76-key XT keyboard and indicator lights for various

functions blend into comfort and style on an airplane when work needs to be done. And oh, brother, two things stand out almost immediately when cranking this baby for the first time—the video display and that hard drive!

When switching over to the 1400HD from my former machine, an Epson Equity LT, the most striking contrast between two supposedly similar machines was the brilliant clarity of the 1400's screen display. The Tandy's backlit dark blue letters on light blue background are legible at virtually any screen angle, a blessed relief from the black letters on olive drab screen of the Epson. Whether viewing documents or game-generated screen graphics, the 1400HD display blew the competition away.

The hard drive is a masterpiece of silence. Its initial soft jet whine on start-up gives way to virtual inaudibility during operation. More than 20.5 megabytes

of available storage greeted me upon bootup, already formatted and ready to accept whatever data/programs I might want to add.

To test ease of operation, I initialized *Electric Pencil*, the archaic but beloved word processor of my choice, and began typing this review. The differences between the FD (Floppy Disk) and HD versions of this machine don't manifest themselves overtly. In the passenger seat of a Camaro, with a teenager at the wheel, either fits well in my lap to accommodate whatever story I happen to be working on at the moment. But being able to drop down to drive C to access a thesaurus program (too large to reside on the *Pencil* disk with files there as well), the dictionary, or even other programs, well points up the convenience of not having to change diskettes all the time. The driver's love of full-throttle curves, coupled with the Camaro's hard suspension, spotlights

Techie Details That Matter

The new Tandy 1400 HD is actually from an entirely different manufacturer than the 1400LT was. This obviously presented some problems for Tandy. Their solutions, while logical, cause some disturbing, and in some cases delightful alterations.

The most important, but least likely to be noticed by most people, is that the power supply that comes with the HD uses a *center-negative* plug! The 1400LT uses a center-positive plug. And, yes, both plugs fit into both computers. As to whether inadvertently plugging a 1400LT power supply into a 1400HD, or vice versa, will cause either power supply or computer to blow a fuse is unknown at this point. Fortunately, the two power

supplies are physically different in appearance, so you won't accidentally switch power supplies (the LT unit itself plugs into the wall, the HD unit is a solid unit with two cords: one for the wall socket, the other for the computer).

This leads to the next difference: batteries. The 1400 LT uses 10 C-cell NiCd's in a wrapped package rated at 10 volts and 2200 milliamps. The HD uses a set of four D-Cell NiCd's rated at 5 volts and delivering 4400 milliamps.

Close examination of the cage that holds the floppy and hard drives revealed that the HD has slightly larger gaps on the right and between the two drives, leaving insufficient room on the left for the older LT battery pack. This,

naturally, means that the power supply has been redesigned to accommodate the new voltages. Sitting atop the new internal power supply is a VERY quiet fan. Vents have been added to the back plane to assist the fan.

Another new feature is the design of the option card slots at the rear. The one on the right is still a modem slot (and accepts all the current 1400LT modem cards), but the one on the left has room, and connectors, for TWO cards. The top space is reserved for the hard drive controller, which uses special surface mount technology to decrease the space used to half of what it used to require. This leaves the lower half of the slot unoccupied. Thus, it is possible for someone to design

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P.O. Box 60925
Reno, NV 89506

Circle 143 on reader service card.

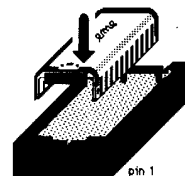


Three products for
your 100/102/200!

EXTRAM is a 32K byte read/write memory expansion that slips into your Tandy's internal option ROM socket. It taps into the Tandy's backup battery, drawing less than 1µamp standby current. Use EXTRAM as:

- second 32K system memory.
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Includes complete documentation. It's like having two computers in one, and you are still 100% portable!



EXTRAM fits into the option ROM socket in the 102/100/200. A 2-pin plug connects EXTRAM to battery and WR lines. It's a snap to install in the 102, slightly harder in the 100/200.

EXTRAM... \$75 ea. postpaid (US) + tax (CA).
(Circle 83 on reader service card)

another point about this portable hard drive: Bumps or platform instability do not seem to faze it. A pothole-filled New Hampshire road did not interfere with the typing, although I must admit that downtown Boston expressways—with the kid driving—did. (But that was me, not the computer.)

Rather than pad this narrative with tons of techie doubletalk, I'll sum up my impressions from a strictly user's point of view. The keyboard is comfortable. I type two-finger style, and this keyboard doesn't interfere with that. The display is magnificent: well lighted, well contrasted, easy to read, terrific. The hard drive just is. It's there with megabyte storage, speedy enough access for my uses—dictionary, thesaurus, public domain pinball—all there at my fingertips without lots of disk changing, but the 3.5-incher is also there for outside access

when I need it.

Overall, I like my new 1400HD. It is a writer's dream machine, light in weight, compact in size, easy to carry around, and an instantly-recognizable unit on commercial airliners. I've never been turned down when I've asked permission to use it during a flight (though I suspect they'll take a hard look at it overseas). Its speed and versatility should equip it well for engineering, accounting, and other high volume applications, which I believe it will handle with the same efficiency as it handled the spell-checking for my new fantasy short story, "Fred the Zombie Butler."

And that's what a computer should be—something that is only barely consciously employed. Like a good pair of sneakers, I know my 1400HD is there, but I just use it. I don't even think about it twice.

and market a card for this second option slot (say, an extended one or two Meg of memory). How about that! You get a hard drive computer, still with two slots available. We don't know if the FD will offer both left-side connectors, but if it does that means the FD could accept two option cards instead of the LT's one.

Other details are: the sound volume control has been moved from underneath the battery to beside the ON/OFF switch; there is still an 8087 slot available (there's also another empty, unmarked chip socket nearby—wonder what goes there?); the new HD is dimensionally the same, but about two pounds lighter than the LT (11.5 vs 13.5 lbs); and the display is brighter and provides better contrast

than the LT offered.

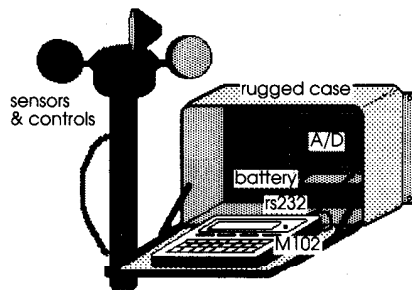
Now for the hard drive specifications: 11.4ms track seek time, with an average 70.1 ms on random testing. It has 2643 rpms, with a random data transfer rate of 58.1 KB/S (for an effective rate of 128.8 KB). The interleave is three, although an interleave of one would increase the effective rate to 187.8 KB)

Finally, the Tandy 1400 HD appears to be a modified version of the Grid 140XT (although on the Grid the drives face sideways). Or perhaps the Grid is a redesign of the 1400LT. In either case, the manufacturer is Sanyo.

ROMBO is a reliable, economical adapter that allows you to use stock 27C256 (or equiv.) eproms in the M100/102/200's option ROM socket. It fits like a sleeve over your eeprom.

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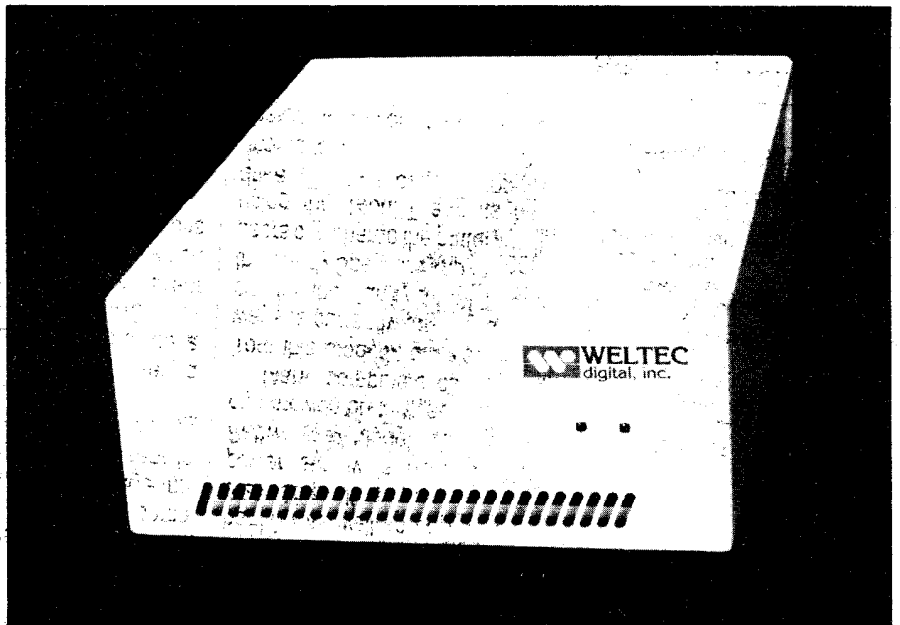
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Portable Hard Disk for Laptop Computers

The PHD (Portable Hard Disk) has been released by WELTEC Digital, Inc. The 20-mega-byte PHD is battery powered, and is designed for PC-compatible portables and desktops. It uses the RS-232 port and boots off the supplied floppy disk. No additional hardware and no expansion slots are necessary.

The PHD runs for two hours on a single charge, and has a time-out utility for extended battery life. A serial cable, battery charger, and PHD boot disk are included. The PHD carries a one-year warranty. List price is \$1,099.00. For further information, contact WELTEC Digital, Inc., 17981 Sky Park Circle, Bldg. M, Irvine, CA 92714. Or circle #60 on your Reader Service Card.

The PHD is a battery-powered 20-meg hard drive for PC-compatible laptops.



Model 100/102 Application Notes from King

King Computer Services, Inc., has released a *Technical Notes* series, aimed at developers and software houses working on the Tandy Model 100/102. The series is not limited to any computer language, though many of the routines are written in assembly. They cover a wide range of Model 100/102 activities with detailed technical explanations and samples of code. They are distributed in printed form and on an MS-DOS formatted diskette. Some of the "Technical Notes" available include the following:

- *Serial 64*, an assembly-language routine to install hooks in the operating system. The user may then create an alternate serial buffer of any size to bypass the limitations of the 64-byte buffer currently used by the Model 100/102.

- *TEXT Call*, a very popular set of notes that allow a BASIC program to call the M100/102 TEXT editor, edit a file, return to BASIC and continue running.

- *UPPER Display* allows a BASIC program to install hooks in the system that force all characters to

be converted to upper case before they are sent to the display or to the printer. Once you install the hooks, they work on all programs. Originally written for sight-impaired users, *UPPER Display* has applications in dimly lit environments or for reading the Model 100/102 at a distance.

- *FILE IO* describes in detail how to create standard file I/O routines in assembly, using system calls to do most of the work. The document(s) include complete code for opening, closing, reading, and writing a file in assembly language.

- *EZWAND*, an enhancement for the Model 100/102 bar code reader allowing use of both BCR and keyboard. The Tandy bar code reader comes with sample programs that allow input from the BCR but not allowing optional keyboard input—a necessity when bar codes are damaged or the operator must enter some data.

Prices for the *Technical Notes* start at \$40.00. For further information, contact King Computer Services, Inc., 1016 North New

Another New Product from Paul Globman!

X-VIEW.200 is here and ready to enhance the Tandy 200's built-in *TEXT* program with a unique cross-bank capability not previously available in the Tandy 200. This utility opens a "window" on your Tandy 200 LCD, so you can view another *TEXT* file from bank 2 while editing a file in bank 1. When you're finished viewing the second file, the "window" closes, and you are back where you left off, working in the original file.

Similar utilities have been available for PC's and larger systems, and now *X-VIEW* offers the same advantages for Tandy 200 users. You can keep a detailed help file or other often-needed files in bank 2 (phone numbers, ZIP codes, names and addresses, etc.), and when you need them you can bring them into view with just a few keystrokes. You can set a "place marker" in the secondary

file (viewed file) so each time you call that file into view, it displays from a predetermined place in that file. The viewed file scrolls in the opened "window" while a portion of the primary file remains intact on the LCD not part of the window.

You can move the "place marker" in the viewed file as needed without leaving the file you are working on. *X-VIEW* also offers the ability to disable word wrap (toggle word wrap on/off). This allows the Tandy 200 LCD to display more text and facilitate the creation of charts and tables that use lines longer than 40 characters.

X-VIEW requires that *XOS-C* be installed and can be purchased separately for \$9.95, or together with *XOS-C* for \$19.95. To get *X-VIEW*, plus *XOS-C*, mail a check or money order (\$9.95 or \$19.95) to Paul Globman, 9406 NW 48th Street, Sunrise FL 33351. *X-VIEW* will be shipped on a PDD-1 (Tandy 100K) diskette. They are also available on CompuServe's M100SIG. For further information, circle #62 on your Reader Service Card.

Hampshire, Los Angeles, CA 90029 (213)661-2063(voice), (213)666-6938(fax). Or circle #61 on your Reader Service Card.

Toshiba Ships NLQ Portable Printer

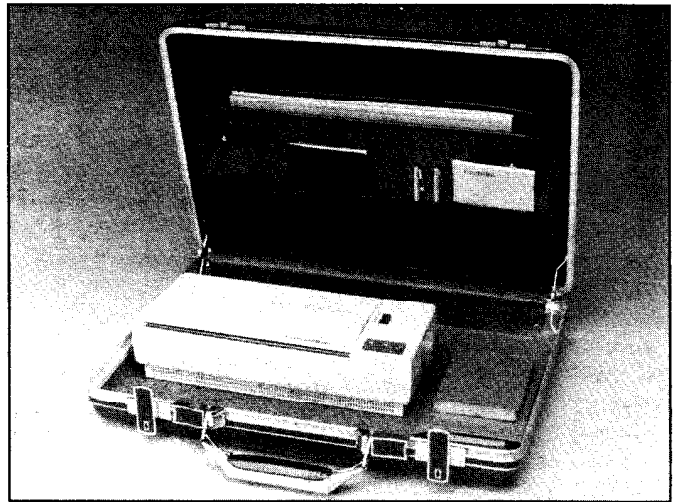
Toshiba America, Inc., is shipping the *Expresswriter 301*, a four-pound, 24-dot "letter-quality" printer. It uses plain paper and has five resident fonts (Courier, Prestige Elite, Draft, Condensed, Proportional). It prints at 60 cps in high-speed mode and 42 cps in normal mode.

The Expresswriter 301 has built-in rechargeable NiCd batteries and a separate 12-volt AC adapter, included with the unit. The charge for the batteries provides one hour of continuous printing. The printer's control panel includes a low battery indicator light.

The printer measures 12.2 x 5.5 x 3.0 inches, accepts paper sizes from 4 to 8.5 inches wide, and has built-in paper guides. It uses a black snap-in ribbon. Toshiba/Qume and Epson LQ Series emulations are standard, making the printer compatible with almost all software packages. The unit provides graphics resolution up to 360 x 360 dots per inch. The printer is supported by Toshiba's one-year parts and service warranty. An optional carrying case is available.

Suggested retail price is \$489.00. For further information, contact Toshiba America, Inc., Information Systems Division, 9740 Irvine Blvd., Irvine CA 92718 (800)457-7777. Or circle #63 on your Reader Service Card.

The Expresswriter 301 is a 24-dot "letter-quality" printer weighing only four pounds.



Rugged Bar Code Readers from Optical Data Systems

The *MSH-510* series of bar code scanners from Optical Data Systems has been especially designed for contact-scanning, rugged use, and battery operation. These scanners are ideally suited for use with portable computers equipped with a BCR port, as well as some H-P programmable calculators and low-power data collection systems. To conserve power, the scanner is equipped with an on-off trigger switch, which automatically turns the scanner's power off when not

in use. It is intended for operation in low power 5-volt digital systems. The pistol-shaped body is radically different from conventional wand-type scanners, and combined with its light weight (3.6 oz.) provides a better grip and easier handling in most scanning applications. Both straight and coiled cords are available and are normally terminated in a sub-miniature D-type 9-way female plug (other plugs or pin-outs provided on request).

An MSH-510 scanner often

reads codes that other, more expensive scanners fail: at angles greater than 45 degrees, over laminated surfaces, over poorly printed or colored bar codes, or through light oil or grease.

Prices for the MSH-510 LED Barcode Scanner start at \$109.00, and include a 12-month warranty. For further information, contact Optical Data Systems, Inc., P.O. Box 1987, Escondido, CA 92025 (619)745-6563. Or circle #64 on your Reader Service Card.

An Alternative to Traditional Battery Recharging

New Pathways Engineering offers the *Mark 30* family of charge controllers, which recharge NiCd battery packs in under four hours. The battery packs are protected from excessive charge current, voltage and current spikes, and overcharging. A trickle charge current keeps the installed battery in top condition. The unit consists of three active devices installed in a package only one inch long and one-quarter inch in diameter, which replaces the existing charge-limiting resistor (a high-wattage 22- to 33-ohm resistor, usually found in the power supply).

Most designers provide bat-

tery protection by approximating a NiCd battery's complex current demand curve with only one resistor. This means that the maximum current draw is limited to some value which will not damage the battery. However, the battery is starved for current while operating in its normal range.

New Pathways has taken a two-step approach to provide a better approximation of NiCd batteries' needs. The charge current is clamped to only 0.2 amps when the battery is more than 1.5 volts below the power supply voltage; then a 13 ohm load is provided as the battery voltage approaches the power supply.

For maximum performance, your power supply must be able to provide the full current demand of all your devices (not including the battery) as well as an additional 0.25 amp. If a more powerful power supply is needed, New Pathways's Model 155 Supply can provide up to three amps.

Many computers can benefit from this product, but New Pathways is currently offering a Special for the Tandy 1400LT. With the Tandy Special, Tandy 1400LT users can charge the battery while using the 1400LT and its hard drive (Tandy's power supply is unable to do this.). The Mark 31A charge controller and Model 155

power supply, when installed by Pathways's special procedure, increase battery usage times and eliminate false "low battery" warnings, "two-day" battery charge times, and power supply oscillation (repeated shut-downs).

Price of the Mark 30 Charge Controller is \$45.00; Model 155 Power Supply is \$60.00; and the Tandy Special (Mark 31A and Model 155) is \$90.00. For further information, contact New Pathways Engineering, 90 North Quinsigamond Avenue, Shrewsbury, MA 01545 (508)755-9669 or (508)755-3728. Or circle #67 on your Reader Service Card.

Get the Most from TEXT (Part 3A of 3 Parts)

The first two parts of this series were intended to show you how to deliberately exploit the best features of *TEXT*, your printer, and your own mind, without using any additional software. These manual techniques give you maximum RAM for your written work, but they are not especially convenient.

At the same time, learning to work this way forces you to look at the way you write and at what you write. The best word processing system in the world cannot make up for poor organization or for a lack of anything worthwhile to say. Regardless of the format (letter, report, etc.), business writing only succeeds if it helps other people understand you and agree with you. This happens to the extent that you:

- Have a clear outcome in mind: the result you want to obtain, the conclusion you want the reader to come to, the decision you want the reader to make, the action you want the reader to take.

- Know what the reader must see in order to support that outcome. What examples, facts, or illustrations can you give, and what's in it for the reader?

- Organize your presentation by writing it backwards. Begin by writing the conclusion, then the body, and finally the recommendations and the executive summary.

- Keep it simple and uncluttered. Put the heavy supporting charts and tables in the appendices.

- Pick a good, clean physical layout to contain your ideas. Use plenty of "white space" (i.e., generous margins and relatively short paragraphs).

- Figure out how to get the most out of your printer's features.

The very best solution to the mechanical problem of word processing on the Model 100 is to use one of the in-ROM text formatters. These devices require no

RAM memory to store or run their programs, and are generally faster than any other method of producing your output. To use a ROM-based formatter, you type your letter or report into *TEXT*, using "dot commands" or other embedded signals that will guide the ROM program. Once your document reads the way you want it to, you invoke the ROM program and sit back while the 100 and the printer do the work.

The chief obstacle to this ideal is that ROM's are expensive and becoming hard to find. You can still buy a new *Super ROM* direct from PCSCG, but other ROM

***The best word
processing system in
the world cannot
make up for
poor organization.***

manufacturers such as Traveling Software and Interactive Solutions have left the market, so you have to find owners willing to part with their treasures.

For most laptop owners, the answer is a program that resides in RAM. Since RAM-based programs take up space you need for your reports or letters, and since they are nearly always slower than ROM's, you want something small and efficient.

You'll also want to make use of *TEXT* utilities, such as James Yi's *TEXTE* program, that let you to turn off word wrap, use overstrike mode, and append text to

the paste buffer. James' program has contributed enormously to my productivity, and I recommend it highly to you.

A number of good text formatters have been written over the years, but the best is *SCRIPY*, a public domain program written by Tom Quindry and available on the *Portable BBS*. *SCRIPY* occupies very little RAM space, is written in machine language (so it's fast!), and, as they say, the price is right. If you have a CompuServe account, the libraries of the Model 100 Forum are loaded with similar goodies.

I have decided to contribute my two-cents' worth to this sea of software, in the form of this month's program, *LISTXT.BA* (Listing 1). I designed this simple text formatter to overcome common frustrations in using *TEXT*: the inability to see where you'll need to break words to minimize the raggedness of the right edge, and the inability to tell where the page breaks will fall.

I also wanted to be able to put headers and footers in my documents, along with page numbers. Nothing elaborate in the way of formatting—just getting words onto paper. I wanted to use minimum RAM and to be able to preview my documents before printing them.

LISTXT.BA will list a text file to the LCD screen or to a printer. If sent to LCD, the left margin is shown, word wrap is turned off to allow checking column alignment, and text is scrolled one screenfull at a time to facilitate proofreading. Page breaks are indicated by showing headers, footers, and page numbers. Printer control codes can be embedded as usual in your file, but they won't show up on the LCD. I find that a pad of paper is handy for making notes about page breaks, hyphenation, and line breaks in the middle of an underscored section.

If your file is sent to a printer, pages are

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Reviewed in March 1989 'Portable 100'

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Circle 128 on reader service card.

formatted the same way as shown on the LCD; this is as close to WYSIWYG (What You See Is What You Get) as I could come. The printer pauses between pages to let you change or straighten the paper.

Once you take out all the REMarks and extra spaces, LISTXT is a fairly small program. The features are limited, to minimize space requirements. This means that the screens you see are not exactly glitzy, but they get the job done. It also means you must take responsibility for changing the format by yourself. Want to change margins? Fine—use BASIC's EDIT mode to change the variables in line 310. I could have written a few lines of code to prompt you for the numbers and incorporate them into the

**The screens you see
are not exactly glitzy.**

variables, but I thought you would prefer to save the room for your .DO files. Besides, my experience is that most people eventually settle on a "standard" layout, so the space used for the prompting "bells and whistles" is wasted, and the features themselves quickly become a time-consuming nuisance.

LISTXT is designed to produce the sort of standard layout discussed in my two previous columns. Unless you change them, your documents will get 10 spaces for left and right margins, and 6 lines each for top and bottom margins. Paper is assumed to be 8.5 x 11 inches, with headers and footers placed in the top and bottom margins. The REMarks

should tell you most of what you need to know in order to change margins, line spacing, and so forth.

Two points to emphasize, however: You must have HEADER.DO and FOOTER.DO set up before running LISTXT (even if they each contain only a single space or carriage return). And you must align the top of your paper with the top of the print head before printing starts. As written, it works just fine with the older Tandy printers; I haven't had the opportunity to check it out with other brands, but I expect it will work with them as well. See the notes in lines 326-328 on this.

There are certainly a great many things that LISTXT won't do (yet): centering, right justification, taking care of widows and orphans, and so on. You will notice that the line numbers are not sequential. This is because I expect to come back to this program over the next few months to add features and generally spiff up the code. For now, it can take care of most of my word processing/text formatting needs—I hope you find it as useful!

Valeas, qui legis quod scripsi!

—Bill Brandon

Editor's note: Bill's FULL POWER column is written mainly for the beginning to intermediate user, so his program is heavily commented to help guide the beginning programmer. Unfortunately, that makes it too large to fit in this issue along with the column.

While I can normally remove REMark statements and otherwise compress a program to make it fit, I feel that doing so in this case would be a disservice to his readers. Instead, we'll print LISTXT.BA in its entirety next month. In the meantime, we'll put the program on the Portable BBS for those who wish to download it.

—MN

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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.

SPREADSHEET TRANSFER UPDATE

(In response to the April '89 letter from Joel Perlish) I frequently use my Model 100 to work outside typing raw data in text or a database. Later I transfer the result to an MS-DOS computer, a Macintosh, or my own Apple IIe. I don't have a spreadsheet program on the Model 100, but I've exchanged such files between my MS-DOS computers and my Apple IIe.

If your Tandy 200's spreadsheet program can produce a *DIF* (Data Interchange Format) file, all is done. Produce the *DIF* file and read it with the proper choice in the third Appleworks menu.

If it is not possible, ask your spreadsheet program to generate an ASCII text file. Read this text file with the Appleworks Database option in the third menu. Produce a report with almost the same presentation as the original spreadsheet and print it on disk as a *DIF* file. Read this *DIF* file with the Appleworks spreadsheet option, and that's it. You must note that only the ASCII content of the cells will be transferred, not the formulas.

I agree, it is not simple, but it works. For an occasional transfer it's sufficient, but as a regular process it is boring. That's all I can do for you. If you find another method, please let me know with a posted note or EasyPlex on CompuServe (70611,2033).

**Gilles Marier
Repentigny, Quebec, Canada**

Thanks for the help, Gilles! Multiplan in the Tandy 200 doesn't produce a DIF file but produces an ASCII SYLK (SYmbolic LinK) file, whose format is described in Appendix E of the Tandy 200 Multiplan Manual. Appendix D mentions that DIF files can be readily converted into the Multiplan SYLK format, but it doesn't say how. I would think

if you can convert them one way, you could convert them back. Have any readers done this? We'd like to hear from you.

-MN

EMBED.600 UPDATE

Even without a BASIC ROM chip you can embed escape codes in text on the Tandy 600 (see DEFUSR, January '89 and June '89). Just open a file (like *ENVIRON.SYS*) that already contains escape codes—they look like back arrows—and copy them to your document.

**Helmer Isackson
CompuServe M100SIG**

**Just yesterday we
found one at a used
bookstore.**

DISCONTINUED BOOK

Thank you for sending me the listing and instructions for the program *LPTLF*. It works like a charm and saves me the trouble of changing DIP switches when I use my Epson printer, which normally is connected to my Apple. While on travel I use the TTX printer, which does not need a line feed, so I now can work it either way with the help of the *LPTLF* program. If you have more such handy utilities, could you please let me know where I can find them?

I once received a tape with a number of programs: *Sizer*, *Xtime*, *DB* (database), *Sort*, *Enter*, *Xtrct*, and *Tcalc*. They seem to

originate from a booklet originally published as a Tandy product. I have been unable to find out whether this set of programs and instructions is still available. Some are self-explanatory, but *DB* requests a "format file," and I have no idea what that means. I would be happy if you could help me.

**Paul H.E. Meijer
1438 Geranium St., N.W.
Washington, DC 20012**

The tape goes with a book called Portable Computing with the Model 100 (Tandy catalog #26-3820, discontinued). You might still find one in a dusty bin in some Radio Shack store. Just yesterday we found one at a used bookstore. (How's that for timing?)

The docs for DB are too long to detail here, but I can get you started. Create FORM.DO

```
10
LAST NAME:
FIRST NAME:
STREET ADDRESS:
APT. #:
CITY:
STATE: ZIP:
SOCIAL SECURITY #:
BIRTHDAY (M/D/Y):
ANNUAL PLEDGE: $
LAST CONTRIBUTION (M/D/Y):
11
1,11,A25
2,12,A15
3,16,A25
4,9,A15
5,6,A35
6,7,A2
6,21,A5
7,21,A11
8,21,A8
9,15,N#####.##
10,30,A8
```

Figure 1. Example FORM.DO for use with DB.BA program from Portable Computing with the Model 100.

DEFUSR

(the format file) as shown in Figure 1.

FORM.DO sets the layout, or form, of a database record. The first line gives the number of lines in a record (10). Next come the ten actual lines of the form (the prompts) as they will appear on the screen. Then comes the total number of fields in the form (11 in this example). Following that is a list of field descriptors for each of the eleven fields. The first two numbers show the line and column at which the field starts on the screen. The third descriptor is the display format—A for alphanumeric data, followed by the length of the field, or N for numeric data, followed by a format specification for the number.

Follow the prompts and you'll at least be up and running. There's much more to know, so you'll still want to obtain the book. Since we can't part with ours nor legally send you a photocopy, I've printed your address in hopes that readers who own the package will contact you. Good luck!

-MN

HIMEM CONFLICT

I have the program T-View from Traveling Software, and it consists of T-LOAD.BA, T-VIEW.BA, and DRIVER.CO. I have been trying to install T-VIEW.BA along with my diskManager program so that I don't have to reload T-VIEW.BA every time I use the disk program. But it doesn't work that way. When I use diskManager, it clears my high memory, losing T-VIEW.BA.

I tried using a program (DO-CO) from the Tandy BBS, but it does not work. Both programs have different memory locations. What can I do?

J.J. Rechany
St. Petersburg, FL

CompuServe's Model 100 Forum has a relocatable version of DSKMGR (disk manager) that should solve your problem.

First install DRIVER.CO and determine where it resides. If this isn't specified in the T-View documentation, then type LOADM "DRIVER" and press ENTER to display its Top, End, and Exe addresses.

Then run the relocatable DSKMGR to create the machine language disk manager to reside below the Top address of DRIVER.CO. The programs should now coexist without problems.

One caveat: If T-VIEW.BA uses a CLEAR statement that sets HIMEM to DRIVER.CO's Top address, you may want to modify it to set HIMEM to DSKMGR's Top address instead. Then running T-VIEW.BA won't set HIMEM too high for DSKMGR.

-MN

SCRIPSIT WITH D/VI

Please assist me with what may be an odd problem. I use my Model 100 with

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a RadioShack Disk/Video Interface (D/VI). For software I use *Scriptit 100* and the *Buddy Systems* package advertised in an early issue of *Portable 100*. This is a powerful system for the D/VI with its *Append* and *Exerpt* programs. With them I can work with text files approaching 176K in length. Basically, everything works well in all the programs.

It occurred to me to try to use *Scriptit 100* to word-process a lengthy raw file stored on the disk. There was initially no apparent problem. For file name I entered 0:FILENAME (or 1:FILENAME). *Scriptit* called the file up a line at a time, processed and printed perfectly. It seemed to make *Scriptit* much more effective and handled the long text files easily. I was not limited by the 32K of my Model 100. Speed was most acceptable, particularly with my Radio Shack DWP-210 printer.

Then the day of reckoning came. The printing was going smoothly and then it stopped printing at an arbitrary "letter," ended the page perfectly and stopped completely. I pulled the file apart, re-entered it on another disk and tried again. The printing went smoothly to a different arbitrary point (not associated with my refiling), stopped printing again, completed the page and again ceased altogether.

This approach is so useful I hate to not have it work. Can you please help?

Incidentally, Bill Brandon's programs are very useful to me. *Portable 100* is going very well.

William J. Spry
Youngstown, NY

I wish I could help, but we haven't the hardware and software needed to duplicate your setup. Can anyone else help us?

-MN

T200-TO-MAC

Do you know of any products which would allow me to connect my Tandy 200 laptop directly to my Macintosh? There is a null modem sold by Tandy that connects the Tandy 200 to the IBM. But I cannot find a null modem to connect it to the Mac. I understand that one of the wires is connected differently for the Mac.

Do you know of any kind of microcassette recorder on the market which would store data from the Tandy 200? The smallest recorder I can find is a bulky regular-sized cassette recorder sold by Radio Shack.

Kenton W. Elderkin
Dedham, MA

If you can find an old Imagewriter I cable you can use that directly; no null modem is needed. If not, then your best bet is to get a Mac-to-modem cable, plug your null modem into that, and then plug the null modem into your Tandy 200.

Several of the microcassette recorders can be used with the Tandy 200. The best seem to be the Sony model line. If you can find one with an ALIX input as well as a microphone, that will work best.

There have been several articles in *Portable 100* about hooking microcassettes to Tandy portables (our article index, \$9.00, can help you locate these, and photocopies of the articles are just \$1.75 each).

On the whole, you would do much better to get the Tandy Portable Disk Drive. It's much more reliable, much easier to use, much faster, and won't lose (blow) files larger than 20K (as the cassette system usually does).

-TK

Compatibility: Tandy 100/102

PRINTING AND READING BAR CODES

Use 3-of-9 bar codes easily and inexpensively.

by Jim McBurnett

Radio Shack recently offered bar code wands for only \$40 (Catalog #26-1183). This price included the wand, the instruction manual, and a cassette tape containing the required machine language programs for reading Modified MSI Plessey, UPC-A, and 3-of-9 bar codes.

The 3-of-9 code, with alphanumeric capability, supports the space character, letters A-Z (uppercase only), the numerals 0-9, and five additional characters (.,\$,/,+,-,%). It requires a start/stop character, the asterisk (*), at each end of the code. Each character consists of 5 lines and 4 spaces. Three of these 9 line-space entities are wide, hence "3 of 9."

The Radio Shack manual contains complete instructions for loading the machine language program B3OF9.CO. The manual also has examples that you can run to verify the operation of the wand. A typical program for reading 3-of-9 bar codes is shown as READ39.BA. A word of caution: For some reason, B3OF9.CO reads the bar code for the period (.) as if it were an exclamation point (!).

Unfortunately, the package from Radio Shack does not include the software for generating the bar codes. You can find suitable programs in the public domain, but it's simple enough to write one. The program PRNT39.BA prints the 3-of-9 code to the Model 102 screen.

But having the bar code on the screen of the Model 102 is only half the battle. To complete the process, use a screen dump program such as the one written by David A. Cloutier ("What You See Is What You Print," *Portable 100*, December '84). If your printer ribbon is in good shape and the paper is high quality, the result gives highly readable bar codes.

Radio Shack's program B3OF9.CO allows up to twenty-three characters per line of bar code. However, the number of pixels on the Model 102 screen reduces this maximum to only thirteen. Lines 40-80 convert any lower-case letters to upper case. The data lines 1000-1150 are read to determine which three of the nine (line-space) entities are wide. For example, the character A has a wide entity at positions one, six, and nine. When the resulting bar code is printed to the screen of the Model 102, narrow entities are

one pixel wide and wide entities have a width of three. The height of each line or space is thirty-five pixels. Line 130 serves to separate each character by a single pixel-width space.



```

10 DIM W(9):CLS:FOR I=1 TO 9:W(I)=1:NEXT
  I
20 INPUT "TEXT (13 chars MAX)";M$
30 CLS:L=LEN(M$):IF L>13 THEN PRINT "TOO
  LONG":GOTO 20
40 REM If necessary, convert to upper c
  ase
50 FOR I=1 TO L
60 J=ASC(MID$(M$,I))
70 IF J>96 AND J<123 THEN MID$(M$,I,1)=C
  HR$(J-32)
80 NEXT I
90 T$=" "+M$+" ":M$="*"+M$+"*":L=L+2
100 FOR K=1 TO L:RESTORE
110 READ C$,X,Y,Z:IF C$<>MID$(M$,K,1) TH
  EN 110
120 W(X)=3:W(Y)=3:W(Z)=3
130 A=A+1:B=B+1
140 FOR I=0 TO 8 STEP 2:A=B+W(I):B=A+W(I
  +1)
150 FOR J=A TO B-1:LINE(J,25)-(J,60):NEX
  T J
160 NEXT I
170 W(X)=1:W(Y)=1:W(Z)=1
180 NEXT K
190 PRINT@119+L,T$
200 PRINT@1,"":END
1000 DATA A,1,6,9,B,3,6,9,C,1,3,6
1010 DATA D,5,6,9,E,1,5,6,F,3,5,6
1020 DATA G,6,7,9,H,1,6,7,I,3,6,7
1030 DATA J,5,6,7,K,1,8,9,L,3,8,9
1040 DATA M,1,3,8,N,5,8,9,O,1,5,8
1050 DATA P,3,5,8,Q,7,8,9,R,1,7,8
1060 DATA S,3,7,8,T,5,7,8,U,1,2,9
1070 DATA V,2,3,9,W,1,2,3,X,2,5,9
1080 DATA Y,1,2,5,Z,2,3,5
1090 DATA 1,1,4,9,2,3,4,9,3,1,3,4
1100 DATA 4,4,5,9,5,1,4,5,6,3,4,5
1110 DATA 7,4,7,9,8,1,4,7,9,3,4,7
1120 DATA 0,4,5,7
1130 DATA .,1,2,7,$,2,4,6,/,2,4,8
1140 DATA +,2,6,8,%,4,6,8,-,2,7,9
1150 DATA " ",2,3,7,*,2,5,7
  
```

Listing 2. PRNT39.BA. This program generates bar codes you type in and prints them on your M100 screen. Use a screen dump to your printer to get them on paper.

```

10 CLEAR 100,61788
20 CLS:PRINT "Press (ENTER) to Quit"
30 RUNM "B3OF9"
40 OPEN "WAND:" FOR INPUT AS 1
50 ON ERROR GOTO 100
60 INPUT#1,AS
70 IF AS$="" THEN 100
80 PRINT AS$
90 GOTO 60
100 CLOSE
110 CALL 61807
120 END
  
```

Listing 1. READ39.BA. Use this simple program to read 3-of-9 bar codes.

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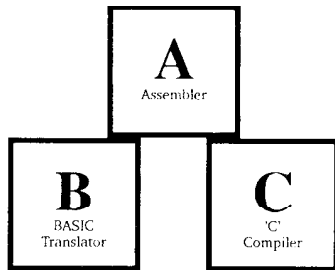
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1985

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

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

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

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

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

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

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

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

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

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

1986

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

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

Personalized Form Letters.

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

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

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

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

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

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

November: Picos in Libraries, *Clever M100 Combinations, Exploring TPDD Part I*, Reviews of Data-computer 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.

1987

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

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

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

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

June: Lawyers & Laptops, *Personal Management System, M100/Mainframe Terminal Prog.*, Re-

views of Wang Portable, *Search, Sprint and Super-calculator, Best of CompuServe book*, Chess-to-go.

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

August: NEC ~~8201 tokens~~ Laptops in Movie filming, Talking Port **OUT** Reviews of Casio FX-8000G, Tandy T400LT, and *System 100.*

September: *English Teachers use Laptops, Picos in Class, Document templates, Picos in the Oil Patch*, Reviews of HP ColorPro, and the *Sportster 1200 modem.*

November: *Control That Printer, Academia & Iaptops*, 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.

1988

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

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

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

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

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

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

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

November: European EMAIL, New Tricks for your 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.