

TERRY KEPNER'S

# portable 100

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A MONTHLY PUBLICATION (EXCEPT COMBINED JULY/AUGUST ISSUE)

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THAT IT! TARZAN TAKE NO MORE! KEEP GET  
BAD MESSAGE! WHAT MEAN?! TARZAN TRY  
EVERYTHING! MAKE TARZAN MAD LIKE CHEETAH!  
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*The 5th Wave* by Rich Tennant, excerpted from *Dos For Dummies*.



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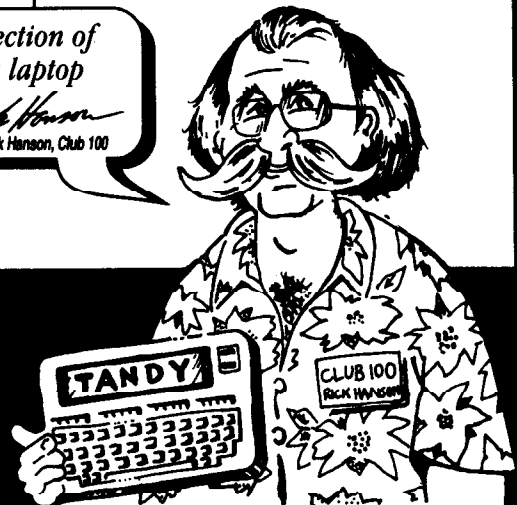
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## Program Collections

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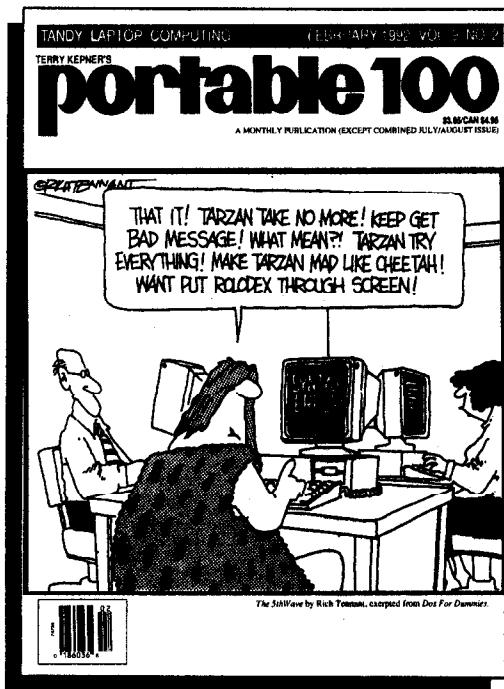
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**ON THE COVER:**

Rich Tennant is a talented cartoonist and obvious computer user. He has a new book coming out in March, which we hope to be lucky enough to review in an upcoming issue. Rich's cartoons take an already hilarious Dos For Dummies and turns it into a laugh riot.. We are very grateful to him for sharing his work with us both inside and on the cover of Portable 100. If you see his name on a cartoon book, grab it! You won't be sorry.



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## ROM WITH A VIEW

**A**s you may have noticed, the January issue said it included the catalog from Club 100. As you also may have noticed, the catalog was not there.

I won't bore you with the details, but a comedy of errors (or tragedy, depending on your point of view) prevented us from including the catalog. The postal authorities took much exception to the inclusion and we were forced to mail the catalog separately, via third class. And this was over Christmas, with most people gone to visit relatives. So, not only did we mail them separately, they both went out late; the catalog following the magazine by several days (the post office insisted we not mail them together, not even on the same day).

At first, we received lots of calls from people complaining that the catalog must have fallen out of their magazine. We worried that maybe the catalog mailing had been lost, until we got a call from a guy in Canada saying he had received a catalog, but no January magazine!

Anyway, if you haven't received the catalog, drop us a postcard and we'll send one from our small supply of leftovers.

We're putting out a call for writers for the magazine. We can't pay very much right now, only a trade for subscription extensions (i.e., we'll extend your subscription a year, or give a friend or relative of yours a free subscription). We're looking for both Model 100 articles and MS-DOS articles.

For the Model 100, practically any subject is open. We need applications stories (like, perhaps, how Martin-Marietta is using Model 102's to build the fuel tanks used on the NASA Space Shuttles), games (both simple and difficult), graphics (both on-screen and getting it to paper), programming pieces, and just about anything else that works on the Model T.

For MS-DOS, we're interested in application stories, games that run in BASIC or that we can make available on our BBS for readers to download, and reviews of hardware and software of particular interest to portable computer users.

We need a regular columnist for Deskmate reviews (George Sherman was doing a splendid job, but health and other reasons forced him to stop), and someone to help with our MOVING UP column (easing the path for those moving from the Model T family to MS-DOS). Again, we can't offer much except the attraction of your name in print and subscription extensions, although we can supply software for review (which you can keep after the review is finished).

This issue, we welcome Automap to our list of advertisers. *Automap*, as you may recall, lets you create trip maps for your travels. It's a lot like the maps Triple-A used to make, and lots cheaper. They also have neat software on astronomy and biology.

The portable MS-DOS market is going to heat up this fall, the first real color display machines, at affordable prices, are hitting the market in quantity. Affordable, you ask? Well, they aren't below the two thousand dollar mark, but they have dropped from the nine thousand dollar level to under four thousand.

With these on the horizon, Tandy won't be far behind in producing their own machine. And given their latest track record in inexpensive, top-of-the-line, computers, it ought to be a real humdinger.

Well, I'm out of room now, so see you next month.

tk

## Toolbox

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

Normally, the Tandy LP-1000 is capable of emulating only a Hewlett Packard Laser Printer Plus, but with the

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

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

## portable 100

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

# Dear Mike Daigle:

I enjoyed your November rant almost as much as I suspect you did. The only point I disagree with (and maybe I'm just ultra-radical) is that I don't feel the Model T needs improvement, so much as support. The machine itself is more than capable of any task short of two way communication with God's own database... (Although, perhaps by connecting the RS-232 through a wafer of unleavened bread ... hmmm ...)

What burns my EPROMs is that Tandy has done so little to support their own pretty fabulous machine. When I first got "Rover" (my 102—if you can have a "Farfel". I can have a "Rover") I didn't expect much more than a slightly more sophisticated version of the pocket computer (which was my best pal through high school), but what I got was a magnificently versatile device which thumbed its nose at conventional computers by operating out of a menu-style (largely) non-volatile RAM structure. But to check a Radio Shack catalog, one would think you practically can't get anything to use with it!

If not for this forum and *Portable 100*, I wouldn't know there was such a huge group of Model T supporters, or so much software/hardware available. Tandy acts as though they initially planned to support it, but someone said, "Er, let's try to just forget we made it, and hope that it dies off."

Your Model 300 column started me daydreaming what my ideal would look like, but to tell the truth, I just want the terrorists who locked the 102 designers in a closet to release their hostages and let support for the machine flow again.

What is left unsaid is, "Wake up, you sheep-like world! MS-DOS is past its usefulness!" So, while the zombies stumble after the pack, waiting for the 80986 processor with MS-DOS V. 16.9 factory loaded on its hard drive, Rover and I will still be clicking along nicely! Maybe, just maybe, there will someday be a Model T-esque computer that impresses me, but if it ain't broke, don't fix it. And even if it is broke, fix it — don't throw it out!

Charles Fusner  
CompuServe Mail

## MODEL 100 RFI?

Just a note to let you know the PICO

magazines arrived in due time and to give a big thank you for the phone call to advise me my check did in fact get there. Boy, was that a big relief to get out of the "worry time." Incidentally, the newsletter I inquired about was the *Portable Program Review*. Are any of those still be had?

It is my understanding that there is a better DOS for the PDD-11 that is in the public domain, and if so, do you have it on disk? I'd sure like to have it.

Got a question: Couldn't one pick off some signal someplace on a M100 and feed it thru an RF modulator (of which I have two) to act as an interface to a TV for a monitor? How about grabbing signal off the printer I/O? Or feeding signal into a Timex/Sinclair 12000 for the same purpose? Wouldn't that make a compact setup! I'd like to do something like that instead of getting a D/VI. Got any ideas?

Keep up the good work with *Portable 100* magazine. Go back to the early years and pick out some of the better hardware projects and practical program/utility listings and publish them again. I'm sure there are some present users who didn't get a chance at those opportunities and would appreciate it. One thing we can sure use more of is "Hints-N-Tips." These are always interesting and most informative. Keep up the good work. We need more of it.

I'm writing this under the awning of my motorhome. Life can sure be difficult at times. I'm doing my best to endure.

By the way I have five issues of *P100* that you are out of Jul. 84, Aug. 84, Apr. 88, May 88, Dec. 88. You are welcome to borrow them to make copies. Just ask.

Roger Koach  
Apple Valley, CA

*Sorry, but we did not have anything to do with that newsletter. Don't know who did. Can anyone else help?*

*The PDD-1 DOS you are looking for is POWR\_DOS and it's available on the Club 100 BBS and on the Model 100 SIG of CompuServe. Plus, in the PICO back issues (Nov. and Dec. 86) is a two part article on a small PDD1- DOS. The program and articles were written by J.K. Heilman.*

*As for hooking up to a monitor, this is what the Tandy D/VI was for. Other than that, there is no easy way to do it.*

*We are working on getting some of those old articles reprinted. One of them is in this month's issue. The problem primarily is*

*finding the time to properly research the articles and then type them into a computer for typesetting.*

*Thanks for your offer of those issues, but we do have one of each for our "morgue" files. We just don't have any extras for regular office use. If anyone would like to donate or sell us those copies from their collection, just drop me a line.*

-tk

## SUPER HERO SUPER FAN

Was about to let this lapse — but noticed the new *Super ROM* column (SUPER HERO). I keep trying new ideas, but this "personal" help is great! I've had mine since Feb. 87. Super Stuff!

M. Lloyd  
W. Columbia, SC

## ANOTHER FAN OF SUPER HERO

Like the idea behind SUPER HERO. No doubt *Super ROM* makes 100/102 into something really useful. And more ideas about using this great tool will be most welcome.

F. G. Willard  
Oakmont, Pa

## NOT SO CHEERY NEWS

At the time of writing, I have just finished reading the November 1991 issue of *Portable 100*. Although I have been wanting to write this letter for months, it was the letter from Ralph Winter in INPUT/OUTPUT that finally got me to meet fingers to keyboard!

Some, if not all, of the things I wish to say are not going to be pleasant to Model 100 users. I am sorry for having to be the carrier of bad news, but everyone keeps asking if it's their breath that offends and I just feel the need to get things straight.

Up until this summer, I was a Model 100 user. I originally purchased it for my wife, who is a fourth-grade teacher. I thought it would give her the ability to keep track of her students and word processing. When I originally presented the nifty little unit to her a year ago, I received less than rave reviews. Showing her how to use it was like teaching a stubborn child how to make her bed. It became evident that I was going to have to find a use for it to salvage the \$750.00 invested (this covers the cost of the used Model 100, additional memory, PDD, Super ROM and software).

Being an Insurance Broker, I felt I

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

passed our highest expectations for quality and clarity."

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

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

you like. Complete math between fields. Total interface with Lucid worksheets.

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

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

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

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

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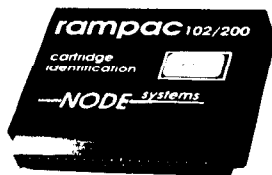
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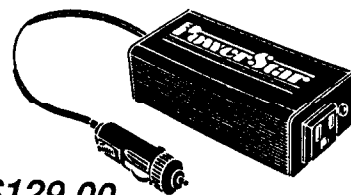


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could use the *Lucid* programing to keep track of clients and prospects. With much work and frustration, I found the task excessively tedious and beyond feasibility. The shortcomings of too little memory and primitive programming were holding me back. Of course, conflicts between programs and cold starts weren't helping me, either.

It finally sunk in that I had to dump this outfit fast and buy a larger capacity computer. Ads at the time made me realize that for a few hundred dollars more than I had in my Model 100 ensemble, I could have bought a dual-floppy 8088 laptop! Well, saying and doing are two different things. Trying to sell my Model 100 was like selling a three-fingered glove. No one wanted it, no matter how I demo-ed it, and believe me, I can sell! Finally I sold the whole outfit for less than half what I paid for it a year ago. Last I heard, the gentleman who bought my outfit has hardly used it!

My reason for retelling this sad story is to set the scenario for what I'm trying to say. When I bought the Model 100, I saw ease of use, portability, light weight and lengthy battery life. In actuality, I received:

1) Frequent cold starts due to incompatibility of programs and peculiarities of the system's architecture.

- 2) Portability only when the disk drive wasn't needed.
- 3) The need to practically carry a small suitcase for the unit, drive and peripherals; inability to use the lower wattage, but equal voltage rechargeable batteries to cut expense.

When none of the aforementioned problems were occurring, the programming was too limited and primitive to handle my modest needs.

Where it is true that the Model 100 family has the unique ability to expand, no one has stepped forward and admitted the real problem with doing so — \$\$\$. To prove my point, let's make a true-to-life comparison. Last fall, I bought a Bondwell B310P286 16 MHz laptop for \$1,500. This price included the laptop with a 40 MB harddrive, 3.5-inch high-density floppy-drive, 1 MB of RAM (expandable to 2 MB), back-light LCD 80-column screen, AC adapter/charger, two nickel-cadmium batteries and a multitude of very usable software. Today the same laptop, less the backlight screen, is selling for \$999.00!

Which is the simpler computer to operate, the Model 100 or the DOS-based 286 laptop? Which offers the greater flexibility and expandability? Interesting questions.

Let's make this more fair. Let's add to

the Model 100 a Booster Pak with all the ROM and RAM chips it could hold. Let's also add all the popular and available ROM chip and software programs. While we are at it, let's throw in a D/VI or 80-column monitor interface. Any idea what amount you raised the ante? Are we equal yet? The dollar figures are staggering for what will still be a computer running at a clock speed of around 2.5 MHz!

How could this situation be resolved? It can't. That's why the Model 100 will never be anything more with Tandy. It has no future. Ironically, I firmly believe that the future of the computer holds the extensive use of re-writable ROM chips and cards, instead of the mechanical harddrives of today. In that aspect, the Model 100 is a whisper of the future. But, the Model 100 would have to be totally redesigned to provide the large quantities of RAM and ROM, not to mention be IBM-DOS compatible. As you have mentioned, the compatibility differences between palmtops and laptops are diminishing quickly. The Model 100 is a tired old work-horse that can certainly kick arse with the best of them. But she no longer runs up front with the pack.

If you wish to continue to specialize in this venerable old lady, as your maga-

*Continued on page 18.*



**COMPATIBILITY:**

Model 100, 102, and 200 computers.

# Dynamic Duo for the Node Datapac

*Two simple programs: one for moving files, en masse,  
and another to emulate the main menu in your programs.*

by Jim Brad

**H**ere are two programs I wrote for the Model T (issued to each officer in the police department I work for). My department has only about thirty-three officers, making it a bit easier to outfit each of us with this little wonder. The benefits of this foresight have been many, including teaching typing skills and facilitating production of legible reports. One severe limitation to the Tandy 102, of course, is the memory capacity. The 32K is no match for six two-page reports, per officer, per day. I am assigned to Criminal Investigations, where the length of written reports averages much more than this. As a remedy, I snatched up one of the 128K Node Datapacs. This solid-state disk drive has been a lifesaver for me. The Datapac came with immensely helpful documentation, which sufficed, at first. Then, boredom set in ...

---

**I became dissatisfied  
with the amount of time it  
took to load files from the  
Datapac one by one.**

---

**ORIGINS**

I don't know if this type of program has been created for the Datapac, but the idea for it came from several motivations. First, and foremost, I became dissatisfied with the amount of time it took to load files from the Datapac one by one. Second, I wanted some process by which I could "tag" multiple files and perform any one of several operations on them (this should plant an idea or two for some of you).

Third was the machine's main menu itself. The simplicity and ease of use at the menu level has made the Tandy 102 one of my favorite computers. I wanted a file (or program front-end) manipulation tool that was equally simple and attractive.

```

10 CLEAR500:CALL16959:MAXFILES=2:ON ERR
OR GOTO 275
15 CLS:SS="" :ES=CHR$(27):RS=ES+"p":QS=E
S+"q":CALL 63013,8
20 GOSUB 280
25 PRINT@133,RS;"B";QS;"Asic Programs":
PRINT@173,RS;"C";QS;"O/ML Programs":PRIN
T@213,RS;"D";QS;"Ocuments"
30 K$=INKEY$:IF K$="" THEN 30
35 K=ASC(K$):IF K=13 OR K=27 THEN 270
40 IF K$="B" OR K$="b" THEN GOTO 60
45 IF K$="C" OR K$="c" THEN GOTO 65
50 IF K$="D" OR K$="d" THEN GOTO 70
55 GOTO 30
60 P=128:GOTO 75
65 P=160:GOTO 75
70 P=192:GOTO 75
75 POKE-1,P
80 CALL 63013,12:X=-1:PRINT@81,"Please
wait, Counting RAMDSK files:"
85 X=X+1:CALL 63013,10,VARPTR(SS):PRINT
@116,X
90 IF PEEK(-1)=0 THEN 95 ELSE85
95 CLS:DIMFS(X)
100 CALL 63013,12
105 POKE-1,P:L=-10
110 CALL 63013,10,VARPTR(SS)
115 L=L+10:I=L/10:FS(I)=LEFT$(SS,6)+" "+
RIGHT$(SS,2)
120 IF L>10 THEN 125 ELSE 130
125 IF FS(I)=FS(I-1) THEN FS(I)=">>DONE<
<"
130 PRINT@L,FS(I)
135 IF PEEK(-1)=0 THEN 145
140 GOTO 110
145 Z=L+10:L=0:PRINT@L,RS;FS(L);QS
150 K$=INKEY$:IF K$="" THEN 150
155 K=ASC(K$):IF K=13 THEN GOTO 210
160 ON K-26 GOSUB 270,170,180,190,200,17
    
```

Continued.

Listing 1. FILE+. If you have a Node Datapac on your Model 100/102, this program lets you "tag" files and move them quickly from the Node to the computer's memory.

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```

0
165 GOTO 150
170 PRINT@L,F$(L/10):L=L+10:IF L=Z THEN
L=0
175 GOTO 205
180 IF L/10<1 THEN L=Z-10:PRINT@0,F$(1):
L=Z-10:GOTO 205
185 PRINT@L,F$(L/10):L=L-10:GOTO 205
190 PRINT@L,F$(L/10):L=L-40:IF L+40<40 T
HEN L=L+40
195 GOTO 205
200 PRINT@L,F$(L/10):L=L+40:IF L>X*10 TH
EN L=L-40:GOTO 205
205 PRINT@L,R$,F$(L/10):Q$:RETURN
210 IF LEFT$(F$(L/10),2)=">>" THEN 235 E
LSE 215
215 OPEN "TEMP!!DO" FOR APPEND AS 1
220 F$=F$(L/10):PRINT#1,F$:CLOSE1
225 F$(L/10)=" "+RIGHT$(F$(L/10),8):PRIN
T@L,R$,F$(L/10):Q$
230 GOTO 150
235 S$="":CALL 63013,12
240 OPEN "TEMP!!DO" FOR INPUT AS 1
245 LINE INPUT#1,S$:IF EOF(1) THEN 260
250 CALL 63013,13,VARPTR(S$):CALL 63013,
23,VARPTR(S$)
255 GOTO 245
260 CALL 63013,13,VARPTR(S$):CALL 63013,
23,VARPTR(S$)
265 CLOSE 1:KILL "TEMP!!DO"
270 MENU
275 IF ERR=52 THEN MENU ELSE BEEP:MENU
    
```

```

280 CLS:T$=STRING$(40,"@"):Square made
with Shift-Grph-X
285 PRINT@0,T$:PRINT@280,T$:PRINT@3,R$;"
FILE+.BA for the Node Datapac (tm)":PRIN
T@290,"Written by Jim Brad":Q$:RETURN
290 END
    
```

### FILE+: HOW THE PROGRAM WORKS

Since I'm nontechnical, *FILE+* is written in what I like to call "CRUDE-BASIC." It works. It doesn't look pretty nor does it necessarily operate with high efficiency, but it works.

What happens is simple: The program says hello to the operator with a title bar and asks what kind of files you'd like to see. When you respond with the necessary key—*B* for *BASIC*

**Even we amateurs can  
enhance our *BASIC* programs.**

(.BA) programs, C for machine language (.CO) programs, or D for text (.DO) files—*FILE+* starts counting the number of that type of file in the Datapac and then dimensions F\$ to the same number.

Since the *CALL*s used to list files one by one have a nasty habit

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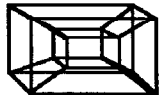
of re-sending the last file, I've told it to check for duplicate file names and, if one is found, call it *DONE*. This serves two purposes: First, it fixes the last file problem, and second, it makes an ideal execution prompt.

File names appear across the screen, and the program emulates the main menu I'm so fond of. When you find the file(s) you're after, simply place the widebar cursor over each and hit *ENTER*. *FILE+* takes the file name, loads it into a temporary file called *TEMP!!DO*, and makes the first character of the screen file a +. When you have all the files selected, take the widebar down to >>*DONE*<< and hit *ENTER*. If all goes well, the program then cycles back to the main menu and there you have all of the files you selected. *TEMP!!DO* is killed off just before the *MENU* command. You can leave the program at any time with the *ESCape* key (or the *ENTER* key at the initial menu).

### EMULATE.BA

As you can see, the algorithm I used to emulate the main menu in *BASIC* takes only five or six hundred bytes. I've provided *EMULATE.BA* (see Listing 2) to show how this can be done so that even we amateurs can enhance our *BASIC* programs.

I hope one of these programs spurs some easy-to-use applications for another out there who, like me, gets by on *CRUDE-BASIC*. I'm certain there's a much more efficient method for accomplishing the same end. Since I've learned *BASIC* from the little book that comes with the Tandy 102, my skills may not be up to snuff. If you have comments, please drop me a line at 70721,3020 on CompuServe.



```
0 'EMULATE.BA By Jim Brad
1 '
5 'E$=Esc code           F$=File/Prompt
  K$=Key pressed         L =Location/File
6 'R$=Rev Video on      Q$=Rev Video off
  T$=Title bar          Z =Last position
7 '
10 CLS:CALL16959:DIMF$(9):'Lock the scr
  oll and dimension F$
15 E$=CHR$(27):R$=E$+"p":Q$=E$+"q":'Esc
  codes for reverse video
20 GOSUB 155:CLS:'Get title bars
25 L=10
30 FOR I=0 TO 8
35 READ F$(I)
40 L=L+10
45 PRINT@L,F$(I)
50 NEXT I
55 PRINT@280,"Hit ESCape to exit"
60 Z=I:L=0:PRINT@L,R$,F$(L);Q$
65 K$=INKEY$:IF K$="" THEN 65
70 K=ASC(K$):IF K=13 THEN GOTO 130
75 ON K-26 GOSUB 145,85,95,105,115,85
80 GOTO 65:'Wait for key
85 PRINT@L,F$(L/10):L=L+10:IF L=Z*10 TH
  EN L=0
90 GOTO 125
95 IF L/10<1 THEN L=Z*10:PRINT@0,F$(0):
```

```
L=L-10:GOTO 125
100 PRINT@L,F$(L/10):L=L-10:GOTO 125
105 PRINT@L,F$(L/10):L=L-40:IF L+40<40 T
  HEN L=L+40
110 GOTO 125
115 PRINT@L,F$(L/10):L=L+40:IF L>Z*10-1
  THEN L=L-40
120 GOTO 125
125 PRINT@L,R$,F$(L/10);Q$:RETURN
130 'Jump here when ENTER is pressed
135 F$=F$(L/10):PRINT@210,F$
140 GOTO 65
145 'Menu jump
150 MENU
155 'Title bars
160 CLS:T$=STRING$(40,"_"): 'Square creat
  ed with Shift-Grph-X
165 PRINT@0,T$:PRINT@280,T$:PRINT@10,R$;
  "MAIN Menu Emulator":PRINT@290,"Written
  by Jim Brad";Q$:FOR N=1 TO 700:NEXT:RETU
  RN
175 'Data statements contain whatever yo
  u want F$ to be
180 DATAGOSUB1,GOSUB2,GOSUB3,GOSUB4,GOSU
  B5
185 DATAGOSUB6,GOSUB7,GOSUB8,GOSUB9
200 'END
```

Listing 2. EMULATE.BA. This program shows how you can create your own main menu, or modify the existing menu for the Model 100/102.

# TEACHING NUMBER RELATIONSHIPS

**H**ere is a simple program I wrote for my children. It asks the child to determine if the first number generated by the program is larger than the second. A capital Y signifies a yes and a capital N means no. If the child is successful, some stick men appear across the top of the screen with the computer playing a descending musical scale. If the child makes a mistake, the computer beeps and the child gets to try again. The program generates the numbers based on the random number generating sequences starting in lines 320 and 420.

Charles B. Tichenor  
Springfield, VA

**Yes, the clocks in  
Newfoundland are  
indeed one hour  
and thirty minutes  
ahead of those in  
New Hampshire.**

## AREA.BA IMPROVEMENTS

The lines given in listing two, if inserted in the AREA.BA program published in the September 1991 *Portable 100* (Vol. 8, No. 6, page 15), will add a Canadian capacity to it.

Perhaps a reader from the Northwest Territories can give us some assistance with all the narrow time zones that these polar territories dictate, and yes, the clocks in Newfoundland are indeed one hour and thirty minutes ahead of those in New Hampshire.

Michael P. Hermansen  
Breton, AB Canada

```

10 REM NUMBERS
25 Y=415
30 CLS
40 PRINT:PRINT
50 PRINT"          N U M B E R S"
62 FOR X=160 TO 199 STEP 3
64 PRINT @X, CHR$(147)
67 SOUND Y,10
68 Y=Y+60
69 IF Y=12535 THEN Y=415
70 NEXT
75 PRINT"Is the first number bigger than the          second number?"
80 PRINT
320 A=RND(1)
330 B=INT(100*A)
340 IF B>47 AND B<58 THEN PRINT @ 372,CHR$(B) ELSE GOTO 320
410 S=B
420 A=RND(1)
430 B=INT(100*A)
432 T=B
435 IF T=S THEN GOTO 320
440 IF B>47 AND B<58 THEN PRINT @ 386,CHR$(B) ELSE GOTO 420
450 T=B
500 INPUT M$
510 IF CHR$(S)>CHR$(T) AND M$=CHR$(89) THEN GOTO 600
520 IF CHR$(S)>CHR$(T) AND M$<>CHR$(89) THEN BEEP:GOTO 500
525 IF CHR$(S)<CHR$(T) AND M$=CHR$(78) THEN GOTO 600
530 IF CHR$(S)<CHR$(T) AND M$<>CHR$(78) THEN BEEP:GOTO 500
600 SOUND 2800,10:SOUND 2800,5:SOUND 2800,5:SOUND 2800,20
610 GOTO 30
700 IF CHR$(S)<CHR$(T) THEN BEEP:GOTO 500

```

Listing 1. Charles Tichenor's program for teaching children numbers and the keyboard.

```

45 DATA "AB Alberta 403",2
65 DATA "BC British Columbia 604".3
205 DATA "NF Labrador 709",-1
225 DATA "MB Manitoba 204",1
312 DATA "NF Newfoundland 709",-1.5
315 DATA "NB New Brunswick 506",-1
372 DATA "NT Northwest Territories, 403 Yellowknife; 809
Iqaluit ",0,1,2
375 DATA "NS Nova Scotia 902",-1
395 DATA "ON Ontario, Toronto 416, Ottawa 613; London 519,
Barrie 705, Thunder Bay 807",0
412 DATA "PE Prince Edward Island 902",-1
415 DATA "PQ Quebec, Montreal 514, Hull 819; Quebec City
410",0
425 DATA "SK Saskatchewan 306",1
535 DATA "YI Yukon 403",3

```

Perhaps a reader from the Northwest Territories can give us some assistance with all the narrow time zones that these polar territories dictate, and yes, the clocks in Newfoundland are indeed one hour and thirty minutes ahead of those in New Hampshire.

Listing 2. These modifications add Canadian capacity to AREA.BA (September 1991, pg 15).

COMPATIBILITY:

Model 100/102, NEC PC-8201A, Olivetti M-10 computers.

# CARCOUNT

Count cars, count rock stars, count bad guys,  
count Draculas, count anything.

By D. R. Rowland

**C**OUNT2.BA (see Listing 1) was written to count traffic moving past a point. There is specialized equipment for that purpose, of course, but it is expensive, cumbersome, under bureaucratic control, a temptation to thieves and vandals, and oftentimes more trouble than it is worth for a quick and dirty count.

But add some pressure hoses, a simple relay device, power supply, and a nice strong box to chain to the nearest telephone pole, and you could have a car counter that rivals the best available, just by hooking up one's trusty Tandy M100/102 or NEC PC-8201A and running a close cousin of COUNT2 as shown in the listings. The program would need about 8.5K of storage for all the data that was generated in 24 hours.

### YEAH, BUT WHAT CAN WE DO WITH IT?

Since this article is not being printed in *Highway Technicians Monthly*, we'd best talk a little about what the rest of us might use it for. CARCOUNT can be used in any activity that needs to record occurrences of two events relative to time. Time/motion and animal behavior studies come to mind. Or it could monitor such scientific endeavors as recording all the "um's" (one key) and "like you know's" (other key) in a rock star's news conference, or all the good guys and civilians (one key) and bad guys (other key) done away with in a Rambo movie.

Once you have your record, SUMMRY.BA (see Listing 2) reruns the data collected by COUNT2.BA as a graph so you can see what data you collected, and confirm, for example, that the villains do in a lot of people early in the movies but meet bad ends in wholesale lots near the end. If that's what you want to use it for, the running record on the top line of COUNT2.BA (see Figure 1) could be changed easily enough, if you like, to

- Dead #143 @ 18:42 900 Kph 4.0 Sec/Kill -

by playing around with the PRINT statements in lines 80 and 100.

COUNT2.BA is simple to use. You can start entering events immediately after starting the program, even before the screen is fully set up. Use one key (/ or \ on the NECCY, Z or z on the M100) to record one type of event (dead bad guys) and the other (/ or ) = NEC, / or ? = M100/102) to record the rest of the mayhem.

Every 20 seconds, the program plots the events of that latest period on the scale, with one event type shown above the base

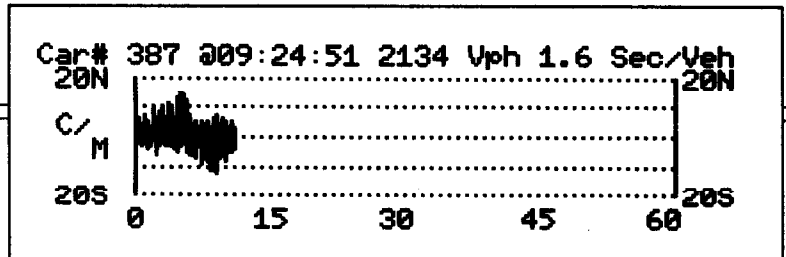


Figure 1. A sample of the COUNT2.BA screen.

```

0 REM COUNT2.BA copyright (c) 1991
1 REM by D.R. Rowland [72277,1433]
10 SCREEN ,0:OPEN "CARS" FOR APPEND AS 1
:PRINT #1,DATE$:PRINT#1,LEFT$(TIME$,5):D
EFINT J-Y:POWER CONT
20 CLS:J=0:PRINT:PRINT "^20N";SPACE$(32)
;"20N^^":PRINT "^C/":PRINT "^^^M":PRINT:
PRINT "^20S";SPACE$(32);"20S^^^^^^0^^^^^
^15^^^^^30^^^^^^45^^^^^60";:N=32
30 IF N<212 THEN N=N+3:PSET (213,4+(N/4.
5)):PSET (32,4+(N/4.5)):FOR M=11 TO 51 S
TEP 10:PSET (N,M):NEXT
40 B$=TIME$:B=3600*VAL (LEFT$(B$,2))+VAL
(RIGHT$(B$,2))+60*VAL (MID$(B$,4,2)):IF
B<D THEN D=D-86400
50 IF (J=180)*(S>50) THEN 20
60 IF ((B-D)/20=INT((B-D)/20))*(S>60) TH
EN J=J+1:FOR Y=31-X TO 31+W:PSET (J+32,Y
):NEXT Y:P=P+X:Q=Q+W:X=0:W=0:S=0:IF J/3=
INT (J/3) THEN PRINT #1, USING "##";P:Q:
P=0:Q=0
70 A$=INKEY$:S=S+1:IF (A$="Z")+(A$="z")
THEN X=X+1 ELSE IF (A$="/" )+(A$="?") THEN
W=W+1 ELSE IF A$=CHR$(27) THEN CLOSE:PO
WER 100:MENU ELSE 30:REM Use this line f
or 100/102
71 A$=INKEY$:S=S+1:IF (A$="{")+(A$="[" )
THEN X=X+1 ELSE IF (A$="}")+(A$="]") THEN
W=W+1 ELSE IF A$=CHR$(27) THEN CLOSE:PO
WER 100:MENU ELSE 30:REM Use this line f
or NEC
80 PRINT @0,"Car#";K+1;"@";B$;:REM Use i
n M100/102
81 LOCATE 0,0:PRINT "Car#";K+1;"@";B$;:
REM Use in NECCY
90 K=K+1:IF K=1 THEN D=B:S=0:GOTO 30
100 E=(K-1)/(B-D):PRINT INT (3600*E) "Vph
";INT (10/E)/10;"Sec/Veh^^";:GOTO 30
    
```

Listing 1. COUNT2.BA. A program to count things—cars, animal behaviors, movie mayhem, whatever. For compatibility, carets (^) are used here instead of spaces, so when you see a caret, type a space.

```

0 REM SUMMRY.BA copyright (c) 1991
1 REM by D.R. Rowland [72277,1433]
2 REM
10 CLS:SCREEN ,0:OPEN "CARS" FOR INPUT A
S 1:DEFINT J-Y
20 INPUT #1,B$,C$
30 PRINT B$,"Start at^";C$:PRINT "^40N";
SPACE$(32);"40N^^":PRINT "^C/":PRINT "^^
^M":PRINT:PRINT "40S";SPACE$(32);"40S^^
^^^^0^^^^^^15^^^^^30^^^^^^45^^^^^60";
40 FOR N=32 TO 212 STEP 3:PSET (213,4+(N
/4.5)):PSET (32,4+(N/4.5)):FOR M=11 TO 51
STEP 10:PSET (N,M):NEXT:NEXT
50 IF EOF(1) THEN 90
60 INPUT #1,A$:P=VAL (LEFT$(A$,2)):Q=VAL
(RIGHT$(A$,2))
70 FOR S=0 TO 2:FOR Y=31-INT(.5*P) TO 31
+INT(.5*Q):PSET (J+33,Y):NEXT:J=J+1:NEXT
80 IF J<180 THEN 50
90 A$=INKEY$:IF A$="" THEN 90
100 IF EOF(1) THEN CLEAR:MENU
110 CLS:J=0:GOTO 30
    
```

Listing 2. SUMMRY.BA. The companion to COUNT2.BA, this program graphs the data created by COUNT2 to show how the occurrences happen over time. As with Listing 1, when you see a caret (^), type a space.

line, and one shown below. The running record across the top is updated with each keypress. After each minute, the program sums up each type of event for the period and saves it in a file called CARS.DO.

## RAMBO-ING AROUND THE CLOCK

Since Rambo is not a one reel film (unfortunately), and traffic just keeps moving, you may need to collect more than one hour of data. All taken care of. The screen holds an hour's worth of data, and after a short pause to contemplate the running record, the screen clears and starts in again.

When the screen clears at the end of each hour, this does not mean your data is lost, however. COUNT2.BA has been busy squirreling the data away in the file called CARS.DO.

You say that Rambo is on a second bill that runs past midnight? No problem, more built-in brilliance to maintain the record. When you are finished counting cars or bodies, just press ESC, and it returns you to the main menu.

SUMMRY.BA is also easy to use. Just press any key to move forward in time from screen to screen.

## TYPING THEM IN

I wrote the programs so they would run on both the NEC PC-8201A and the Tandy 100/102, so LINE wasn't used, since NECCYs don't do LINES. It should also run on the Olivetti M-10, but hasn't been tested. There is a single PRINT @ in COUNT2.BA, with the corresponding LOCATE on the following line for the NECCYs among us.

I created the screen in part by the judicious use of spaces. To help you get them right when typing in the program, they are replaced by carets (^), to eliminate confusion. So when you see

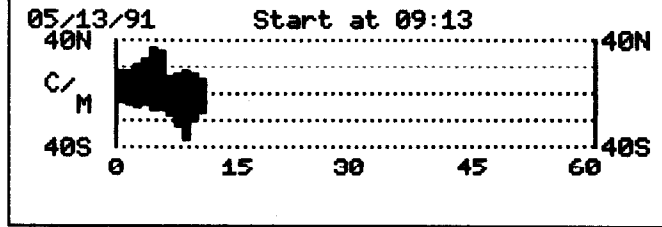


Figure 2. A sample of the SUMMARY.BA screen.

a caret in the program, type a space.

The keys used to record events on the 100/102 differ from the NECCY because of a different keyboard layout. You can change these keys in COUNT2.BA to ones you like and feel comfortable in using, by modifying line 70 or 71.

## COUNT2—LINE BY LINE

Line 10—The SCREEN command gets rid of the labels and frees up the bottom line of the screen for use in the program. The rest of the line OPENS a text file to store the data that it will generate and places into this file the current DATE\$ and TIME\$ to the nearest minute.

Line 20—This creates the titles in the screen image, and sets two variables; J is incremented by one every 20 seconds, and on reaching 180 (60 minutes times 3 increments per minute) after one hour, causes line 50 to jump back to this line, clear the screen, and start the graph over on the next hour. I used the other variable, N, in line 30 to keep track of which line is being plotted in the opening graph on the screen.

Line 30—The beginning of the main loop in the program. As long as N is less than 212, the opening graph has not been completed, and this line plots a bit more of it. I did this so that you can start counting vehicles or bodies right from starting the

program, rather than waiting until the screen is complete. Once N reaches 212, this line is ignored.

Line 40—This determines the present time, to be held as a variable B. At midnight, B changes from 86,400 (24 hours times 60 minutes times 60 seconds) to zero at the first tick past the hour. D is the starting time, set in line 90. Subtracting 86,400 from D (the time you started this program, set in line 90) each time you pass midnight allows the program to run through the midnight hour, and for as long as you want.

Line 50—This sets J to zero in line 20, and line 60 increments it. Line 50 tests if J is equal to 180, which, if it is, means that the screen is full. So if it is, then the program cycles back to line 20, clears the screen, sets J back to zero, and starts to make up a new screen.

The variable S is a number whose sole purpose is to keep the screen from immediately clearing and starting to redraw before you have a chance to look at the new value that was just plotted. It is reset to 0 every 20 seconds in line 70 (for NEC's; use line 71 for M100's) when that line plots the results of the previous 20 seconds of car counting, and it is incremented that same line 70 (line 71) each time the program loops past.

Since Rambo is not a one reel film, and traffic just keeps moving, you may need to collect more than one hour of data.

## PRINT #1, USING QUIRK

**A**n interesting little anomaly about M100 BASIC showed up while I was developing these programs. In line 60 of *COUNT2*, the data, as integers, are saved with *PRINT #1, USING "##";P,Q*, since *P* or *Q* will be one- or two-digit numbers (unless a high speed funeral happens to pass, or Rambo sets off a bomb). But in line 60 of *SUMMARY*, the same data can only be consistently called back as a string, with *INPUT #1, A\$*, and then manipulated. Using *INPUT #1,P,Q* gives an error if one of the numbers saved in *COUNT2* is more than one digit. If three or more #'s are used in line 60 of *COUNT2*, then the data can be recalled in *SUMMARY* with either *INPUT #1, A\$* or with *INPUT#1, P,Q*.

I stayed with the version I used, since it reduces the data stored by 25 percent. Over 24 hours, that's about 3,000 bytes.

Line 60—Tests if 20 seconds of car counting has gone by. The variable *S* is used here to keep the program from mistaking zero seconds for 20 seconds. If 20 seconds have gone by, then *J* is incremented by one, the number of cars in that 20 seconds (variables *X* and *W*) are plotted by the *PSET* statements, the values added to the number of cars in that minute (variables *P* and *Q*), and *X* and *W* set to zero to start counting again. If this 20 second increment completes a minute, then  $J/3$  equals  $INT(J/3)$ , and the number of cars in that minute (*P* and *Q*) are appended to the *CARS.DO* file, and it resets *P* and *Q* to zero.

Line 70 and 71—two versions of the same line, one (line 70) for use with the Model 100/102, and the other (line 71) for use with the NEC PC-8201A. The appropriate line, depending on your computer, uses *INKEY\$* to test if a key has been pressed, and determines if one of the two keys that are used to count cars has been pressed, or if the *ESCAPE* key has been pressed. If *ESCAPE* is pressed, the program is over, and you return to the main menu.

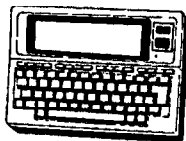
If one of your hot keys has been pressed, then the *X* or *W* variable is incremented, and the program proceeds to line 80. If nothing has been pressed, or a cold key used, then the program jumps back to line 30 after incrementing the *S* counter used by lines 50 and 60.

Line 80 and 81—If line 70 or 71 passes the program down to here, then a car has come past, and the top line of the screen is updated. Line 80 is for M100/102 users; line 81 is for the *NECCY*.

Line 90—The variable *K* is for "Kar" number, and it is incremented here each time a car passes. On the first car, when *K* becomes one, *D* becomes the current time, *S* is set to zero, and control of the program jumps to line 30 to avoid a division by zero error in line 100.

Line 100—Calculates and prints to the screen the number of cars per hour and seconds per vehicle, and then jumps back to line 30.

*D.R. Rowland is a civil engineer who, when he is not being polite, can be found lurking on CompuServe [72277,1433], probably plotting messages vs. time on a graph.*



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## Instant Utilities with QASM

*Don't bother with fancy assemblers;  
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*by John Comeau*

Once in a while, I stumble across something so incredibly SIMPLE that I kick myself that I never thought of it before.

About four o'clock in the morning one fine day in October, I was messing around in *DEBUG* on my MS-DOS clunker, and typed in what you'll see in the listings as *TURBO.ASM*. All it does is put my crummy XT compatible into "high" speed. But it does the job in only seven bytes, and from the DOS command line!

I had never thought writing executables could be so ridiculously easy. Then I thought, well, why not make a batch file

**I had never  
thought writing  
executables  
could be so  
ridiculously easy.**

to do the assembly, so if I start writing something a little more complex I can keep the commented source code? This took me a few more hours to get it right, using all sorts of redirected input and output, but then I had one more tool for my box—*QASM*, a quick assembler. Now I could make all sorts of little tools using that one.

**TAKE A PEEK**

*PEEK.ASM* is an example. It returns the contents of an address anywhere in

```
@echo off
if %1F == F goto nofile
set debug=FALSE
if %2T -- debugT set debug=TRUE
if %2T == DEBUGT set debug=TRUE
if %debug% == TRUE echo on
if not exist %1.asm goto quit
copy prefix.asm+%1.asm+suffix.asm %1.tmp >nul:
if not errorlevel 0 goto copyerr
if %debug% == TRUE pause
debug %1.com <%1.tmp |find "^C">%1.tm2
if %debug% == TRUE pause
debug %1.tm2 <subtract.dbg >nul:
debug <%1.tm2 |find/v "-">%1.tm3
if %debug% == TRUE pause
del %1.tmp
debug %1.tm3 <rcx.dbg >nul:
copy prefix.asm+%1.asm+%1.tm3 %1.tmp >nul:
if not errorlevel 0 goto copyerr
if %debug% == TRUE pause
debug %1.com <%1.tmp >nul:
goto exit
:quit
echo %1.ASM not found
goto exit
:nofile
echo no .ASM file was specified. (Don't use the .ASM
extension!)
goto exit
:copyerr
echo Error creating %1.TMP file. Check disk contents!
:exit
if %debug% == FALSE del %1.tmp
```

*Listing 1. QASM.BAT. A quick assembly language assembler using DEBUG to create short utility programs for MS-DOS.*

```
a
```

*Listing 2. PREFIX.ASM. A file needed for QASM to run.*

```
^Cq
```

*Listing 3. SUFFIX.ASM. A second file needed for QASM to work. Note: The ^C is a real CONTROL-C. Enter it from EDLIN using CONTROL-V, then C. It won't look like it worked, but after you finish insert mode and list it, you'll see that it did.*

```
m105 109 101
e100
68 31 30 30 0d 0a 71 0d 0a
w
q
```

*Listing 4. SUBTRACT.DBG. A third file needed for QASM.*



```
e100
3 72 63 78 0d 0a 77 0d 0a 71 0d 0a
rcx
12
w
q
```

Listing 5. RCX.DBG. The fourth file needed for QASM.

memory. This can be useful to programmers who want their software to be "smart" enough to install itself on the customer's computer. By looking at certain locations in the BIOS, you can find out lots of information about what's in the box.

One item is the level of compatibility. See the listing for *WHATARYU.COM*, which uses *PEEK* to find out what kind of IBM compatible your computer is. Another useful tool would be a means of returning a menu choice to a batch program. *MCHOICE* allows up to 255 selections. I hope sufficient for most menus. The DOS interrupt turned out to be better than I thought, beeping a warning if the user tried to type in too many digits. See *BIMBO.BAT* for an example of *MCHOICE* in action.

**Now I can make all sorts of little tools using that.**

Note that these last two programs, *PEEK* and *MCHOICE*, are at about the limit of complexity you'll want to deal with using *QASM*. Debugging and editing is a time-consuming and frustrating effort when one must change the jump addresses by an unknown amount each time one adds or changes instructions.

When you're ready for bigger and better projects, but don't have the computer capacity or budget for Microsoft's or Borland's offerings, I recommend *A Small C Compiler* by James E. Hendrix, published by M & T Books. Besides including all the source code and executables for a subset C language compiler, the disk that comes with the book has an assembler that is far more useful than *QASM*. All this for about \$25!

Enough said. Even with other language compilers and assemblers

```
jmp f000:fff0 ;jump to PC or XT BIOS boot routine
;change to what's appropriate for your CPU
```

Listing 6. BOOT.ASM. A miniscule assembly language program, which you can assemble with *QASM.BAT* (see Listing 1). It reboots your MS-DOS computer without your having to turn it off.

```
mov al,80 ;bit 7 gates 10MHz clock to CPU in LASER XT
mov dx,01f0;this port is on the support logic PLD
out dx,al ;send it
ret ;and back to DOS through INT 20 in PSP
```

Listing 7. TURBO.ASM. A short program, a software switch, that switches your XT compatible computer from regular to turbo speed.

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# ASSEMBLY LANGUAGE

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around, there are some tasks that just don't need a heckuva lot of processing to accomplish, but which Microsoft didn't get around to including in DOS. For little jobs such as these, QASM and your assembly language skills will conquer handily.

```

mov di,80 ;point to PSP command line buffer
xor ax,ax ;clear registers
mov bx,ax
mov cx,ax
mov cl,[di];get count byte
inc di ;point to next character of input
mov bl,[di];and load it in
cmp bl,09 ;tab?
jb 13c ;error if below
jz 15a ;otherwise loop
cmp bl,20 ;space?
jb 13c
jz 15a
cmp bl,30 ;"0"?
jb 13c
cmp bl,3a ;number or ":"?
jb 145
jz 165
cmp bl,41 ;A-F?
jb 13c
cmp bl,47
jb 145
cmp bl,61 ;a-f?
jb 13c
cmp bl,67
jb 145
error:
mov ax,900 ;DOS function to spit out string
mov dx,16d ;point to error (help) message
int 21
ret

```

Continued.

```

convert:
add bl,b0
jnc 14d
add bl,9 ;convert letter to HEX nybble
shl ax,1 ;move over for new nybble
shl ax,1
shl ax,1
shl ax,1
and bl,0f ;mask off high nybble
add ax,bx
loop 10b ;process all input
push ax ;now get peeked byte
pop di
es:
mov al,[di]
mov ah,4c
int 21
seg:
push ax
pop es ;left of colon now in segment register
xor ax,ax ;clear register for displacement word
loop 10b
jmp 15c ;peek seg:0 if no more input
errmsg:
db 0d,0a,"Usage: PEEK SSSS:DDDD$"

```

End of listing.

Listing 8. PEEK.ASM. With this program, you can peek into any address in your computer's memory and explore its contents.

```

mov di,80 ;point to PSP command line buffer
xor ax,ax ;clear registers
mov bx,ax
mov cx,ax
mov cl,[di] ;get character count
cmp cl,1 ;anything at all?
jbe 11d ;if not, skip directly to input routine
add di,cx ;now point to end of prompt string
inc di
mov byte ptr [di],24 ;put a "$" there
mov ah,9 ;DOS string output function
mov dx,82 ;point to beginning of prompt string
int 21
mov dx,200 ;point to input buffer
mov di,dx ;get response ...
mov byte ptr [di],4 ;room for 3-digit input
mov ah,0a ;DOS buffered input function
int 21
inc di ;point to return count
mov cl,[di] ;and load ...
or cl,cl ;if nothing, quit
jnz 131
ret ;error exit, nothing placed in ERRORLEVEL
xor ax,ax ;let's use AX to return the value
mov dh,0a ;since it's decimal, multiplier is 10
inc di
mov bl,[di] ;get next input byte
cmp bl,30 ;make sure it's a decimal digit
jb 130 ;otherwise, return 0
cmp bl,39 ;don't allow spaces or tabs in input ...
ja 130 ;known as "user hostile" programming
and bl,0f ;mask off high byte ...
mul dh ;multiply current value by 10 ...
add ax,bx ;and add in this digit
cmp ax,100 ;make sure we don't go over the limit
jnc 130
loop 135 ;repeat for each byte of input
mov ah,4c ;return function, gives AL in ERRORLEVEL
int 21
ret ;error exit, nothing placed in ERRORLEVEL

```

Listing 9. MCHOICE.ASM. An assembly language program that you can use in a batch program using ERRORLEVEL (see Listing 11).

# ASSEMBLY LANGUAGE

```
@echo orr
peek f000:ffff
if errorlevel 255 goto pc
if errorlevel 254 goto xt
if errorlevel 243 goto pcjr
if errorlevel 252 goto at
if errorlevel 251 goto xt
echo I don't know what the heck I am!
goto exit
:xt
echo I'm XT compatible.
goto exit
:at
echo I'm AT compatible. Top of the line.
goto exit
:pcjr
echo I'm an orphan. My name's PC-Jr.
goto exit
:pc
rem First, see if it's a Tandy 1000 series
peek fc00:0
if errorlevel 34 goto oldIBM
if errorlevel 33 goto t1000
:oldIBM
echo I'm just an old-fashioned PC.
goto exit
:t1000
echo I'm one of Tandy's 1000-series
computers.
:exit
```

Listing 10. WHATARYU.BAT. A batch program, using PEEK.ASM (see Listing 8), that tells you what kind of computer you have.

```
@echo off
:mainmenu
rem first, clear the screen
cls
echo MAIN MENU
echo
echo 1. Copy the disk in A: to B:
echo 2. Format the disk in B: as a DATA disk
echo 3. Format the disk in B: as a PROGRAM disk
echo 4. Run a program
echo 5. Exit to DOS
echo
mchoice Well, what are you going to do, Bimbo?
if errorlevel 6 goto sorry
if errorlevel 5 goto msdos
if errorlevel 4 goto program
if errorlevel 3 goto forprog
if errorlevel 2 goto fordata
if errorlevel 1 goto diskcopy
:sorry
echo Sorry, Bimbo, that was not on the menu!
pause
goto mainmenu
:msdos
echo OK, Bimbo, I sure hope you know what you're
doing.
goto exit
:program
rem replace this with the program name you want
Bimbo to run
gwbasic
goto mainmenu
:forprog
format b:/s/v
goto mainmenu
:fordata
format b:/v
goto mainmenu
:diskcopy
diskcopy a: b:
goto mainmenu
:exit
```

Listing 11. BIMBO.BAT. A batch program, using MCHOICE, that acts as a menu for your IBM compatible.

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*Continued from page 6.*

zine's title would suggest, you would be best prepared to batten down and expect to hold only a small share of the marketplace. I suspect that some of the reasons you don't have every Model 100 user as a subscriber varies widely. Some that come to my mind are:

- 1) Lack of useful articles and programs. Many of the programs either conflict with the "big-hitters," like *Super ROM*, or are better provided by the ROM chip programs. Some are so specialized they are purely educational reading, with no practical use for the multitude of average users.
- 2) Quality of photography and paper. In all fairness, the quality has improved measurably since I subscribed a year ago. *PCM*, it ain't! Still, a worthy improvement. Now, if you could only get more photos, and more importantly, more photos that print clearly!
- 3) Lack of interest. Do you know anyone who shares an interest of yours, but isn't as intense about it? That describes 80% of computer users in this country! A lot of people use their "thing" to get some work done, and then put it away. A means to an end. A tool. These people won't subscribe to your magazine just as Mr. Winter suggests. Unfortunate, but true for all

special interest magazines.

- 4) Too specialized in topic. You have made great strides in trying to introduce MS-DOS Tandy systems. However, it appears that you are at a crossroad and are indecisive as to whether to cross. Should you venture into the realm of non-Model 100 or not?
- 5) The unit itself. The Model 100 reminds me of brussels sprouts. They're good for you, but you either like them a lot, or you don't like them at all! The Model 100's idiosyncrocies can drive a man insane.

As I said in my opening paragraph, I wasn't going to make anyone happy with my observations and opinions. Putting biases aside, how do you make the Model 100 more than what it really is? Are there any vendors willing to either redesign the unit or come up with new peripherals? Is it already too late and this is an academic argument? I don't believe anyone can justify new tooling or products for the Model 100. Unless the obsessive prices for the available peripherals drop drastically in price, I see not only no future for the Model 100, but also a slow and agonizing death. This would be a sad shame.

Paul M. Bucalo  
Norwich, NY

*Sorry to hear you had so much trouble*

*with your Model 100. Many people have worse problems with their MS-DOS machines, especially software that requires more than their computer can provide, such as five megabytes of disk space for Word Perfect. (Won't exactly fit on a dual drive floppy machine, will it?)*

*We never said we were hesitant about adding MS-DOS coverage. When we originally took over the magazine, we intended to cover only Model 100 related topics. Unfortunately, there simply isn't enough of an advertiser base to keep the magazine in operation. So, we added Tandy MS-DOS portables to our coverage. With their advertising we can sustain the publication and support the Model 100 readers. Not as much of each issue is about the Model 100, but then again, the magazine is bigger. Total number of pages going to Model 100 topics has remained the same.*

*As for your other observations, I have known for years that only deeply interested people subscribe to computer publications. How else do you explain the fact that all computer magazines combined have fewer than three million readers while the computer industry has produced over 80 million machines? I liken the situation to the car magazines. Millions of drivers, but only a small number subscribe to Car & Driver. Thanks for writing.*

-tk



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

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

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

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

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

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

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

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

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

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

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

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

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# The Difference Betwixt *BASIC* Interpreters, Compilers, and Translators

*Small differences make a big change in results.*

by Jake Commander

**T**his column inaugurates a series of encore presentations from the dawn of *Portable 100* magazine. The information is still timely and interesting. So relax and enjoy this golden oldie, written by one of the true computer geniuses of our time.

The Model 100, amongst its innards, contains a *BASIC* interpreter. To me and presumably many other people, this is the single most powerful application provided in ROM.

But was using an interpreted language the wisest choice? What are the advantages with, say, a compiler? Could a compiler have been provided instead? And what the heck is the difference between a compiler, an interpreter, and a translator? In this article I'll be presenting a picture which hopefully will clear up the confusion.

## INTERPRETERS

An interpreter is a computer program. Its sole function is to scan instructions, usually in the form of ASCII text, and take action according to each one. This process is inherently slow because the interpreter has to lexically scan the text and try to make sense of it piece-by-piece. It does this by expecting the programmer to use a certain syntax containing the equivalent of nouns and verbs or subjects and objects.

This process involves scanning its internal dictionary to see if a word is in its vocabulary, and then jumping to a predetermined routine to do some work. If the syntax is wrong, the interpreter has no way of knowing what to do. So it does the only thing it knows: Stops dead with an error report.

This process continues all the time with the interpreter following the code

like a train running along tracks and switching when told to do so. The form of syntax it follows comprises the language used (*BASIC*, in the case of the Model 100).

## STRAIGHTFORWARD

Although an interpreter's main drawback is its slowness, the good thing about it is its high degree of interaction with the user. Since the routines following the interpretation already exists in a debugged form in ROM, the only crashes that can occur can be handled in a user-friendly manner.

Not only that, but the error report can be generated in the program at the exact point the error occurs. This helps debugging greatly by leaving an ailing program in the state it was just prior to the bug. Thus, it's a direct process to trace the flow of code to see what went wrong and where.

## COMPILERS

The difference between compilers and interpreters is compilers read the text of the program. Instead of executing the program, as the interpreter does, it generates code (normally machine code). This code can be run independent of the compiler.

That's the theory anyway. In real life, the compiler usually leaves some of itself behind. The "some of itself" left behind contains many routines to be used to help the generated code perform its work. I'll contain things like floating point math routines, probably containing all the code for transcendental functions like sine, cosine, and tangent. The whole slew of routines is referred to as a run-time library and is always present in

some form or another when the compiled object code is produced.

This explains one of the drawbacks of compilers: The machine-code program produced can be larger than the source code text because of the size of the run-time library. Not only that, but some vendors of compilers require a royalty on any object code you sell because it contains a great deal of their own code. Why this should be treated any differently from similar routines present in an interpreter is a mystery.

## DRAWBACKS

The obvious advantage of a compiler is speed of execution. Most generate a machine-code program as their output resulting in code running at machine-code speed with no interpreter having to scan and analyze anything.

One caveat to this, thought, is no compiler is capable of producing code as compact and efficient as a human programmer can. Machine-code programmers' jobs are still safe despite the attraction of generating machine code with a compiler.

There's another disadvantage with a compiler. Instead of executing code with simple run command, or equivalent, a two-stage process has to start.

## RISKY RUN

First, the compiler has to read the source code in order to generate the object code. This is the stage when any syntax errors will be reported. Depending on the type of error, the compiler may continue producing object code after giving a warning, or it may abort altogether rather than produce code which won't work.

*Continued on page 28.*

COMPATIBILITY: Tandy 100, 102 computers.

# Poking Into TELCOM And BASIC

*Modifying TELCOM and BASIC to make them friendlier.  
Plus, recovering data lost in a cold-start.*

*by Terry Kepner*

**T**ELCOM has been criticized because it doesn't automatically send a linefeed character with each carriage return character it transmits. This causes the receiving computer to display each line on top of the previous line, making them difficult, if not impossible, to read. This is especially true of files you want read by other word processors or line editors.

This POKE will cure that complaint and force TELCOM to include a linefeed character with each carriage return it transmits. To implement the POKE, go into Model 100 BASIC and type POKE 63066,1.

To remove the automatic carriage return/linefeed combination, type POKE 63066,0 in BASIC.

Another useful TELCOM alteration lets you get a list of the files currently in RAM. This POKE makes either the F6 or F7 function keys act like the F1 button does in BASIC: it prints a list of the RAM files on the display (this list is not sent out to the other computer while you are in TELCOM; it is displayed only on your LCD). If you want to use the F6 key go into BASIC and type POKE 64268,58 :POKE 64269,31. If you want to use the F7 key type POKE 64270,58: POKE 64271,31.

When you select this function while in TELCOM, the cursor will display the filenames, then drop to the next line and wait for you or the

other computer to type something. This presents the files in a clean format.

Hand-in-hand with this modification is one that tells you how much free RAM (Random Access Read/Write Memory) you have left for downloading information from the other computer. Like the previous

---

**While in TELCOM,  
the cursor will  
display the  
filenames, then  
drop to the  
next line**

---

alteration, you can assign this function to either the F6 or F7 function keys. While in BASIC type POKE 64268,172: POKE 64269,126. If you want to use the F7 key instead of the F6 key, type POKE 64270,172:POKE 64271,126.

Unlike the previous alteration, this one doesn't automatically posi-

tion the cursor on the next line after displaying the number of free bytes. Anything you type, or any data sent by the other computer, will start immediately after and on the same line as the byte count information.

Yet another TELCOM alteration will let you assign a "clear screen" routine to either the F6 or F7 key. With this function in place, pressing the function key will clear the TELCOM screen and place the cursor in the upper-left corner of it. This is handy if you want to get rid of confusing information before continuing with your next communication task.

To use the F6 key go to BASIC and type POKE 64268,49:POKE 64269,66. If you want to use the F7 key type POKE 64270,49:POKE 64271,66.

As you may have noticed, there are only two available function keys in TELCOM while there are three possible alterations. I've found a way to combine several features into only two function keys: F6 and F7. Previously you had to choose two of these three possibilities: a clear screen, a files display, or a free RAM count—and without removing any RAM from normal program use.

This little two-line BASIC program assigns the "clear screen" command to the TELCOM F6 function key, and combines the files display and free RAM count into one TELCOM function key: F7.

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As a plus—instead of leaving the cursor at the end of the free RAM count, as the previous *POKEs* did—this program's *POKEs* fix *TELCOM* so the cursor remains on the line below the free RAM count. This makes for a cleaner and more legible display as you continue telecommunicating.

The program works by taking advantage of the fact that each of *BASIC's* function keys is allocated 16 bytes of RAM, no matter how much you actually use. Well, *BASIC* function key *F8* is assigned the command *MENU*. Pressing this while in *BASIC* will return you to the Model 100 main menu. This command uses only five bytes of the sixteen allocated (the fifth byte is a carriage-return that terminates the *MENU* command), leaving eleven bytes, which just so happens to be one byte longer than I need for my *TELCOM* modification. My program defines the *BASIC F8* key as the command *MENU* followed by a character string that includes the machine-code for calling the *FILES* function, determining the free RAM and then sending a carriage-return/linefeed to the display. This is followed by the *POKE* commands that tell *TELCOM* where to find this code in memory.

The second line of the program sets the *TELCOM F6* key to perform a clear screen.

For you techie types, 205 is the machine-code equivalent of a call, and 201 is a machine code return. The other numbers in line 10 are the addresses called (in standard low-byte high-byte order). You'll note that there are three calls. The return, 201, sends control back to *TELCOM*. Otherwise the program would cause your computer to crash, and possibly force you to cold-start it and lose all your programs.

Naturally, if you cold-start your computer, or use a program that

changes the assignments of the *BASIC* function keys, you will lose the *F8* key code my program put there. If you try to use the *TELCOM F7* key after this has happened, you might crash your computer as it tries to execute the non-existent code in *BASIC* key *F8*.

I suggest that you type in the program, run it, then save it to cassette so you can easily reload it in the event the *BASIC F8* key is reasigned.

## You'll note that there are three calls.

```
10 KEY8,"Menu"+ CHR$(13)
+ CHR$(205) + CHR$(58) +
CHR$(31) + CHR$(205) +
CHR$(172) + CHR$(126) +
CHR$(205) + CHR$(34) +
CHR$(66) + CHR$(201): POKE
64270,127: POKE 64271,248
11 Rem set TELCOM F7 key
to display files, display
free ram, and perform a
CR/LF
12 POKE 64268,49: POKE
64269,66
13 rem set the TELCOM F6
key to perform a clear-
screen command.
```

### BASIC MODIFICATIONS

Occasionally you'll want to protect a program from accidental "lockup" (such as pressing the *PRINT* function key when you don't have a printer attached). The normal

## PROGRAMMING

way of recovering from this is to press the *BREAK* key. Unfortunately, this crashes your program and could also lose your data—a certainty if you have to re-run the program.

This *POKE* disables the *PRINT* key, and also makes the *BASIC* ignore *LPRINT* statements: in *BASIC* type *POKE 64228,136:POKE 64229,20*. When you are ready to use the printer, just type *POKE 64228,243: POKE 64229,127*.

To make this an automatic operation, you can use this statement to test the printer port for a printer *IF (INP(187) AND 6) <> 2 THEN POKE 64228,136:POKE 64229,20:ELSE POKE 64228,243:POKE 64229,127*.

If *INP(187) AND 6* equals two, the printer is attached and ready to go. If it equals zero the printer is attached but not ready. And if it equals six the printer is not attached.

### MORE POKES

Occasionally, if you write your own *BASIC* programs, you yearn for a few simple commands to jazz up your program a bit. But you don't want to add anything long—after all, space is at a premium in a portable. Here are four suggestions.

Here is a *POKE* that lets you turn on the reverse video characteristics of the Model 100 LCD display: *POKE 63048,1*. Restoring the display to normal is just as easy: *POKE 63048,0*. The first *POKE* takes the same amount of room as the standard method of enabling reverse video: *PRINTCHR\$(27)"p"*. But the second *POKE* is actually shorter than the normal method of turning it off. Both are slightly faster than their *PRINT* equivalents. No matter which method you use, returning to *MENU* turns off the reverse video.

Another feature you might want to consider is the *LABEL* line which you can turn on and off with either the *LABEL* function key or the *SCREEN* command: *SCREEN,1* turns it on and *SCREEN,0* turns it back off. Occasionally you will design a program that pressing *LABEL* will ruin. Here is a *POKE* to prevent a user from pressing the *LABEL* key to turn the label line back on: *POKE 64173,0*. After this *POKE* is issued,



## PROGRAMMING

pressing the *LABEL* key will have no effect. If the label line is on, it will stay on. If it is off, it will stay off. To restore the *LABEL* key's access to *LABEL* line, type *POKE 64173,1*.

As with the reverse-video *POKE*, returning to the *MENU* from *BASIC* will automatically restore the *LABEL* key's function.

Frequently, when you are trying to design a menu screen for the LCD, you want to know just where the cursor is before you let the program start sending information to display. *PEEK(63040)* will tell you the current line that the cursor is sitting on, and *PEEK(63041)* will tell you the horizontal print column occupied by the cursor.

Here are two locations that will tell you where the information you want to display is going to end up on the LCD: *PEEK(63033)* will tell you the next line to be used on the display (one is the top line, eight is the bottom line); and *PEEK(63034)* will tell you the next horizontal print position, or column, that will be used (starting with column one on the left and running to column 40 on the right).

Associated with these two positions in memory are two others that programmers can have a lot of fun using. The first, 63035, can be used to protect the bottom lines of the LCD from the cursor. For example, *POKE 63035,4* will prevent the cursor from going below the fourth line of the display. In other words, you could put information on line seven of the LCD and use this poke to prevent it from being overwritten as the screen fills up.

Similarly, you can protect the right side of the display from being used by typing *POKE 63036,20*, effectively reducing your display size to eight lines by 20 columns! As with the other *POKEs* in this column, returning to *MENU* resets them to their normal values (eight and 40, respectively).

### NOT SO RANDOM

As you may know, the random number generator in the Model 100 always starts with the same number (that is, typing *PRINT RND(1)* always gives the number

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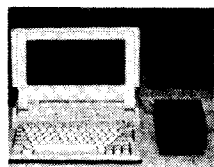
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.59521943994623 the first time, .10658628050158 the second time, and so forth). If you've written games for the Model 100 that use this function, or if you need the function for numerical analysis, the fact that you always start with and keep the same numerical progression is a frustrating fact. Here are some suggestions to solve that problem.

The most obvious method is to use the *INKEY\$* function in a loop, continuously calling the *RND* function until the user presses a key. The amount of time it takes the user to react to the prompt *Press any key to continue* will be a random factor, preventing the user from starting with the same sequence more than once. Here is an example:

```
10 PRINT "PRESS ANY KEY TO  
CONTINUE":A=RND(1) :A$=INKEY$  
:IF A$="" THEN 10
```

The problem with this technique appears when the person using the program takes advantage of the fact that the Model 100 will store keystrokes before they are used. For example, if a program has this *INKEY\$* routine as the first line, the user could type *RUN* and hit *ENTER* twice, rapidly. The first *ENTER* would start execution of the program; the second one would be stored in the keyboard buffer. When the *INKEY\$* loop is reached, the previously stored *ENTER* is immediately given to the *INKEY\$* command and the program continues after calling the *RND* function only once. A

clever user can then start with the same numerical sequence. This technique is still useful in some situations.

Better and faster results can be obtained by just inserting *POKE 64634,PEEK(63791)* into your program. This will start the random number generator with one of 125 values.

A much better approach, for those situations requiring higher odds, is to go directly to the random number seed at locations 64634-64639 and fill them with a series of numbers that are themselves a random set, or at least will appear to be random.

One way to do that is to read the current date and time from the computer's memory and put them into the random number seed locations. Because the clock is always ticking and time continuously moves forward, the only way to get the same sequence twice would be to set the date and time functions to a predetermined value, and immediately call the program that transfers this information to the random number seed—which means your user would have to stop your program, set the date and time, then continue the program from where it was interrupted.

Putting the time and date into the random number seed locations will give roughly 31,536,000 different starting numbers, one for every second in the year. It's easy to do once you know the locations in memory of

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the time and date. Here's a one-liner that does just that:

```
FOR A=0 TO 4 :POKE A + 64634,
PEEK (A*2 + 63795) + PEEK (A*2
+ 63799)
```

Hopefully, these suggestions will make it easier for you to design efficient and fast programs for your Model 100.

### DATA RECOVERY

You sit there stunned. All your programs, all that data is gone. Erased. Poof. It happens when you least expect it—usually when you are trying a new machine-language program for your Tandy. Suddenly, for no apparent reason, the unit resets itself to its original power-on state. That is, the date resets to Jan 1, 1900, and the menu indicates you have no files in memory at all.

Or do you?

It turns out that your computer really hasn't forgotten everything. It just reset to zero certain pointers in the menu area of RAM that tell it where your data was. Now, if you could somehow go into RAM without disturbing anything there and reset those pointers, you could get back your previous data without having to re-key it back into the computer.

You can recover that data. The technique takes advantage of the unusual memory structure of the Tandy Model T and the ability of BASIC to treat RAM as just another peripheral to which to send data.

As you type in a command to BASIC, the operating system stores what you type in a keyboard buffer in high RAM. When you press ENTER, the operating system looks at what you typed and decides if it is a direct command or a program line (program lines start with numbers). If it is a program line, it is stored in RAM at the lowest available address, erasing what was there previously.

If, on the other hand, it is a com-

**Your computer  
really hasn't  
forgotten  
everything.**

mand, then the line is transferred to an execution buffer and executed without disturbing low RAM (except as the command instructs).

This makes possible a one-line save-your-soul program that can read the RAM of your 32K Model 100/102 (if you have a 24K machine, use X=40962) and restore it, byte by byte:

```
OPEN "FIND" FOR OUTPUT AS 1
```

```
: FOR X = 32770 TO HIMEM :
PRINT#1, CHR$( PEEK(X)); :
NEXT
```

This program PEEKs at each RAM location, reads the information stored there, and writes that piece of data on top of itself, updating the relevant memory pointers as it does so.

In the Kyocera computers, RAM starts at the memory position and goes up to a maximum of 65535. For the Tandy 100, there is a pointer called HIMEM that tells the computer just how much RAM is installed in the computer.

If you have a full memory machine, the start memory address you use depends on which machine you have. A 32K Tandy 100 or Tandy 102 starts at 32767. A 24K Tandy 100 or 102 starts at 40959.

Now, after running this program, you will have one huge file named FIND.DO that is as large as all the RAM available in your computer. Because the files you are trying to recover didn't take up all the RAM in your computer, this file has a lot of useless information at its end that you can erase. This will give you room to transfer data out of the FIND file. So, go into the file, go to the very end of it, and start erasing the useless information.

You will discover that your BASIC programs can't be recovered without a lot of work. BASIC programs are stored in memory in a shorthand that can't be merged back into BASIC from a document file. But your document files should be easily available for your use.

Finally, if you have a tape recorder and want a record, you can save the FIND file to tape by typing (if you have a 24K machine, use X=40962):

```
OPEN "CAS:FIND" FOR OUTPUT
AS 1 : FOR X + 32770 TO HIMEM
: PRINT#1, CHR$( PEEK(X)); :
NEXT
```

This allows you to peruse your files in RAM, reassured that if you make a mistake in the recovery you can reload the file from tape and try again.



COMPATIBILITY: All computers.

# Power Star to Keep in Your Car

*Keeping your battery charged while on the road makes your portable computer a traveling workhorse.*

by Bob Liddil

**I**t was a dark and stormy night. The DC power cord had been left at home. The butler, riding shotgun with *Automap* loaded onto his trusty Tandy 2820 HD, had just realized that (A) the on-board batteries were flatter than old ginger ale, (B) we had no paper backup maps, and (C) we were about to run out of gas and had no idea how far away the next town might be. There we were, entering the mountaintop village of Florida, Massachusetts, in a downpour of sleet, snow, ice, and frozen frogs, with no way to access the computer, when suddenly, it dawned on me. Back at the office, prior to this ill-fated trip, a really nifty gadget had come by UPS. A Powerstar Products Incorporated POW 200 had arrived, courtesy of Solarmetrics, in Manchester, NH. By a small stroke of luck, Terry had shoved it into my computer case, mumbling something about, "See if you can find a way to test this, wouldja?" Oh my, yes, indeed I would.

The Powerstar POW 200 is a DC to AC inverter. Simply put, it converts the DC power coming from your car battery to the AC that you would normally in your house. My particular test inverter was the 200 watt version, which happens to be more than enough to drive the 2820, hard drive and all.

It is a compact device, a mere 5 inches by 2.6 inches by 1.7 inches (roughly the size of a microcassette tape recorder), with a cigarette lighter pigtail on one end and a three-pronged socket on the other. It weighs less than a pound. Basically, it is an unobtrusive little black box that remains pretty much invisible until you need it. But when you need it, oh boy.

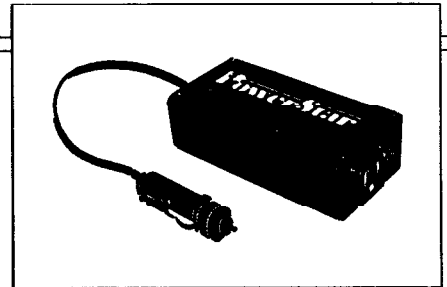
From an input of 10 to 15VDC, the PowerStar has a capacity of 140 continu-

ous volts of AC with 400 watts peak and 200 for two minutes, an easy loaf for the roughly 47 watts of draw from the computer. It outputs 115 volts AC true RMS (plus or minus 5 percent). To put all this technosnarfle into English, a 13 inch color TV (which draws about the same power as one headlight) can operate about six hours from the car battery without the motor running. The 2820 IID computer would last approximately two hours more than that, and a Model 100 would last until the end of the car's warranty (or thereabouts).

In the snow, sleet, etc., running lights, wipers, defroster, heater, radio and PowerStar (as we climbed the last hill into Florida and started downward toward North Adams (which *Automap* said would be at the foot of the hill)), the reassuring blue display on the navigation computer contrasted sharply with the sight of cars and trucks off the road. By the time we got off that mountain, the PowerStar had done a fair job of reaffirming my faith in electronic devices and power inverters in particular. As we pulled into an open CITGO station for gas, I whispered a silent "Thank you" to Earl Farley from Solarmetrics.

An expanded use for this unit would be employing a strictly AC powered device, such as a Weltec Multimate hard disk drive, in an environment such as a sailboat or motorhome. Or it could just as easily drive a CD ROM reader and an extra monitor, just by asking. Overload it and it shuts down, resets and tries again. It has the guts to take on odd challenges and please its user easily.

Anyone using recreational vehicles of any kind, whether boat or land vehicle, can find room for this useful and compact little power box. Also, the computer



doesn't seem to pick up as much motor static when using the inverter, and that's reason enough for its use.

When I got home that dark and stormy night, after dropping off the navigator, then putting away the car, I remembered that I'd left the PowerStar attached to the lighter socket in the Camaro. When I went back out into the muck to retrieve it, I found it was gone. Stolen? Oh no! How could this be? Dejectedly, I went back into the house only to find it laying on the dining room table with a note attached, requesting to borrow it for next week's vacation. How did it get there? Who was the mysterious borrower that seemed to know all about how to use it?

It was the butler. The butler did it.

## MANUFACTURER'S SPECIFICATIONS

PowerStar Model POW200 — \$129  
manufactured by PowerStar  
Products Incorporated

Distributed by  
SOLARMETRICS,  
140 Bouchard Street  
Manchester, NH 03103  
Phone (800) 356-4751  
(603) 668-3216

COMPATIBILITY: MS-DOS computers.

# DOS For Dummies: A Book for Users, Not Hackers

*This book helps you cut down on DOS MS-takes*

by Bob Liddil

**A**n old computer cartoon reads: "C:Dos, C:DOS RUN, RUN DOS RUN!" From that cartoon, one might get the mistaken idea that the disk operating system that made Bill Gates a zillionaire and Microsoft a Fortune 500 company is easy to use. It isn't. But, with Dan Gookin's new book *DOS For Dummies* permanently in place on your desk, it can be.

This is one of those rare techno-books where you literally can't wait to turn the page. The author starts off with his tongue firmly planted in his cheek and keeps the reader laughing all the way. At the same time, he never loses sight of the real reason the reader is here, and that is to learn DOS.

A variety of topics are covered, from seemingly uncomplicated tasks (to the experienced user) such as turning the machine on, running a program, finding a directory, changing disks or disk drives, all the way through and including such dramatic revelations as, "Never use the DOS commands: ctty, debug, Fdisk, Format C:, and recover."

Although the author does not answer the question of life, the universe and everything, he does make the imponderable mysteries of DOS seem a little less galactic. Before reading this book, I always felt that understanding DOS was an infinite improbability. However, the author has offered explanations on how to find lost files, returning to your program when it crashes, how to avoid re-booting and losing your files when your computer goes catatonic. Many of the translations of DOS are worthy of a Babel Fish. Armed with this information, I am possessed of a new attitude, "Don't Panic." Of course, *DOS For Dummies* has an entire section entitled, "when to panic."

## The 5th Wave By Rich Tennant

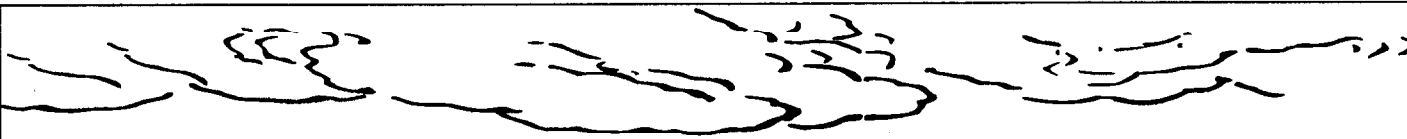


"OH SURE, \$1.8 MILLION DOLLARS SEEMS LIKE ALOT RIGHT NOW, BUT WHAT ABOUT RANDY? WHAT ABOUT HIS FUTURE? THINK WHAT A COMPUTER LIKE THIS WILL DO FOR HIS SAT SCORE SOMEDAY."

Seriously, and on one level this is an entirely serious book, *DOS for Dummies* is crammed with useful tidbits. For example, from Chapter 15, "When It's Time to Toss in the Towel," subheaded, "My computer's down and I can't get it up", comes the sage advice, "The first step is to analyze the problem. Break everything down and find out what is working. Even if you can't fix the problem, you'll be better prepared to tell an expert about it and have them deal with it." This is a much better way of dealing with computer crashes than my previous method which was the "pound on the table, swear like a sailor, evoke the curses of the old ones on the manufacturers of the equipment, then roll into a fetal ball and cry for your mommy" method. This chapter suggests checking cables for loose connections, (particularly those

hard working keyboard cable connectors), going down a checklist of symptoms in hopes of eliminating the obvious, and differentiating between hardware and software problems. It addresses the gut wrenching events surrounding a hard disk disappearance (as in, it was here and now it's gone. Not an uncommon occurrence). I never would have guessed that all IBM compatible computers have a built-in battery, never mind that an internal battery failure could cause the computer to forget where the hard drive is. Egad! According to this chapter, the age of a hard drive can also be a factor in having it suddenly disappear. In our enthusiasm for things technological, we sometimes forget that what spins, clicks, stops and goes, sometimes wears out. Recommendation: re-

*Continued on page 28.*



# What on Earth could they be thinking?

by Terry Kepner

I must admit, it's been a long time since I enjoyed such a good laugh after opening a software package. I had ordered it several months ago, from a prerelease promotional flyer I had received. It was pushed as the most extensive dictionary/thesaurus program on the market, with over 160,000 words in the dictionary program and 220,000 words in the thesaurus. These are rather impressive statistics, and I wondered how it would compare with the built-in dictionaries/thesauri of the word processors now on the market.

So, when it arrived the day before I left on Christmas vacation — to visit my wife's relatives in upper state New York, only fifteen miles south of the Canadian border — I was pleasantly surprised and looked forward to actually having some time to examine the package.

It came in a standard six by nine by two-inch mailing box, with the Random House logo on the front. I stared, stunned, at the contents after slicing open the sealing tape. Inside, in a plastic, heat-sealed bag, was a small five by seven booklet, not more than fifty pages thick, and *sixteen* 3.5-inch disks. That's right, *sixteen* 3.5-inch disks. That's when I started laughing.

Just what on Earth was on those disks? I mean, even *Windows 3.0*, with all the bells and whistles added, doesn't have even *half* that many disks. Not even the database programs, known for extravagant quantities of disks, require that many disks. In fact, the previous record for ridiculously excessive distribution disks was held by *Unix*, that massive operating system that came on forty or fifty 360K 5.25-inch disks, in uncompressed file format back in the early 1980's.

I recounted the disks, several times, and still came out with sixteen disks. I decided to check the manual; just how

much disk space did this monster take up? The absurdity of it kept me chuckling throughout my search.

Nowhere in all forty-eight pages does it tell you how much disk space is needed, although it proudly proclaims that it is a small TSR (Terminate and Stay Resident) program that requires only 10K of your valuable RAM! I came across this message several times.

I kept looking. Included with the package was a new set of promotional press releases. Buried on the back page of one of these, after yet another "Using only 10K of RAM..." was a sentence that said, "The 9.6 Megabytes hard drive file..."

---

**Nowhere in all  
forty-eight pages  
does it tell you  
how much disk  
space is needed**

---

Nine decimal six megabytes, 9.6 MB. People were staring at me as I roared out loud, laughing.

I showed the package to everyone else in the office. Stunned looks of disbelief, followed by howls of laughter. I showed it to the people in the mailing list business next door. More laughter. One woman said she used to work at NCR with *Unix*, and had thought nothing could possibly take up more space than that. As a matter of fact, our mailing list for the magazine is only six megabytes in size.

According to a portable computer magazine that shall remain nameless in these pages, out of the 104 hard-drive equipped portable computers on the market, sixty six come with twenty megabyte hard drives standard, and one hundred come with forty megabyte units. The high-performance units that come with sixty megabytes or more number fewer than ten.

I have *Bible Study* on hand. It provides the entire text of the Old and New Testaments in one and a half megabytes. The King James Version, The New International Version, and the American Standard Version, all together take only four and a half megabytes! Three different versions of the Bible, a complete concordance, and the Naves Topical Index still brings the total to less than six megabytes.

Let's see now . . . *Microsoft Word 5* requires two megabytes of hard drive space for the complete package (as does *Word Perfect*, *Word Star*, and most every other word processor on the market today), that is, I haven't stripped out the spelling checker or thesaurus and I have kept all the things they say you should.

Add in the operating system for another one and a half megabytes. Now I add in my *Writer's Toolkit*, with *CorrecText Grammar and Style Checker*, *Concise Columbia Dictionary of Quotations*, and *The Written Word III* (a style book that answers any question you may have on writing in the English language) — I stripped out the dictionary, abbreviation guide, and thesaurus — and that adds another five megabytes. Now load in this program. Hmmm, that takes up over eighteen megabytes. Ninety percent of my hard drive used up, and I haven't even written a single word yet!

And what about my other programs, not just my word processor utilities? I'm

*Continued on page 28.*

## GOOD MEMORIES

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Houston, TX 77052-3798

Add \$3 postage & handling. Texas  
residents add 7.25% sales tax. Send  
for our model 100 & model 200  
software catalog.

Circle 151 on reader service card.

# ROMBO

At last! An economical adapter that allows you to use stock EPROMS (27C256) in the option ROM socket in the Tandy models 100/102/200. They're reuseable too, no soldering necessary. Remove an EPROM in seconds, reprogram, and reinstall in the same ROMBO. "The best!"

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27C256 EPROM: \$6.50 ea.  
plus \$3 per order for shipping.

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## eme systems

voice: (510) 848-5725  
fax: (510) 848-5748  
2229 5th St., Berkeley, CA 94710

Circle 81 on reader service card.

Continued from page 27.

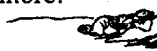
going to have to unload my two megabyte subdirectory reserved for my GENIE work. I'm going to have to unload *Automen* and *Menu Direct Gold* (800K). Out with my *PC-Tools* (two megabytes). Goodbye to my graphics program (four megabytes). And my solitaire! Oh, no, not that, too! It's only 150K, I think I can squeeze it in. But everything else must go!

Actually, I have a forty megabyte hard drive, not a twenty. But I also use the computer with *PageMaker* to put the magazine out. With *PageMaker*, and the other writing tools and utilities I mentioned above, I have less than nine megabytes left on my hard drive, even with a special software drive-squeezer installed. And when running *PageMaker*, trying to limp by with only two or three megabytes free is a real test of patience. The program slows down from slow speed to dead slow speed, emphasis on dead.

The *Random House Dictionary and Thesaurus* is inexpensive, remarkably so, only \$69.95. But consider that the average person has a vocabulary of only 30,000 words, that even the most widely read person knows no more than 50,000 words, and that most people use, actually use, only six thousand words on a regular basis.

Does something look wrong with this? Why am I picking up my Model 100 to take on vacation? Why is my 30,000 word pocket dictionary parked in the bag pocket over the Model 100, alongside the pocket thesaurus? And I won't even mention the WP-2 with its 100,000 word dictionary and 220,000 word thesaurus.

Could it be, that less is more?



Continued from page 26.

place the drive when it begins acting up. This is seen as a better course of action than losing data as a result of hard drive cardiac arrest. This book is chock full of neat information like this, information that would be invaluable to know at the same time something really bad happens, or even beforehand.

The bottom line on this 291 page book is an easy call. I like it. I recommend this book for other "DOS dummies" like myself or even "DOS savants" below the level of "Guru." *DOS For Dummies*, as a casual read, is a witty, oftentimes side-splittingly funny, cleverly disguised serious manual on DOS. It addresses the simple or complex with expertise and irreverence in equal doses, balancing the two to make the information palatable. I found this book to be easier to use than DOS manuals I've owned. Those books made me feel like a dummy. This one puts me firmly in control and allows me to drive. The index section in the back pages is crammed with easily accessible stuff I need to know. Owning this book will almost certainly make life with DOS more tolerable. I'm adding it to my permanent library.



### MANUFACTURER'S SPECIFICATIONS

DOS For Dummies, by Dan  
Cookin, 291 pages, ISBN 1-  
878058-25-8 — \$16.95 US, \$21.95  
Canada

IDG Books Worldwide  
International Data Group  
155 Bovet Road Suite 610  
San Mateo, CA 94402

Continued from page 20.

The source code is dumped back into the lap of the programmer. Once this initial compilation is successfully completed, the second stage can take place. Here the object program is run. Any logic errors in the program will cause a crash at some point. But this time it'll be at machine-code speed with no friendly interpreter to help with a cryptic message. Anything might happen: Wrong results to a system crash.

### TRANSLATOR

So what about this mysterious animal? It's just a generic term for any program that converts source code in one language to source code in another: *Pascal to Fortran* for example. Its main use is for rewriting programs in a language you intend to supercede. Once the translation is performed, the resultant code can be interpreted or compiled in the usual way.

The uses for such a program on a 100 are minimal. Though there's no reason why the machine couldn't perform any translation if you wanted to translate code for use on another machine.

### EASY WAY OUT

So could the 100 designers have gone with a compiler instead of an interpreter? Sure. Except with the wide user-base such a machine has attracted, the more interactive the programming language the better. Despite their drawbacks, interpreters offer the best lowest-common-denominator solution to providing a language on any machine. Good programmers can still make them perform with astonishing efficiency. So regardless of the fact I'd personally enjoy the use of a compiler on my 100, I'm secretly glad they provided the easy way out.



COMPATIBILITY: Model 200.

# SEARCH.CO

*Uncovering the mysteries of your Model 200's ROM.*

*by Paul Globman*

**D**EJA VU!! If the name of this column seems familiar, that's okay. We've been here before. Four years ago, beginning with the March '88 issue of *Portable 100*, CUSTOM 200 appeared monthly. The main focus of the column (at that time) was to explore the potential of cross-bank programming in the Tandy 200.

Today, the concept of cross-bank access (i.e., programs in the Tandy 200 having the ability to read from, write to, or switch to another RAM bank) is no longer new and untested. So, for the next couple of issues, this column will focus on some utilities to assist programmers and hackers.

## SEARCH.CO

One utility that most programmers find indispensable offers a way to search the ROM (or RAM) for a defined sequence of bytes. *SEARCH.CO* (see Listing 1) finds the locations of a defined byte sequence and displays the addresses where that sequence is found.

To use *SEARCH.CO* you must run a small BASIC program that defines the byte sequence. Such a program may be as simple as:

```
1 LOADM"SEARCH"
2 INPUT"Find";X$
3 CALL 63900,,VARPTR(X$)
```

This is fine if the string you are searching for is an ASCII string that can be typed in at the keyboard. But suppose you are looking for all occurrences of CALL 20353. Then line 2 would be:

```
2 X$=CHR$(205) + CHR$(20353
MOD 256) + CHR$(20353\256):
```

```
REMCHR$(205)=
CALL(op code)
```

Other variations of line 2 can be used to define the sequence of bytes you want to search for. For example, line 2 could be:

```
2 GOSUB 5
```

where line 5 defines a subroutine to generate X\$ using DATA statements or an input loop (end the program on line 4, using, for example, STOP).

```
1 *****
2 '* SEARCH.CO *
3 '* by Paul Globman *
4 '* Copyright (c) 1985 *
5 *****
10 FOR I = 63900 TO 63944
20 READ X:POKE I,X:SM=SM+X
30 NEXT
40 IF SM = 6705 THEN 60
50 PRINT"error in data":STOP
60 SAVEM"SEARCH.CO", 63900,63944
1000 DATA 78,35,235,237,235,33,0
1010 DATA 0,205,62,79,197,213,229
1020 DATA 205,17,110,225,209,193,204
1030 DATA 188,249,35,124,181,194,167
1040 DATA 249,195,62,79,197,213,229
1050 DATA 205,3,71,205,30,0,225
1060 DATA 209,193,201
1070 REM END OF DATA
```

**It is this kind of utility that let me explore the Tandy 200 ROM and uncover the bank-switching routines used in XOS.**

*SEARCH.CO* examines all of memory, from address 0 to address 65535, and displays locations of exact matches as in:

*in xxxxx in xxxxx in xxxxx*

where xxxxx is the decimal address of the matched byte sequence.

This is useful for locating text strings in the ROM that you may want your program to display, while keeping the byte count of your program at a minimum. It is exactly this kind of utility that allowed me to explore the Tandy 200 ROM and uncover the bank-switching routines used in XOS. Next time I will offer a more extensive programming tool.

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



**COMPATIBILITY:** All MS-DOS computers.

## DeskMate Meets RightWriter

(Too much jargon!)

by Linda M. Tiernan

**W**hew! In all the years I've used computers, I've never had a program as easy to install as this, with directions this straightforward. It must be a trick. This can't be a real program.

But it is! *RightWriter*, the grammar and style checker, is published by RightSoft, Inc., of Sarasota, Florida. The *DeskMate* (PC-compatible) version is available from Tandy (Catalog number 25-1300, \$79.95). It requires 512K RAM. And—even neater, in my opinion—it includes a "runtime" version, for which you don't need to have *DeskMate* if you have just a plain old MS-DOS computer. Your computer can "pretend" to have *DeskMate* while you're using *RightWriter*!

My computer has a hard disk, so I opened up RightSoft's manual (a sturdy paperback, about 200 pages) to the section on installing the program on a hard disk with *DeskMate*. I followed their simple direc-

I've never had a program as easy to install as this, with directions this straightforward.

tions exactly. I put in the 3.5-inch disk on my A drive, hit F7 and the choice *Install*, and let it talk to me. It showed me a screen that was not the one in the book (because *DeskMate* has updated since the book was printed), but I answered the right questions, and off it went.

A few short moments later, I was pressing any key to continue, and *DESK.PDM* had been added to the list of programs in my *PROGRAMS* box. I chose to display it (via F7 from my *DeskMate* desktop screen). Because it is already listed as a *DeskMate .PDM* program, I don't need to specify a path or starting commands—*DeskMate* knows better. It recognizes its own.

### THE SCREEN

Now *RightWriter* appears on my opening screen as a separate icon—a window display. It "adopted" all the files I currently have in *TEXT*, presumably because they all end in *.DOC*, so all I will have to do is tab to the *RIGHT* box, arrow down to the file I want checked, and hit *ENTER*. You can also simply choose *RIGHT* from the top of the box, and then choose the file you want to check later. (Note: If you delete a file from the *TEXT* box, it also disappears from the *RIGHT* box.)

Right up front, *RightWriter* warns you that it makes suggestions, not

P.O. Box [REDACTED]  
Peterborough, NH 03450  
October 24, 1991

Ms. [REDACTED]  
School for Lifelong Learning  
Elliot Hall, Keene State College  
Keene, NH 03431

Dear [REDACTED]:

As I mentioned in our telephone conversation, the textbook I wish to use in next semester's *Introduction to Cataloging & Classification* is not the one recommended on the syllabus. <<\_S3. LONG SENTENCE: 29 WORDS >> (You may have noticed that the syllabus says "Instructor may choose an alternate text." That was written with me in mind, I'm sure.)

The textbook I wish to use is *Introduction to Cataloging and Classification*, 8th ed., by Bobdan S. Wynar. It will be available the second week of December. The paperback edition costs \$32.50 retail and its ISBN is 0-87287-967-4.

Please order an instructor's copy for me when it is available, and pass this information on to the bookstore. The books may be ordered <<\_S1. PASSIVE VOICE: be ordered >> from the publisher: Libraries Unlimited, P.O. Box 2988, Englewood CO 80155-3988. Their phone number is 1-800-237-6124.

Thanks for your help!

Sincerely,  
[REDACTED]

\*\*\*\* SUMMARY \*\*\*\*

Overall critique for: C:\DESK\CATTEXT.DOC  
Output document name: C:\DESK\CATTEXT.out

READABILITY INDEX: 7.96

|        |       |       |       |       |         |
|--------|-------|-------|-------|-------|---------|
| 4th    | 6th   | 8th   | 10th  | 12th  | 14th    |
| #####  | ##### | ##### | ##### | ##### | #####   |
| SIMPLE | GOOD  | GOOD  | GOOD  | GOOD  | COMPLEX |

Readers need an 8th grade level of education.

STRENGTH INDEX: 0.76

|       |        |        |
|-------|--------|--------|
| 0.0   | 0.5    | 1.0    |
| ##### | #####  | #####  |
| WEAK  | STRONG | STRONG |

The strength of delivery is good, but can be improved.

DESCRIPTIVE INDEX: 0.31

|       |        |       |       |
|-------|--------|-------|-------|
| 0.1   | 0.3    | 0.9   | 1.1   |
| ##### | #####  | ##### | ##### |
| TERSE | NORMAL | WORDY | WORDY |

The use of adjectives and adverbs is normal.

JARGON INDEX: 0.00

SENTENCE STRUCTURE RECOMMENDATIONS:  
18. No Recommendations.

<< WORDS TO REVIEW >>

Review this list for negative words (N), jargon (J), colloquial words (C), misused words (M), misspellings (?), or words which your reader may not understand (?).

|                  |   |               |   |
|------------------|---|---------------|---|
| O. (?)           | 2 | P. (?)        | 2 |
| S. (?)           | 1 | alternate (?) | 1 |
| bobdan (?)       | 1 | elliott (?)   | 1 |
| englewood (?)    | 1 | isbn (?)      | 1 |
| keene (?)        | 2 | ##### (?)     | 1 |
| lifelong (?)     | 1 | not (N)       | 1 |
| petarborough (?) | 1 | ##### (?)     | 1 |
| semester's (?)   | 1 | syllabus (?)  | 2 |
| ##### (?)        | 1 | wynar (?)     | 1 |

<< END OF WORDS TO REVIEW LIST >>  
<<< END OF SUMMARY >>

Figure 1. A typical business letter. The blacked-out items are personal names, which RightWriter doesn't understand.



IX. Well, tell me. Am I wrong? What DOES the public want? What is the library of the future, or is there one? Will libraries cease to exist, to be replaced? << S1. PASSIVE VOICE: be replaced >> by pay-by-the-question information services, professional storytellers, and the elementary-school secretaries taking care << S15. IS THIS ABBREVIATED school secretaries taking care >> of the books in her [ha ha] << G13. REPEATED WORD >> spare time? << G3. SPLIT INTO 2 SENTENCES? >> << S3. LONG SENTENCE: 33 WORDS >>

If there are people out there who love reading and libraries and use their services, and feel that libraries are important, they should say so, and they had better start saying so mighty damn << U1. COLLOQUIAL: damn >> quick. << S3. SPLIT INTO 2 SENTENCES? >> << S3. LONG SENTENCE: 35 WORDS >> Otherwise you will watch libraries go the way of the dodo and the mammoth. Don't say you weren't warned. << S1. PASSIVE VOICE: weren't warned >>

<< SUMMARY >>

Overall critique for: C:\DESK\LIBRARY.DOC  
Output document name: C:\DESK\LIBRARY.out

READABILITY INDEX: 7.94

|        |       |       |       |       |       |       |       |       |       |         |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| 4th    | 5th   | 6th   | 7th   | 8th   | 9th   | 10th  | 11th  | 12th  | 13th  | 14th    |
| #####  | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | #####   |
| SIMPLE |       |       |       | GOOD  |       |       |       |       |       | COMPLEX |

Readers need an 8th grade level of education.

STRENGTH INDEX: 0.47

|       |       |        |
|-------|-------|--------|
| 0.0   | 0.5   | 1.0    |
| ##### | ##### | #####  |
| WEAK  |       | STRONG |

The writing can be made more direct by using:

- the active voice
- less wordy phrases
- fewer weak phrases
- more common words
- more positive wording
- less slang

DESCRIPTIVE INDEX: 0.45

|       |       |        |       |
|-------|-------|--------|-------|
| 0.1   | 0.5   | 0.9    | 1.1   |
| ##### | ##### | #####  | ##### |
| TERSE |       | NORMAL | WORDY |

The use of adjectives and adverbs is normal.

JARGON INDEX: 0.00

SENTENCE STRUCTURE RECOMMENDATIONS:  
15. No Recommendations.

Figure 2. Speech notes. Odd sentences, bad attitude; and RightWriter comments on both.

demands. It does not change your original file. Instead, it creates another file with the same name, but with the extension .OUT. This file contains comments it makes along the way regarding your work, and finishes with Readability Index, Strength Index, Descriptive Index, and Jargon Index. It makes sentence structure recommendations. Then, it lists words to review, a list of items it did not understand or that might be open to several interpretations.

You, the user, run your .DOC file through RightWriter, using the Analyze Document command (F3/Analyze from the RightWriter program OR CONTROL-A from the RightWriter program OR highlight the .DOC file you want analyzed from the RIGHT box in DeskMate). It creates the .OUT file for you to examine with the TEXT program.

### LEFT OUT

One small nuisance, right here, is that because the resulting file has an .OUT extension, it won't show up in your TEXT window! Only .DOC files do. You have to know what you're looking for when you call it up in TEXT. So you have to examine the F2 (Files) and Analyze box while you are still in RightWriter to be sure you have the name of the right .OUT file before you go, or else exit DeskMate to take a look. This is awkward.

This awkwardness also illustrates the

major difference between RightWriter and other grammar-checker programs: RightWriter is not an interactive program. Other grammar checkers keep you glued to your seat, because they stop at everything they think might be an error and ask you about it.

### YOU CAN COME UNGLUED

With RightWriter, you can leave your computer and come back to a completed file full of questions, which you can answer at your leisure. You don't have to make on-the-spot decisions. You can make a print-out, to take off somewhere with a blue pencil, and come back later to make some changes—or not make them—after some thought.

It seems to be a matter of taste, judging by whom I've talked to. (Hm. Wonder what RightWriter would do to that sentence?) Then, after

making the changes you decide on with TEXT, you can ask RightWriter to go back through the .OUT file and "strain out" all the comments it inserted (using the Remove Comments command). It will take the .OUT file you indicate and turn it back into a .DOC file.

If your original text file is still listed, it will ask if you wish to overwrite it or create a fresh file. I did notice a few extra linefeeds at the end of this step. It was not clean, but it was easily fixed.

Figure 1 is a brief letter that I ran through RightWriter. As you can see, RightWriter's comments are separated from my original text by double carets and boldface. Immediately appended to my original work is a summary, listing the results of the letter according to RightWriter.

### COMPATIBILITY

I also tried RightWriter with another word processor besides TEXT. I called up the RightWriter program and pointed out the disk area and

subdirectory when I typed in the file name. Unless I countermand the original default positions, RightWriter automatically identifies the word processor of the document file in question.

Its corresponding .OUT file, also named and directed to a particular location by the user, will have comments indicated in the manner used by that particular word processor.

For instance, it examined a WordStar file for me. All comments and responses for were boldfaced à la WordStar, with all the proper CONTROL-PB characters. (My second illustration, Figure 2, is a portion of a set of notes I made for a speech. The grammar checker rightly disapproves of my half-written thoughts and bad attitude on the topic.)

RightWriter is fully compatible with 18 major word processors and can accommodate many more with a few minor adjustments. The minor adjustments are also described in the manual.

RightWriter boldfaces its comments, and also labels each with a code described in the manual in more detail. The general comment codes begin with C (capitalization), G (grammar), P (punctuation), S (style), or U (usage), and then a number, and the codes—praise be—are listed in the index.

```

<< S7. SENTENCE BEGINS WITH "BUT" >>
when I knew I had company. I was annoyed that anyone had the
<< S1. PASSIVE VOICE: was annoyed >>
nerve to tail me. I was also annoyed that I was being tailed by
<< S1. PASSIVE VOICE: was also annoyed >>
an amateur I could spot within two blocks. I deserved a little
more respect than that.
I turned the corner, but instead of ducking into the nearest
cave I reached upward. There was a decorative stone ledge
above my head. I grabbed it and pulled myself skyward. People
never think to look up.
My shadower rounded the corner, too, then came to a complete
halt. Either he had lost me or I was laying for him. Cautiously
he slid against the alleyway, waiting for me to peek out from
<< P3. IS COMMA MISSING AFTER CAUTIOUSLY? >>
around the next corner.
"Zinger, you boob," I said, and I jumped down on him, hard.
<< U1. COLLOQUIAL: boob >>
Zinger grunted and went down like a stone. Of course, I had
<< U1. COLLOQUIAL: grunted >>
hit him with both feet. I needed to; Silurians are practically
made of iron, even if they look like shortchanged lizards. When
<< S1. PASSIVE VOICE: are practically made >>
I hit a Silurian I always hit him with everything I've got. It's
<< P3. IS COMMA MISSING AFTER SILURIAN? >>
a good habit.
He was out cold. As I dragged him into the alley his head
rolled back and forth, and he groaned. I slapped his cheek
lightly. Zinger groaned again. "Death, you didn't have to do
that."
"Sure I didn't. You shadow me, you get what you deserve.
Out with it, Zinger. Why the spy routine?"
<< G2. IS THIS A COMPLETE SENTENCE? >>
He hauled himself to his feet. "Curiosity, mainly. I like
<< G2. IS THIS A COMPLETE SENTENCE? >>
to see what happens to my artwork."
"I told you."
"Balls. The worst word Zinger ever used. "You wouldn't
look at Anni because you didn't want to see what she looked like
alive. You were there to get the thrill, Death. What were you
doing, telling that crap about a client?"
<< U1. COLLOQUIAL: crap >>
I grimaced. I hadn't realized I'd been quite that
transparent. "Sorry, Zinger. You're right, of course."
"Want a drink to discuss it?"
"A drink? Are you kidding? You think I'm buying you a
<< U1. COLLOQUIAL: kidding >>
drink? Not a chance, Zinger."
<< G2. IS THIS A COMPLETE SENTENCE? >>
"Well," Zinger suggested, "it would give us a chance to
discuss this in private instead of having me wonder aloud whv
Moriah Death is into viewing fake dead bodies all of a sudden."
<< U21. NEGATIVE: fake dead >>
<< G5. SPLIT INTO 2 SENTENCES? >>
<< S11. IS SENTENCE TOO NEGATIVE? >>

```

Figure 3. Fiction. All characters don't speak perfect English, but I won't be forced to change anything.

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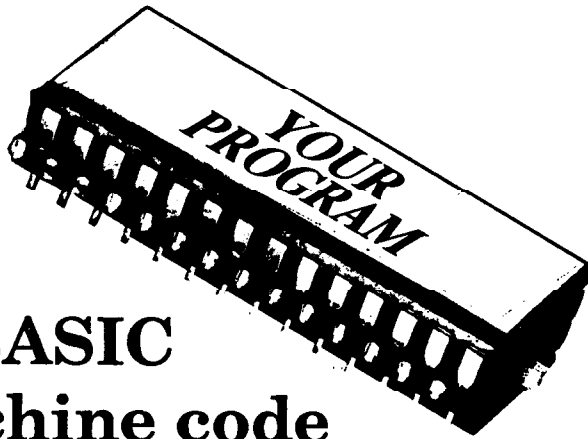
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As you become more conversant with the features of *RightWriter*, you can turn these rules on and off, depending on whether you find them useful. For instance, if you are writing an essay in the colloquial, perhaps you won't want a *COLLOQUIAL* note after every other word!

Figure 3 is an excerpt of another *WordStar* .OUT file, containing comments that I won't be changing, however much *RightWriter* disapproves, because they are part of the conversation of the characters in a fiction story. As the authors of the manual remind me often, just because *RightWriter* made a note, it does not force me to change the sentence.

### WHAT IT ADDRESSES

The notes placed throughout the examined text file are technical and mechanical. In contrast, the summary at the end answers the question: Am I reaching my intended audience? I may choose a writing style for which *RightWriter* examines my work: general public/high school/college education level; a type of writing designed for general business, technical, manual, proposal, or fiction.

The readability index tells me if my technical report requires only a third-grade reading level, which might be embarrassing. The strength index shows me if my delivery is too watery or too passive. The descriptive index highlights over-flowery unnecessary redundant verbiage. The jargon index points out my hackerism or other wirehead traits, if they show. Sentence structure recommendations are picked from a "laundry list" of fifteen or so possibilities. The summary wrapup consists of the words that *RightWriter* thinks I ought to consider—or reconsider. (This includes proper names, which of course it does not understand.)

Verdict? I like it. I won't follow all *RightWriter's* recommendations, but that's one of the recommendations, actually. I can probably make my fiction a little tougher and my reports a little more concise. It goes with *DeskMate's Text* (and also with *WordStar*) like apple pie and cheese. That well-known blue, black, and white package makes a welcome addition to the line of *DeskMate*-ready products available for Tandy and other MS-DOS computers.

### Manufacturer's Specifications

*RightWriter*—\$79.95  
RightSort, Inc.

Available from all Tandy/Radio  
Shack stores.

**COMPATIBILITY:** Model 100/102 and 200 computers.

# Better Letterheads, Part One

*Nuge looks at some design problems and solutions.*

*by Mike Nugent*

Last month we played with *Write ROM's .in xxxxxx* dot command, which lets you include other files within a document at printing time. With it, you can "boilerplate" frequently used phrases, paragraphs, spreadsheet data, even entire multi-page documents.

I mentioned then that it's well suited for producing letterheads, and I included an example of a simple one (*LHEAD.DO*) that showed how to automatically print the current day and date, and automatically center the text on the page. It's very straightforward and easy

**Don't despair.  
You can embed  
special characters  
in a text file.**

to do ... usually. But as you've seen (*SUPER HERO*, Dec. '91), things can become less simple when we start mixing different font sizes.

**THE FIRST PROBLEM**

That's what Gary Girth, hypothetical president of the hypothetical Wide Load, Inc., recently discovered. Gary decided to model his company letterhead after *LHEAD.DO*, using margins of 10 (left) and 75 (right), appropriate for elite font, which he prefers. He fired up *Write*

ROM, went to work, and in short order printed his first page.

Bummer!

Something was wrong. The text centered fine, the day and date printed correctly, and everything seemed okay. But something just didn't feel right.

After some head scratching, Gary finally put his finger on it: It was "correct" after all; it just wasn't very punchy. The company name should be more prominent, he thought. Since the name is "Wide Load, Inc.," why not print it double-wide? And why not do the whole letterhead in boldface type to make it really stand out?

Freshly re-inspired, Gary jumped back into his letterhead file ... and smack into his first problem.

He'd long ago programmed his *Write ROM* to use *CODE-e* (for "emphasized") to control his printer's double-strike mode. To put all his company info in boldface, he simply placed a *CODE-e* at the beginning of his letterhead (Fig. 1) and another after the phone number.

Then came the snag. None of his *PRINT Code* keys were programmed for double-wide! All were programmed for various favorite printer features, and he didn't want to change any of them. What could he do?

**STRANGE (EM)BEDFELLOWS**

He could study the *Write ROM* man-

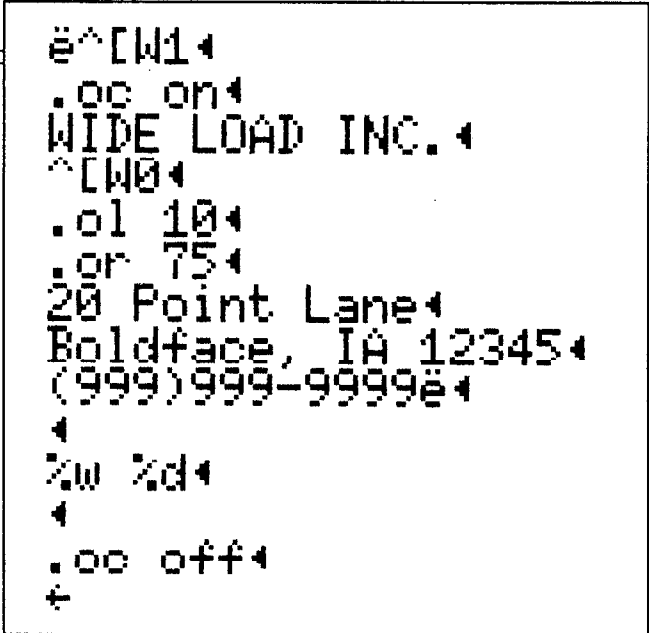


Figure 1. This sample letterhead uses two methods to control the printer: (1) via *Write ROM's PRINT Code* settings, and (2) by directly embedding printer control codes in the file.

ual, of course. And he did. And he learned that he could simply embed the desired printer codes right in the text file.

His printer manual showed the code for double-wide mode as *ESC W n* (where *n=1* for "on" and *n=0* for "off"). He figured all he had to do was press *ESC*, then *W*, then *1* (or *0*) to type the needed codes into the file.

He figured wrong.

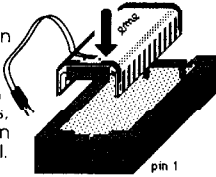
The Model T's *TEXT* program won't directly accept certain special characters known as "escape" and "control" characters. *TEXT* uses them for cursor movement and various other functions. For example, *CTRL-F* moves the cursor to the the next word in a file; *CTRL-A* moves it to the previous word. *CTRL-T* moves the cursor to the top of the screen, *CTRL-B* to the bottom. And so on. Press *ESC*, and nothing happens; press it a



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## SUPERHERO

```
.ol 5^
.or 38^
^ [W1^
.oc on^
WIDE LOAD INC.^
^ [W0^
.ol 10^
.or 75^
20 Point Lane^
Boldface, IA 12345^
(999)999-9999^
^
%w %d^
^
.oc off^
^
```

WAY1.DO

Page 1

Write ROM  
@PCSG 1985

Figure 2. To use double-wide characters, you must set new margins beforehand, and restore them afterward, as shown here.

second time and you'll exit the file and return to the main menu.

Don't despair. You can embed special characters in a text file. The procedure is described in both the Model T and Write ROM manuals, and Gary eventually found it. To save you the trouble, here it is: Just forewarn **TEXT** by pressing CTRL-P first, and then the special character.

To embed the ESC W 1 code to turn double-wide on, Gary first pressed CTRL-P to tell **TEXT** that the next character he typed (ESC) would be special. Next he pressed ESC, and **TEXT** took it without complaint, showing it on the screen as ^| (see Fig. 1). Then he simply pressed W and then 1. To turn double-wide off after the company name, he pressed CTRL-P, then ESC, then W, then

O. Problem solved.

Gary Girth was a groovin' guy now! He powered up the printer, punched PRINT, and promptly ... passed out.

(He obviously has a low frustration tolerance. We'll let him rest quietly for a bit, while we discuss what went wrong this time, why it happened, and how to fix it.)

### CHARACTERS PER LINE

Sure enough, the company name printed out in double-wide boldface characters as hoped. Problem was, it began way over on the right side of the page, and even wrapped around to the next line.

Gary forgot that different font widths produce different numbers of characters per printed line. When you print double-wide, only half as many characters can fit on a line! Since Write ROM determines margins by counting characters per line, you must remember to set new margins when changing to wider and narrower fonts.

One solution in Gary's case is to halve the normal margins for the double-wide section, as shown in Figure 2. The .ol 5 sets half the normal left margin of

10, and .or 38 sets half (roughly) of the normal right margin of 75. When Write ROM sends five spaces for the left margin, the printer prints five double-wide spaces, resulting in the same actual left margin that would be produced by printing ten spaces of normal size. With the right margin set to 38, Write ROM sends the printer only 38 characters per line, but printed double-wide they consume twice the space, resulting in the same actual right margin that would be produced by printing 76 characters of normal size.

Note that the original right margin of 75 is not evenly divisible by two. Using .or 38 gave the equivalent of a normal margin of 76; using .or 37 would have given the equivalent of a normal margin of 74. In either case, the right margin is off by one. This is usually not noticeable,

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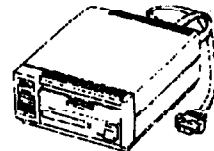
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Figure 3. This is the letterhead produced by the file in Figure 2. Note the extra blank line.

and you needn't worry about it. However, in a case where it's critically important, just use normal margin values that are evenly divisible by two, for double-wide or compressed fonts (or divisible by three, when using triple-wide fonts on printers capable of producing them, like the NEC P6).

Figure 3 shows the resulting printout. It's well centered, and the desired info is in boldface. (The inkjet printer that printed this example doesn't produce very dark boldface type. Other printers can produce more dramatic results.)

Notice that this method produces a blank line between the company name and the rest of the letterhead (plus a blank line before the name, which may not appear in the figure as published). Because the ESC W 1 and ESC W 0 are on their own separate lines, Write ROM sends these escape sequences to the printer, followed by a carriage return that advances the paper. If that's acceptable for your application, fine. If not, there are ways to get around it. They're a bit more complex than simply halving the margins, but they work well, and we'll discuss them next time around.

Meantime, let's just let Gary sleep. He's going to need it!



**COMPATIBILITY:** Tandy 100, 102, 200, NEC PC-9201A/8300, Kyocera KC-85, Olivetti M10.

## Ultimate ROM II, Part Two

Gene wraps up his head-to-head reviews of Ultimate ROM II and Super ROM

by Gene Wilburn

Last month I looked at *T-Word* and *ROMView-80*. This month you'll get a look at *T-Base*, *Idea!*, and the *TS-DO5* component of *Ultimate ROM II*.

### T-Base

In a previous column I stated how much I enjoy using the *Lucid* spreadsheet in *Super ROM*. Now I must state how equally pleased I am with the design of *T-Base*, the database module of *Ultimate ROM II*. Here is a nifty, relational database packed into a chip the size of a postage stamp.

Although there is a database module you can use with *Lucid*, I'm a traditionalist. I prefer to design data sets with field names, specific field lengths, and specific field types. If you're like me, you'll probably feel right at home with *T-Base*, its concepts being *terra cognita* to users of *dBase*, *FoxPro*, *Paradox*, and other such products.

Admittedly, the syntax of *T-Base* is a bit weird. To define a data set, you create its definition file using *TEXT* via a *T-Base* function. See Listing 1 for the definition of a simple mailing list data set. The first line denotes how many fields will be in the data set. The field names and their order follow. Then comes the on-screen prompt followed by the length of each field, followed by the type of field. In this simple example the *T* stands for text, or character, field.

Once a data set is defined, you exit *TEXT* and begin to enter data. For a simple data set, this is all you need. The basic rules are that no single field may be larger than 39 characters and the total number of characters allotted to any data set may not exceed 255.

There are six primary data types: *T*, *I*, *\$*, *F*, *D*, and *U*, for text, integer, dollar and two-place decimal, floating decimal, date, and user-defined. There are also

secondary field types—*B*, *BS*, *C*, *CS*, and *M*, representing borrowed, borrowed and stored, calculated, calculated and stored, and mandatory. Types can be combined, such as *TM* for mandatory text, or, as some products refer to it, a "must-fill character field."

It should be noted that *T-Base* is frugal with storage. Data is stored in comma-delimited format, one line per record. Fields with a null value—i.e., nothing is

**Here is a nifty, relational database packed into a chip the size of a postage stamp.**

entered for them—take up no space except for the comma to mark the field placement.

### RELATIONAL DATABASE

What really distinguishes *T-Base* is its ability to handle relationships between data sets. In relational database design, redundant data is kept to a minimum by "normalizing" data into logical components that tie together through a relational key.

To understand this fully requires study, but let me offer a simple example. In a typical mailing list there is a tendency to repeat data. If, for instance, you are tracking a number of people who

```
10, LNAME, FNAME, HONR, TITLE, COM
PANY, ADDR1, ADDR2, CITY, STATE, PO
STAL
Last Name: , 20, T
First Name: , 20, T
Honorific: , 5, T
Title: , 29, T
Company: , 29, T
Addr1: , 29, T
Addr2: , 29, T
City: , 25, T
State/Province: , 2, T
Postal/Zip: , 10, T
```

Listing 1. The definition file for a simple mailing list data set for *T-Base*, the *Ultimate ROM II*'s powerful relational database.

work in the same company, the company name, address lines, city, state, and postal codes get repeated for every person in that company.

Let's suppose that you're a salesperson who is tracking companies. Some of the companies are already customers and some are prospects. Your contact list will usually include the names of two or more contacts per company.

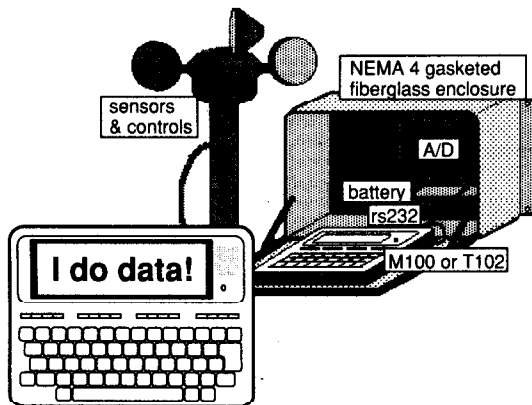
You could break this out into two *T-Base* data sets—one for companies and one for contacts within the companies. There are advantages to this. If the company moves or changes names, you need to change this in the database only once. If one of your contacts moves to a different company in your database, you have to change only the Company ID field.

Look at Listing 2 to see what the two data sets—one named *COMP\*S.DO* and one named *INDV\*S.DO*—might look like. Let's say you have a company record that looks like what's shown in Listing 3. Then when you fill in the form for contact, you get what is in Listing 4.

The data shown here in boldface (though it won't be in boldface on your computer screen) is actually read from the company data set, where it is stored,

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- Months of operation on battery & solar panel is possible in *powersaver* mode. The system wakes up intervals to take readings, then goes back to sleep. Continuous operation on AC power adapter & backup battery also supported.
- Probes and adapters available for:
  - temperature, humidity, windspeed & direction, light level, rainfall, surface moisture, pH, pressure, voltage current and more.
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9, COMPID, COMPANY, ADDR1, ADDR2, CITY, STATE, POSTAL, SWBRD, COMPF AX

Company ID:, 5, TM  
 Company Name:, 29, T  
 Addr1:, 29, T  
 Addr2:, 29, T  
 City:, 25, T  
 State/Province:, 2, T  
 Postal/Zip:, 10, T  
 Switchboard:, 14, T  
 Main FAX:, 14, T

11, COMPID, NAMEID, LNAME, FNAME, HONR, TITLE, COMPANY, PHONE, INDF AX, COMPFAX, SWBRD, LAST, NEXT

Company ID:, 5, TM  
 NameID:, 5, TM  
 Last Name:, 20, T  
 First Name:, 20, T  
 Honorific:, 5, T  
 Title:, 29, T  
 Company:, 29, TB, COMP, COMPID, COMPANY  
 Phone:, 14, T  
 Company Switchboard:, 14, TB, CO  
 MP, COMPID, SWBRD  
 Fax:, 14, T  
 Central Fax:, 14, TB, COMP, COMPI  
 D, FAX  
 Last Date Contacted:, 6, D  
 Next Date of Contact:, 6, D

Listing 2. Two data sets: The first (COMP\*S.DO) is a data set for a company, the second (INDV\*S.DO), a data set for an individual. The two are tied together—or are related—by the company ID.

and only *displays* in the individual's data set. It does this through the *T-Base* "borrow" data type that references another data set with three parameters: the name of the data set, the unique ID of the correct record, and the field within that record to "borrow." These parameters

**Functions such as  
 ABS, ASC, VAL,  
 RIGHT\$, & LEFT\$,  
 will warm the  
 hearts of BASIC  
 programmers.**

are stored in the individual's data set, saving space and centralizing the company's data to one data set.

You can link more than two data sets in this way. Three- or four-way joins are common. The *T-Base* manual offers some good business examples using customers, suppliers, products, and orders.

*T-Base* is also set up to do relation joins in its reports, which can be sent to display, to print, to a file, or out a modem. With its frugal data storage and its relational capabilities, you can squeeze in some useful databases on a Model T. There is also a rich set of functions, from mathematical to string functions. Notably, functions such as *ABS*, *ASC*, *VAL*, *RIGHT\$*, *LEFT\$*, *TIME\$*, and *DATE\$* will warm the hearts of *BASIC* programmers.

### DOWNSIDE

As much as I like *T-Base*, I must also point out its Achilles heel: it is slow. While more straightforward to me than working with the *Lucid Data* module of the *Super ROM* chip, the sluggishness of the product is a burden. If this product were written in machine language and had the snap of *Lucid*, I'd give it top marks. As it is, you'll need to develop patience to use it. The feature set, however, is excellent, and it may just keep you willing to use it regardless of its performance.

### IDEA!

The weakest module in the *Ultimate ROM II* set is the *Ideal* outliner. In fact, I'm not going to dwell long on it because it is unbearably slow and does not have the redeeming features of *T-Base*.

# MODEL T JOYRIDE

Company ID:ROM  
Company Name:Royal Ontario  
o Museum  
Addr1:100 Queen's Park  
Addr2:  
City:Toronto  
State/Province:ON  
Postal/Zip:M5S 2C6  
Switchboard:416-586-1111  
Main FAX:416-586-5863

Listing 3. A sample company record for one company. Listing 4 shows how some of the information in this record can be displayed in an individual's record using a relational database such as T-Base.

An outliner must have relatively good speed or it can't be used to brainstorm ideas. *Idea!* is not in the same league as *Thought*—the outliner in the Super ROM chip.

In addition to being slow, it lacks standard outlining features, such as the ability to promote and demote headings easily. It does have the ability to collapse and expand headings, but the procedure is awkward and unnatural.

*Idea!* has only one feature that has endeared itself to me. It allows me to add large amounts of text under any heading or subheading. But this did not make up for the product's lack of speed, its lack of standard features, and its poorly written manual.

## TS-RANDOM

Tucked into *Ultimate ROM II* is an extremely useful fragment for those who own the Traveling Software (Club 100) TS-DOS product. Instead of taking up RAM with a floppy-drive manager such as *FLOPPY.CO*, *UR2* keeps a loading program in ROM. It loads the TS-DOS driver from floppy when it is used rather than storing it in RAM. This works well, but has the downside that you have to copy the main portion of TS-DOS to each floppy you create before you can access it.

The built-in driver allows *UR2* to access files on floppy as easily as those in the Model T's RAM.

## AND THE WINNER IS . . .

Well, this wraps up our extended look at the two leading ROM packages for the Model T. In one corner we have *Ultimate ROM II*, weighing in at \$89 and offering word processing, relational database, outlining, easy diskette access, and an incredibly useful screen utility that gives a Model T up to 60 characters per line. In the other corner is the *Super ROM*, weighing in at \$199 and offering word processing, outlining, spreadsheet, and spreadsheet-based database.

And the winner is . . . *the customer*. Damned right. Both products cost far

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less than any single major DOS product. Both take your Model T computing to new heights.

The *Ultimate ROM II*, at \$89, offers the best all-around set of utilities, plus a sophisticated, if slow, relational database program. *ROM-View 80* may keep you happy with your Model T for much longer than you might have expected. Seeing more words on the screen helps greatly with writing.

*Super ROM*, at \$199, is the quality champ. Its tightly integrated, machine-

## And the winner is . . . the customer.

language modules work as fast as the Model T processor allows. You get an excellent outliner and access to the best Model T spreadsheet available. Unfortunately, you don't get more characters per line, nor do you get disk access.

## FAREWELL

This month's JOYRIDE column wraps up our look at those amazing

Company ID:ROM  
NameID:WILBG  
Last Name:Wilburn  
First Name:Gene  
Honorific:Mr.  
Title:Sr. Systems Analyst  
Company:Royal Ontario Museum  
Phone:416-586-5626  
Switchboard:416-586-1111  
Fax:  
Central FAX:416-586-5863  
Last Date Contacted:112591  
Next Date of Contact:021292

Listing 4. An individual contact's record. The bold-face data shows where information from one data set (here, from a company data set) can be displayed in another data set.

ROM products for the Model T. It also wraps up my stay as the JOYRIDE columnist. I'm off to a new set of challenges and commitments. Thanks to all of you who took the time to write to me or send me e-mail on CompuServe. Keep your batteries charged and your portable handy!

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





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

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

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

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

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

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

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

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

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

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

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

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

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

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

easier and faster to use."

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

LUCID® is, in our opinion and that of those who have examined it, a breakthrough. We sell it on a 30 day trial. If you are not completely satisfied, return it within 30 days for a full refund. Priced at \$99.95 on snap-in ROM. Please add \$5.00 for shipping and handling. Mastercard, Visa, American Express or C.O.D.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

We couldn't list all the features here. For example, you can select not just double space but triple or any other. You can use your TAB

key in a document. WRITE ROM allows you to indent. This means you can have paragraphs with a first line projecting to the left of the rest of the paragraph. WRITE ROM has a feature unique for any word processor on any computer. It's called FORM. FORM is an interactive mechanism that lets you create screen prompts so that you or someone else can answer them to fill out forms or questionnaires.

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

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

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

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

We brashly state that WRITE ROM is the best you can buy. But put that to the test. If you aren't as excited as we are, return it for a full refund. Priced at \$99.95 on snap-in ROM. Mastercard, Visa, American Express and COD. Please add \$5.00 shipping and handling charge.

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# WHO, WHAT, WHEN: The WP-2 Calendar

*Make your day and organize your life.*

*by Stan Wong*

**T**he WP-2 excels as word processor. I bought the WP-2 to help me with my word processing tasks and it's served me very well. If it can help me with other aspects of my life and work, then that's icing on the cake (anything that can increase my output of clichés is useful to me).

It didn't come as a surprise to me to discover that the WP-2 has a built-in *Calendar*, *Phone*, and *Telcom* functions. At first glance, these seem to be roughly analogous to the Model 100 *ADDRS*, *SCHDL*, and *TELCOM* functions. And they are, on the surface. But look deeper and you'll find that these "extra" functions are different and can be truly useful even in a "dedicated" word processor.

## IT'S ABOUT TIME

This month I'll talk about the WP-2 *Calendar* function, also known as *F2-0* to its fans. The *Calendar* function can help you organize your life. It lets you create, sort, update, and store one or more lists of events. It's not part of the WP-2 mainstream functions, but useful nonetheless.

The *Calendar* uses four basic functions, "WP-2" style: a) create a calendar, b) update a calendar, c) sort a calendar, and d) print a calendar.

Using the *Calendar* function is conceptually similar to MS-DOS's terminate-and-stay-resident (TSR) programs. For those of you unfamiliar with DOS, TSR's are programs that you can "pop up" in the middle of another program. One of the first and most popular TSR's is Borland's *Sidekick* program. You can pop up a notepad and record thoughts in the middle of your spreadsheet program. When you exit the TSR, you are returned to the point where you interrupted your

application.

How you access the *Calendar* determines what functions you'll be allowed to perform. You can access your calendar from the *Files* menu or from within a document.

## INSIDE JOB

You can invoke the *Calendar* function while you are editing a document. For instance, let's say that you are working on next month's sales forecast when suddenly the phone rings. It's your boss

---

**You'll find that  
these "extra"  
functions can be  
truly useful even  
in a "dedicated"  
word processor.**

---

asking you to attend a meeting in his place tomorrow at 10:00 A.M. A quick *F2-0* keypress gets you into your calendar. Good, no conflict. After assuring your boss that you'll take care of the matter, you enter the appointment, re-sort your list, and go back to editing the sales forecast. Not bad for a word processor!

The calendar function can be useful if you carry your WP-2 around with you. The calendar function is not as powerful or full-featured like a Casio B.O.S.S., Sharp Wizard, or HP 95LX, but it can help you manage your day.

To get started, you need to be editing one of your documents. Access the calendar function by pressing *F2-0*. You'll see this line in the upper left:

```
MO/DD/YY *HH:MI : COMMENT
```

In the lower right you'll see *mycal.do*. This is name of the file that your calendar will be stored in. Don't delete it!

The format takes a little bit of explaining. The *MO/DD/YY* is pretty straightforward. European and other users that use the *DD/MO/YY* format are out of luck. Remember to use two digits for *MO* and *DD*, such as *06/01/92* instead of *6/1/92*. The latter throws the sort function for a loop. You'll get a *Data Error* message if you don't follow the specified format exactly.

After inserting a space or tab, put in the time of day. The asterisk isn't part of the format. Instead, substitute an *a* for A.M. or a *p* for P.M.

A space followed by a colon, followed by a space or tab, separates a comment about the scheduled event. A correctly formatted example might look like:

```
12/09/91 p05:00 : Deadline for  
February P100 column
```

## UNSCHEDULED EVENTS

An unscheduled event is not the same as an unexpected event. Rather, it's something that you want to accomplish on a certain day, but not at any specific time. Since you have to specify a time for

each event, I use a time notation of `a00:00` to denote an unscheduled event. For example, I don't have to file my *P100* articles at any particular time during a day, but they are due on the specified day. The entry above would look like the following in my *Calendar*:

```
12/09/91 a00:00 : Deadline
for February P100 column
```

By using midnight for the time, unscheduled events get sorted to the top of each day's events. This is a personal preference. You could use `p11:59` to sort these events to the end of each day's list.

## FIRST THINGS FIRST

A calendar is best not only if it tells you what to do and when to do it, but in what order. If you are keeping track of appointments, then you want to sort your calendar by date and time.

The *Calendar* sort function works with calendars stored only in the file named *mycal.do*. But don't take this to mean that you can keep only one calendar. You might keep one calendar for business events and another for social and yet another for personal events. I haven't discussed keeping multiple calendars yet, but just keep in mind that it's possible.

To sort your calendar you have to be in the *Calendar* mode (`F2-0`, remember?). Pressing the `SORT` key (`F2-3`) sorts the entire list.

You can sort a part of your calendar by selecting the portion that you want to sort before pressing the `SORT` key. This implies that the entries that you want to sort are contiguous. I'm not sure what application this has in the context of a calendar, but if you have a bright idea please write to me.

## CALENDAR FROM FILES

I mentioned earlier that you can access your calendar from within a document or from the *Files* menu. You can do two things from the *Files* menu. The simplest is to put the cursor over *mycal.do* and press `ENTER`. You'll now be editing your calendar as if it were an ordinary file. You can edit the contents, scroll through it, and do anything you want including add entries that are illegally formatted. Since you are not in the *Calendar* function, the *Calendar* software isn't checking to see if you are making any boo-boos. This can be a handy way of looking at your calendar if you are at the *Files* menu. But I don't recommend that you edit any data unless you are very careful. If you do this and your calendar won't sort later, you probably made a

syntax error when making changes.

## VIEWING YOUR CALENDAR

You can also check your *Calendar* at the *Files* menu by using the `VIEW` function. Highlight the *mycal.do* entry and press `F1-V` instead of `ENTER`. You will see the first seven lines of your calendar. A `—More—` indicator in reverse video, at the bottom, tells you that there's more to look at. Press `ENTER` to see the next seven lines. Unfortunately, this is a one-way viewer. You can scroll forward through your calendar but not backwards. At the end of the list you'll be deposited back at the *Files* menu. Or press `ESCAPE` to quit before you've reached the end of your calendar.

I find it more convenient, at the *Files* menu, to press `ENTER` rather than `F1-V`. This puts me in the normal text editing mode. I can use the normal cursor control functions to scroll forward as well as backward through my appointments.

---

**A calendar is best  
not only if it tells  
you what to do and  
when to do it, but  
in what order.**

---

## POTPOURRI

You can print your calendar as you would any other file. If you want a special header, then you can set one up in a master file, paste a copy of your calendar in it, and print it.

Keeping multiple calendars is straightforward but a bit awkward. You may want to separate your work calendar from your personal calendar. If you are active in civic or professional events you may want to keep a third calendar as well.

The *Calendar* function is coded to work on the file *mycal.do*. You can copy the contents of *mycal.do* to another file and vice versa. The file *mycal.do* essentially becomes a holding spot for the current calendar.

## TIPS

Once per day perform maintenance on your calendar by deleting entries that have already happened. This way current events are always at the top of your calendar. If you're like me (I know that may not be desirable, but I'm into clichés, remember?), I have to write a fortnightly status report to my boss. Rather than `CUT`ting entries from the calendar, use the `PASTE` function to put the entries in another file. You can use this file as a reminder of what transpired during the last two weeks.

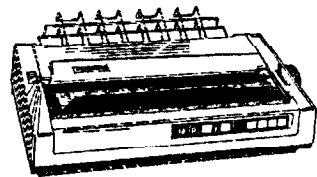
I can't take my WP-2 everywhere I go at work, so I carry one of those fat schedule/diary planners (Franklin Day Planner if you must know). If you're in the same boat as I am, then try these suggestions: Print your calendar in the morning, transfer today's schedule to your planner, and mark up the WP-2 calendar printout during the day as your future schedule changes. At the end of the day, update the WP-2 *Calendar* and print a new schedule for tomorrow.

If you don't use a planning/scheduling system, what I used to do was keep a computerized schedule. In the morning I'd print it out on one sheet of paper and tuck it into my shirt pocket. During the day I'd update my schedule as new events and changes occurred. I'd also use the sheet to take notes. The following morning I would update my *Calendar*, print a fresh copy, and file the previous day's calendar/notes for reference.

## WP-2 TIPS WANTED

For the past year I have been dispensing basic WP-2 information. If you've got some WP-2 tips that you'd like to share with your fellow readers, send them to me. I'll publish those tips that I haven't seen before and give credit to the first person who makes the suggestion.

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



# The Portable 100 Classifieds

## SOFTWARE

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

## HARDWARE

**Model 100 32K with Super Rom** \$275.00 firm. Call (308)527-3506.

**Model 100 32K.** Multiplan ROM. DVI. Modem, Cable, Recorder, Software, book, \$450.00; C. Itoh printer \$150.00. (812)853-3297.

**Tandy 102 32K,** Portable Disk Drive & portable Brother printer \$350.00; Tandy 1100FD 640K and modem \$450.00. (213)828-1997.

**TRS-80 Model 100 32K,** Super ROM, case, legs, adapter, seven software packages,

books. Needs new LCD screen. \$199.00. Peirce, 2948 Blairstone Ct., Tallahassee FL 32301.

**EMM, integrated ExtRAM/RAM/PDD-1&2** file manager. Runs in ExtRAM, utilizing unoccupied space for file storage. Features aggregate file selection and file compression. Send SASE for information or \$15.00 for disk. TPSIG, P.O. Box 684473, Austin TX 78768-4473.

**Record voltage or other analog parameters** with your 100/102/200. DATAMITE A/D converter connects to cassette jack. software provides voltage readout and/or emulates scrolling chart recorder on your Tandy screen. \$66 + \$4 S&H: Jones Service & Design, 1842 S. Nugent Rd., Lummi Is., WA 98262. (206)758-7258.

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

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

## FOR SALE

**TRS-80 Model 100, 32K, Scripsit 100,** \$200. Model 102, 24K, TView 80, \$200. Diskplus, \$75. (617) 871-1778. 3/92

**TRS-80 Model IV computer.** One 5Mega-byte Hard Disk Drive. One Radio Shack Printer -- Letter quality. Call (215) 279-8060. Best Offer.

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

**WP-2 ROM simulator card!** Plugs into the expansion card slot of the WP-2. Holds up to four 256Kbit EPROM's or two 1Mbit EPROM's. \$89.95 each. Midwest DataCard Marketing (513) 433-2511 12/90

**WP-2 with 128K and WP-duet—\$400.** Call Tom (707) 446-6435 3/92

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

## WANTED

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

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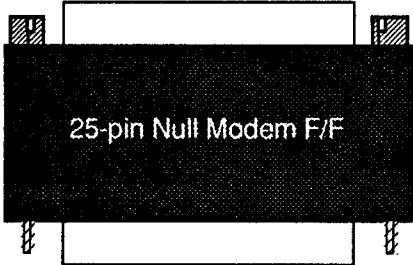
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## ADVERTISER'S INDEX

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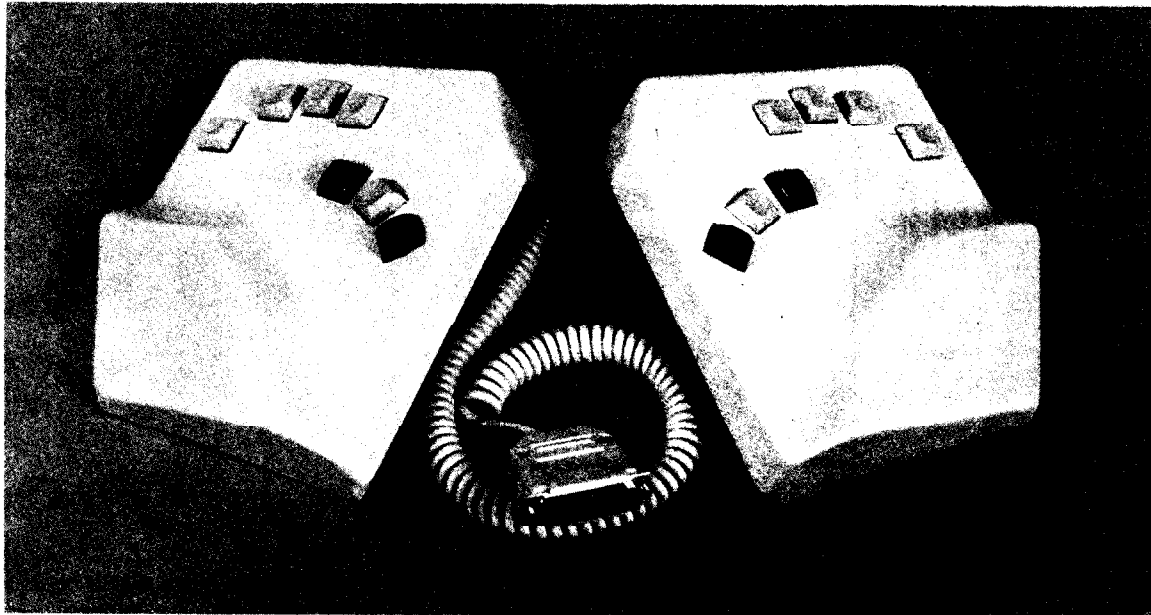
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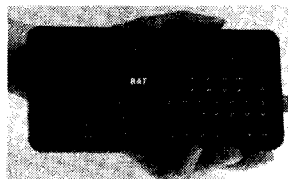
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| 3  | 28 | 53 | 78  | 103 | 128 | 153 | 178 |
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| 6  | 31 | 56 | 81  | 106 | 131 | 156 | 181 |
| 7  | 32 | 57 | 82  | 107 | 132 | 157 | 182 |
| 8  | 33 | 58 | 83  | 108 | 133 | 158 | 183 |
| 9  | 34 | 59 | 84  | 109 | 134 | 159 | 184 |
| 10 | 35 | 60 | 85  | 110 | 135 | 160 | 185 |
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| 20 | 45 | 70 | 95  | 120 | 145 | 170 | 195 |
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**Sub 1**

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*Note: The italicized entries in each month below are Tandy 100/102 related articles.*

### 1985

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

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

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

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

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

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

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

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

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

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

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

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**January:** Reviews of Gridcase 2, Access, Word-

Finder, and Prospecting, CP/M and MS-DOS, Security Program, Can Universities Cope with Picos? News from Comdex, *Jazz up your LCD*. **February:** Reviews of ZP-150, and LeScript Word Processing; *Stevie Wonder Inspires Stardom in M100*, Can Universities Meet Expectations of Computer-literate Students? *Cold-Start recovery, Personalized Form Letters*.

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

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

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

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

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

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

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

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

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

**February:** *Poor Man's Idea Processor*, Macin-

tosh-Pico Connection, *M100 Cursor key alteration*, Handhelds: HP-18C, Langenscheidt 8000, TI-74, Reviews of Sord IS11-C, *Lets Play Monopolly, \$100 letter quality printer*.

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

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

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

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

**February:** TennisStat, 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, Homeward Plus, VP-Expert.