

# 80 micro

the #1 magazine for Tandy users

SEPTEMBER 1986  
USA \$4.00  
CANADA \$4.50  
A CWC/I PUBLICATION

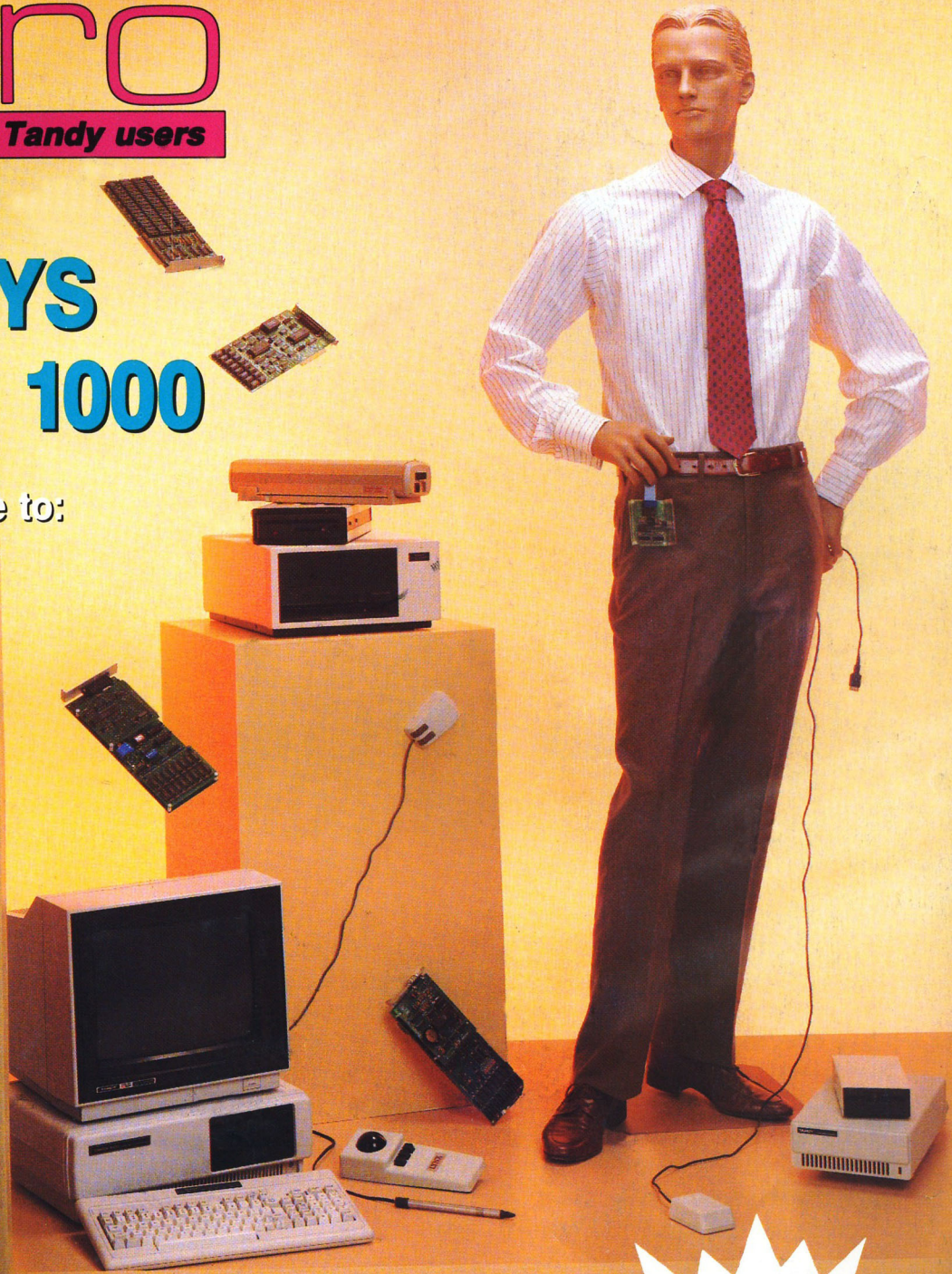
|                               |
|-------------------------------|
| <b>ALSO INSIDE:</b>           |
| <b>The Art of Programming</b> |
| <b>Dave's MS-DOS Column</b>   |
| <b>Public Works</b>           |
| <b>Feedback Loop</b>          |

## BEST BUYS FOR THE 1000

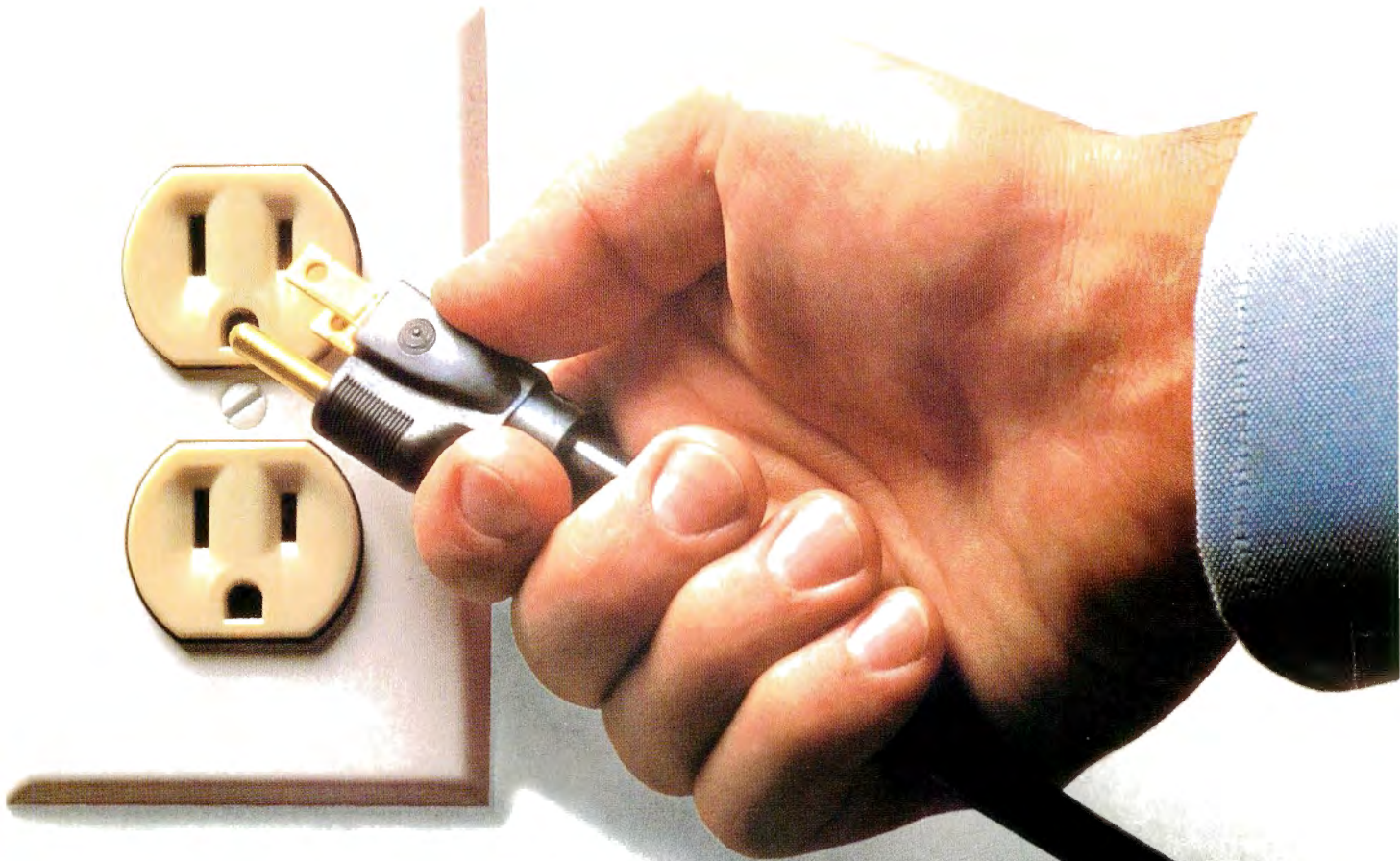
Your Complete Guide to:  
 Multifunction Boards  
 Memory Boards  
 Internal Modems  
 Hard Drives  
 Speed-up Boards  
 8087 Kits  
 And Much More!

**How to Convert  
 Your Model 100  
 Into a Modem!**

**Scriptit Pro:  
 Tandy Finally  
 Does It Right**



**The  
 Apple Emulator:  
 A First Look  
 (p. 44)**



# This is all it takes to get IBM, Apple, Tandy, Macintosh and Compaq talking to each other.

And it's simple and inexpensive.

Now a powerful **GridNet™** Local Computer Communications Network is as close as your nearest electrical outlet.

Thanks to GridComm's Communicators, virtually any office can create its own high speed, error-free **GridNet™**... instantly! There's no need to purchase special system software. And there's none of the expense

and inconvenience of installing additional wiring. Because a **GridNet™** utilizes your existing electrical grid as a highly-effective data transmission medium.

And a **GridNet™** will support IBM PC, XT, AT, and all IBM compatibles, Apple and Macintosh, Hewlett-Packard, Tandy, AT&T, Epson, NEC...all the most popular micros and peripherals, in the

same network. Freely sharing data, with complete connectivity and effective compatibility.

The cost? As much as 60% below that of specially-wired systems.

Find out just how easy it is to increase your office's productivity. See your local dealer, or contact "The Great Communicator" for more information.



**THE GREAT COMMUNICATOR**

Circle 271 on Reader Service card.

P.O. Box 2779, Danbury, Connecticut 06813-2779. For information call 203-790-9077

Trademarks: IBM, PC, XT, AT/International Business Machines Corp — Apple, Macintosh/Apple Computer Inc — Tandy/Tandy Corp — Compaq/Compaq Computer Corp — Hewlett-Packard/Hewlett-Packard Co. — Epson/Epson America Inc — AT&T/American Telephone and Telegraph Co. — NEC/NEC Home Electronics (U.S.A.) Inc.

# Did you know?

## Only one spelling checker:

- works with both Scripsit and Superscriptsit.
- integrates with all other popular word processing programs as well.
- requires *no special document placement!* Even runs on a single drive system.
- displays its dictionary so that you can find the correct spelling of words.
- offers integrated Hyphenation Option and Grammar & Style checker.

# Electric Webster

## SPELLING CHECKER :: AUTO-HYPHENATION :: GRAMMAR CHECKER

**Displays Correct Spellings:** If you don't know the correct spelling of a word, EW will look it up for you, and display the dictionary.

**Verifies Corrections:** If you think you know the correct spelling of a word, EW will check it for you before making the corrections.

**Hyphenates Automatically:** (Optional). Inserts discretionary hyphens throughout text.

**Grammar & Style Checker:** (Optional). Identifies 22 types of common errors. Makes suggested corrections with the stroke of a key. Runs within EW.

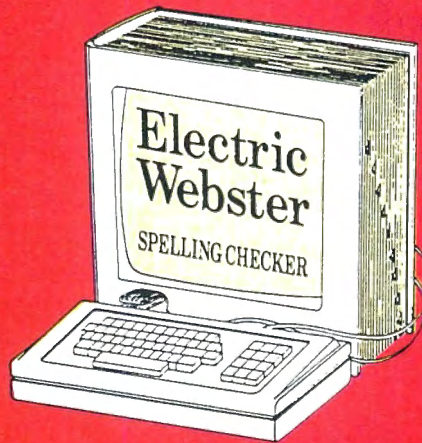
**50,000 Word Dictionary:** Uses only 2½ bytes per word; add as many words as you wish.

**Fast Correcting:** In as little as 30 seconds, Electric Webster can return you to your Word Processing program, with your text fully corrected and on your screen.

**Integrates:** with WordStar, Deskmate, Spellbinder, Volkswriter, Open Access, Allwrite, Newscript, Lazy Writer, Superscriptsit, Scripsit, Electric Pencil, Copy Art, Powerscript, Zorlof, and LeScript (specify). Begins proofing at the stroke of a key; returns you to word processing automatically.

**When ordering, stipulate word processing program and operating system.**

**"The Cadillac"  
of spelling checkers**  
— *80 Microcomputing*, 9/82



### ACCLAIMED:

"Electric Webster is the best. Just read any review in any magazine and I don't believe that you will find even one disagreement to that statement." *CINTUG, Cincinnati's Users Group Mag.* 4/83

"The most helpful program I've found is Electric Webster. After looking at nine proofreading programs, I've settled on Webster..." *Creative Computing* 11/83

This dictionary is not published by the original publishers of Webster's Dictionary or their successors.

Performance "Excellent"; Documentation "Good"; Ease of Use "Excellent"; Error Handling "Excellent". *Info World*, 8/82

"Electric Webster, a fantastic spelling and grammar checker" *80 Micro* 4/85

## Now see for yourself!

### Try Before You Buy:

**F**or the second straight year, 80 Micro readers have voted Electric Webster the #1 Spelling checker. Find out for yourself how accurate, fast and easy proof-reading can be. For only the \$5 cost of postage, materials and handling, we will send you a special Electric Webster demonstration disk that works just like Webster, but proofs only half the alphabet. With it, you'll get a coupon worth \$5 towards the purchase of Electric Webster.

### LOW PRICES:

|                               |          |
|-------------------------------|----------|
| TRS-80, Model I/III or IV     | \$ 89.95 |
| w/Correcting Feature          | \$149.95 |
| Hyphenation                   | \$ 49.95 |
| Grammar & Style Checker       | \$ 49.95 |
| CP/M, PC/DOS, Model 1000/2000 |          |
| Electric Webster,             |          |
| w/Correcting Feature,         | \$169.95 |
| Hyphenation, and Grammar      |          |

Circle 45 on Reader Service card.

**POP QUIZ**



# Cornucopia Software

POST OFFICE BOX 6111, ALBANY, CALIFORNIA 94706, PHONE (415) 524-8098

# DiskCount Data

WHERE  
QUALITY PROGRAMS  
MEET COMPETITIVE PRICES

2701-C W. 15th • SUITE 612 • PLANO, TX 75075 • (214) 680-8268

**ELECTRIC WEBSTER**  
by Cornucopia Software **129.95**

WITH CORRECTING FEATURE

**ELECTRIC WEBSTER**  
WITH CORRECTING FEATURE  
LIST 149.95 SALE 129.95

- HYPHENATION OPTION . . . . . 38.95
- GRAMMAR & STYLE . . . . . 38.95
- TRS-80 I/III/4 SPECIFY WORD  
PROCESSOR WHEN ORDERING

\*Note: hyphenation & grammar options are not available for all word processors. Ask when ordering.

**WORD PROCESSORS & PRINTER DRIVERS**

- Lazy Writer I/III/4 . . . . . 119.95
- Lazy Font I/III/4 . . . . . 44.95
- M-Script I/III/4 . . . . . 53.50
- LeScript I/III/4/Max . . . . . 109.95
- LeScript MSDOS-1000-1200 . . . . . 179.95
- PowerDriver-E Epson I/III/4 . . . . . 29.95
- PowerDriver-P Prowriter I/III/4 . . . . . 29.95
- PowerDriver-S Starwriter I/III/4 . . . . . 29.95
- PowerDriver-O Okidata 92 I/III/4 . . . . . 29.95
- PowerDriver-FX (FX/RX) I/III/4 . . . . . 29.95
- Epson Driver Compiler . . . . . 29.95
- PowerScript for Scriptit I/III/4 . . . . . 34.95

**GENERAL LEDGER**  
by FBN Systems **NOW 149.95**

The Finest We've Found

SAVE 50%

Multiple Cash Accounts. . . Departmentalize any account. . . You select which accounts print on income statement & balance sheet. . . Real time transaction posting. . . no more batch processing. . . total audit trail. We have what we believe to be the finest general ledger for the Model III on the market. Call for more details or order now.

**A Serious Business Program.  
LIST \$300.00**

**OPERATING SYSTEMS**

- CP/M 2.2 Montezuma Mod 4 . . . . . 169.95
- R-Shack HD Driver for CP/M 2.2 . . . . . 30.00
- Monte's Window . . . . . 49.00
- Monte's Toolkit . . . . . 49.00
- Monte's Basic (Bascon) . . . . . 49.00
- Dosplus 4A with M-ZAL . . . . . 129.95
- Dosplus 3.5 I/III . . . . . SALE 79.95
- Multidos 1.71 I/III . . . . . 79.99
- Multidos 80/64 . . . . . 89.95

**MOD 4 BY JACK**

A complete re-write of the Mod 4 manual in English! . . Only \$9.95

**POWERMAIL PLUS**  
By PowerSoft

**ONLY 89.95**

Separates any category for you in any manner you wish. This new version can span drives and may use multiple floppies. The program will sort on any eight levels if you wish. Separates your flags and puts them into another file. Print options: Labels & Listing. One choice is the simple "telephone book" type listing. Two of the other modes give you not only the listing of names, but also either FLAG numbers, or the actual FLAG descriptions. The final print mode is what we call THE SALESMAN'S NOTE-BOOK™. It prints out the whole list or whatever parts you specify with all info including full flag description in each record. Then the word "Notes" is printed with several lines of blank space for making those notes in the field. MOD I/III or 4/P/D

**UTILITIES**

- J&M Memory Minder I . . . . . 84.95
- J&M Memory Minder III/4 . . . . . 74.95
- The Toolbox for LDOS . . . . . 44.95
- ALCOR C Complete System . . . . . 64.95
- ALCOR Multi-Basic Compiler . . . . . 64.95
- ALCOR Pascal . . . . . 64.95
- AOS Superkeys Key Macros Mod III . . . . . 35.00
- The Toolbelt Mod 4 . . . . . 44.95
- AOS Utils. 1 Varkeep/Scrnpr . . . . . 49.95
- Pascal-80 Mod I/III . . . . . 59.95
- The Creator Mod I/III/MSDOS . . . . . 44.95
- AS Public Domain Disks (each) . . . . . 9.95
- Zues Editor/Assembler I/III/4 . . . . . 74.95
- System Diagnostic I/III/4 . . . . . 89.99
- Trashman . . . . . 32.50
- Faster . . . . . 22.95
- RPM . . . . . 21.50
- DSMBLR III I/III . . . . . 29.95
- Accel 3/4 Basic Compiler I/III . . . . . 44.95
- Monitor 5 I/III/4 . . . . . 22.95
- Hyperzap Disk Utility I/III/4 . . . . . 49.95
- Z-Basic Compiler 3.0 . . . . . 79.95
- T/Maker Mod 4/4P/4D . . . . . 275.00
- DOSTAMER . . . . . 49.95
- PRONTO . . . . . 59.95

**SUPER UTILITY PLUS**  
By POWERSOFT **SALE**

VOTED AS THE OUTSTANDING UTILITY BY 80-MICRO READERS

**PROTECTED MEDIA**

**BUY SUPERUTILITY PLUS 3.2 FOR MOD I/III**

MOD 4 VERSION FOR MOD 4/4P/4D AT \$74.99

AND RECEIVE THE NEW BOOK USING SUPERUTILITY PLUS FREE

A \$100.00 VALUE FOR ONLY \$74.99

SUPERUTILITY/PC NOW \$84.95

**SCHOOL UTILITY AND EDUCATIONAL**

- Power Reading . . . . . 64.50
- Test Question Data Bank . . . . . 49.95
- Test Generator/Drill . . . . . 34.95
- Football Scouting . . . . . 49.95
- Basketball Statistics . . . . . 39.95
- Baseball Statistics . . . . . 39.95
- Computer SAT III-1000-1200 . . . . . 79.95
- Student Schedule Data Base . . . . . 49.95
- Teacher Evaluation . . . . . 39.95

**THE HOME ACCOUNTANT**  
By Continental Software **ONLY 62.50**

An Outstanding Financial Planner

• Maintains up to 100 budget categories • Keeps track of up to 5 checkbooks • Prints checks, if desired • Prints a personal balance statement, income and expense summary • Prints net worth statement • Provides fast bank reconciliation • Allows the extensions on multiple diskettes • One program handles cash, checkbooks • Credit cards and other liabilities and expenses • Unlimited annual, fiscal or calendar year • Transactions may be "split" among different budget categories • Flags transactions for tax purposes • Maintains transaction history • Provides Hi-Res graphics for any category by bar graph.

The program itself does adjust about everything you'd ask of a "personal finance package" — Popular Computing, November, 1982

MOD III

**GRAPHICS AND GAMES**

- Powerdraw I/III . . . . . 34.95
- Graphit (Line Graphing) . . . . . 34.95
- AOS Utils. Screenpacker Plus . . . . . 49.95
- PowerDot II I/III Spec. Printer . . . . . 54.95
- Meltdown (Nuclear Powerplant) . . . . . 19.95
- Gamepak-3 (Funface, Match, etc.) . . . . . 29.95

**SUPERDOS**

Over 15 enhancements to TRSDOS 1.3 . . . . . 29.95

**FAST/CMD**

Run TRSDOS 1.3 at the high speed in Mod 4/4P . . . . . 29.95

**•FREE• FREE SPECIALS •FREE•**

Order over \$100.00 and select one of the following ABSOLUTELY FREE. Order over \$200.00 and you may select any two items: **SOFTWARE:** Varkeep/Screenpacker Plus • Master Directory Mod III • Superkeys Mod III • Meltdown I/III • **BOOKS:** TRS-80 For Kids From 8 to 80 Vol. 1 or II • Electronically Speaking • Computer Communication Techniques • The Rest of 80 • Using the Z-80 in the TRS-80 • TRS-80 Data Files • Inside Your Computer • **GREEN SCREEN** • Mod I, III/4/4D or P

**ICS PROFESSIONAL**  
by Freeman Software **ONLY 89.95**

**INVENTORY CONTROL SALES REGISTER INVOICING**

This complete retail inventory, invoicing and sales register system will maintain over 2,500 items on MOD III floppies with built-in accounting for sales tax, sales type and 9 different sales people. Print sales registers, invoices and many different inventory reports on 80 or 132 col. printer. Tracks backorders and will also re-order on predetermined quantities. Also maintains cost of entire inventory. A GREAT VALUE! MOD I/III or PC/1000

**TRSDOS-MSDOS-CPM HUGE SALE ON CONVERSION UTILITIES**

- CONVERT BASIC TO PC . . . . . 29.95
  - SUPERCROSS/XT . . . . . 90.00
  - SUPERCROSS/XT W/CONVBASIC . . . . . 99.95
  - HYPERCROSS/XT 2.0 . . . . . 99.95
- THESE UTILITIES ARE A MUST FOR CONVERTING TRSDOS TYPE PROGRAMS TO YOUR MSDOS OR CPM COMPUTER. ALL MENU DRIVEN, THEY DO THE COMPLETE CONVERSION ON YOUR TRS-80. MOD 1 NEEDS DOUBLE DENSITY. Specify MOD IDD, MOD III, MOD 4

**ENCYCLOPEDIA FOR THE TRS-80\***

WE FOUND ANOTHER CACHE! A GREAT COLLECTOR'S ITEM BUY THE FULL 10 VOLUME SET NOW WHILE IT IS STILL

only 39.95 AVAILABLE only \$39.95

AN APOLOGY TO OUR CUSTOMERS. . . . We sold thousands of books on our Christmas Sale Flyer and sold out of both versions of the ENCYCLOPEDIAS. We have since discovered another cache which we bought to pass on to you at our lowest price ever. Each volume contains from 15 to 20 articles accompanied by program listings. The books are each approx. 20 pages covering such topics as UTILITY, TUTORIAL, BUSINESS, WORD PROCESSING, HARDWARE, GRAPHICS, GAMES and MORE. This is the FULL 10 VOLUME SOFTCOVER Edition originally sold for \$109.50. Volumes measure 6 x 9 inches and were authored for the Model I/III. Many of the listing will work on the Models 4. SALE ONLY \$39.95. . . . Please add an additional \$2.00 to our normal shipping.

**PRINTER RIBBONS**

Brand New—No Reloads

- | PRINTER                                     | PRICE EA. |
|---|-----------|
| ANADIX 9500 SERIES/9620/9625 . . . . .      | 8.00      |
| C. ITOH 8510 PROWRITER . . . . .            | 6.00      |
| C. ITOH A10/F10/DWP 210 (FILM) . . . . .    | 4.00      |
| DWP 2100/TOSHIBA 1350 . . . . .             | 7.00      |
| DMW I/DWP-410 (MULTI STRIKE FILM) . . . . . | 5.00      |
| EPSON MX 80/FX/RX . . . . .                 | 5.00      |
| EPSON MX-100 . . . . .                      | 8.00      |
| LP III/V . . . . .                          | 6.00      |
| OKIDATA 80/82A/83A/92/93 . . . . .          | 3.00      |
| OKIDATA 84 . . . . .                        | 4.00      |

**NEW BOOK**

The Programmers Handbook of Computer Printer Commands

This outstanding new issue offers you all control codes of the most popular 170 printers. Complete tables for Daisy Wheel & dot matrix printers indexed alphabetically by mfg. It also includes names & addresses of all listed mfgs. Codes are presented in written, hex and decimal equivalent. A great information source.

270 PP, Spiral Bound. . . . . **37.95**

**INFOSCAN**  
by The Small Systems Center

**NOW 44.95**

- Retail . . . . . 49.95
- Special . . . . . 44.95

Infoscan is an information utility that is used to organize, store and retrieve any type of useful information in any format. It combines the features of a word processor, data base manager and information retrieval and display utility. You compose information records on the screen using the word processing feature in any format you like. Each record is described by 1-17 character keyphrases that you specify. Once created, the information file's key phrases can be scanned as a list on the screen using an impressive key scan bracket. You scroll the keyphrases thru the brackets with the arrow keys on your keyboard. When the desired keyphrase is found, you press a single key and the corresponding information record is retrieved from disk and displayed on the screen. The record displays in exactly the same format as you used to create it. You can even design your own forms to "fill in."

MOD I/III MINIMUM 48K 1 Drive

**DS/IDD DISKETTES**

10 EACH, PACKAGED IN A PLASTIC LIBRARY BOX **9.95**

**ZBASIC 3.0**  
by Zedcor **79.95**

The Incredibly Fast BASIC Compiler

It's ZBASIC. Written for programmers by programmers. (If you know BASIC—you know ZBASIC!) Now you can write a program exactly the same way on an Apple, an IBM, a Tandy, or any other major micro and port the source code. You only write the program once. . . . and it runs on all the major micros. The commands stay the same—regardless of the computer\* (even graphic commands and disk I/O).

ZBASIC. Starting now, it's the only language you'll ever have to know.

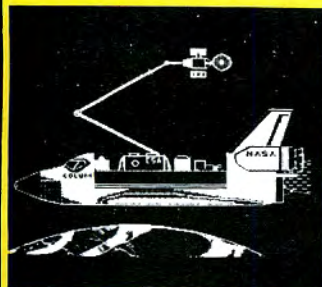
\*SPECIFY VERSION WHEN ORDERING  
•TRS-80 MOD. I, III •IBM and Compatible •CP/M-80 2.2w/7  
•TRS-80 MOD 4, 6.2 DOS 2.1 or greater (on Kaypro S500)

**BOOKS, WALL CHARTS & MISC**

- Using SuperUtility (new issue) . . . . . 17.95
- Super Utility Tech Manual 3.x . . . . . 13.95
- TRS-80/Z-80 Assembly Library . . . . . 31.95
- TRSDOS 6/LDOS Programmers Guide . . . . . 19.95
- Green Screens I/III/III/4/4P . . . . . 16.95
- Diskettes DSDD 10 in Plastic Bx . . . . . 9.95
- Colored Sentinel Disks . . . . . 17.00
- Profile 3+ Commands Wall Chart\* . . . . . 4.00
- Viscalc Commands Wall Chart\* . . . . . 4.00
- Superscript Wall Chart\* . . . . . 4.00
- Model III Basic Wall Chart\* . . . . . 4.00
- Model 4 Basic Wall Chart\* . . . . . 4.00
- Mod 4 by Jack (user guide) . . . . . 9.95

\*Charts not shipped as separate order

# High-Resolution Graphics



## HI RESOLUTION GRAPHICS

**THE GRAPHICS SOLUTION** by Micro Labs \$189.95  
Run the best Hi-Res board on your Mod III or 4/4P. Far superior to Radio Shack's board, this gem will open up a new world of graphics applications. Graphics basic is included along with 39 other Hi-Res demos & applications and a detailed user manual. All major operating systems are supported and the Hi-Res screen can be printed on 20 popular printers. Installation is simple with a clip-on internal board. Hi-Res, text & Low-Res graphics can all be displayed simultaneously. This board is the finest Hi-Res modification on the market and additional Hi-Res software is available. Call for further details. Specify Mod III, Mod 4, 4P or 4D when ordering. **Was \$299.95 REDUCED TO \$189.95 SALE \$189.95**

## HI-RES SOFTWARE

|                            |                       |
|----------------------------|-----------------------|
| 3D PLOT                    | 39.95                 |
| MATHPLOT                   | 39.95                 |
| BASIC                      | 39.95                 |
| SLIDESHOW                  | 19.95                 |
| PCHAR                      | 14.95                 |
| DRAW                       | 39.95                 |
| BIZGRAPH                   | was 98.00 now 75.00   |
| ADVANCED LET'S WRITE MUSIC | 49.95                 |
| XTCAD                      | was 449.95 now 345.00 |
| SURFACE PLOT               | 39.95                 |
| G BASIC 3.0 FOR R/S BOARD  | 49.95                 |
| TOURNAMENT CHESS           | 49.95                 |
| TOURNAMENT REVERSI         | now 29.95             |
| 3-D TIC TAC TOE            | now 19.95             |
| LIFE & SPIROGRAPH          | 24.00                 |
| FRACTALS                   | 19.95                 |

## Back By Popular Demand The Programmer's Guide To LDOS/TRSDOS 6

Five star rated by 80 MICRO, The Programmers Guide is a must have book to understand the internal workings of the DOS. 200 Pages—8½ x 11, by Roy Soltoff one of the authors of LDOS/TRSDOS 6. **Retail 24.95 Sale 19.95**

## DOSTAMER

By the Babbage Patch  
Dostamer Mod 4/4P/4D 49.95  
Dostamer for 1000, PC/MS-DOS 49.95

Just Reduced NOW **\$49.95**

You have heard of DOS manager type programs in the MS-DOS world. Now the Mod 4 has one too. Rated 4½ stars by 80 MICRO, it has 10 full user menu screens to customize your DOS. Help menus are included and now, for a first, you can comment all your directory entries. Tag/Untag all files for mass copy/kill etc. Over 200 user defined keys. We highly recommend this outstanding software package.

## Game Pak 3

By Micro Mining

**29.95**

3 Excellent games for the price of what one game would normally cost.

- #1 FUNNY FACE. . . . A graphic program that lets you construct over 1,000,000 faces. Also play the police line-up.
- #2 MATCH. . . . A graphics matching game like the popular TV game "Concentration."
- #3 REPEAT AFTER ME. . . . Emulate the popular game "Simon."

# OUR GREAT BOOKSALE CONTINUES

FOR BOOK DESCRIPTIONS, SEE OUR 80 MICRO AD (JUNE '86)

| TITLE  | RETAIL  | SALE    |
|--|---------|---------|
| TRS-80 FOR KIDS FROM 8 TO 80 I                               | \$10.95 | \$ 7.95 |
| TRS-80 FOR KIDS FROM 8 TO 80 VOL. II                         | \$10.95 | \$ 7.95 |
| HOW TO MAINTAIN & SERVICE YOUR SMALL COMPUTER                | \$17.95 | \$11.95 |
| USING THE Z-80 IN THE TRS-80                                 | \$13.95 | \$ 3.95 |
| COMPUTER COMMUNICATIONS TECHNIQUES                           | \$15.95 | \$10.95 |
| ELECTRONICALLY SPEAKING                                      | \$14.95 | \$ 9.95 |
| PRACTICE PROBLEMS IN NUMBER SYSTEMS, LOGIC & BOOLEAN ALGEBRA | \$11.95 | \$ 7.95 |
| INSIDE YOUR COMPUTER   | \$12.97 | \$ 8.95 |
| TRS-80 DATA FILES  | \$12.97 | \$ 3.00 |
| THE WORLD CONNECTION   | \$ 9.95 | \$ 6.95 |
| IBM PC FOR KIDS FROM 8 TO 80                                 | \$15.95 | \$10.95 |
| ANNOTATED BASIC VOL. I                                       | \$12.97 | \$ 3.00 |
| ANNOTATED BASIC VOL. II                                      | \$12.97 | \$ 3.00 |
| THE REST OF 80   | \$ 9.97 | \$ 5.95 |

## BOOK QUANTITY SPECIALS

This special only applies to the titles featured above. Please add an additional \$2.00 to our normal shipping.

**BUY ANY FIVE BOOKS FOR \$30.00**

**BUY ANY TEN BOOKS FOR \$50.00**

Quantities limited and subject to prior sale

# TWO NEW RELEASES

## POWER READING

4½ star rated by 80 MICRO  
More than Speed Reading by LSR Associates ★★★★★

A great program for teachers, students and anyone else who would like to greatly increase their reading speed and comprehension. This program automatically adjusts to individual abilities and it's better than taking outside speed reading courses. Power reading monitors your reading as you progress and will adjust speed. It prints reports to the screen or printer. Successfully tested on grades 7-Adult. This program is shipped with a general reading courseware diskette packed full of stories. An additional "Investment" courseware diskette is available. Mod III version runs in the 4/4P/4D.

Power Reading specify Mod III or MS-DOS . . . . . 64.50  
Additional courseware diskette . . . . . 16.50

## MASK MAKER

A Screen design and development system by Strachen Holdings LTD.

Now design your own graphic or data input screens in the native Mod 4/4P/4D mode. If you are writing programs in either BASIC or Assembler, let Mask Maker save you hours of development time. You can design any custom screen to your specifications and layout for merging into your programs. Mask Maker will automatically write to code and generate several different output formats in Assembler or BASIC to enhance your program design. Mask Maker runs under TRSDOS 6.2. It is a valuable programmers tool priced very reasonably. Mask Maker received a 4 star review in 80 MICRO, June 1986. The manual has been totally rewritten since the review.

Mask Maker Mod 4 . . . . . **ONLY 39.95**

## THE TOOLBELT MOD 4

by Powersoft

Powersoft does it again with a collection of 16 of the most popular LDOS TOOLBOX utilities republished for TRSDOS 6 running on the Model 4. Now enhance your MOD 4 TRSDOS with this powerful set of utilities. Complete with detailed manual on how to use each utility program to do the many things the TOOLBOX for LDOS was famous for.

**44.95**

MODEL 4

## APPLICATIONS

|                                  |        |
|----------------------------------|--------|
| Macro Typing Tutor I/III/4       | 39.95  |
| ST-80 III                        | 69.95  |
| Masterdirectory Mod III          | 29.95  |
| Superdirectory Mod I/III         | 39.95  |
| Datagraph I/III/4Max             | 74.95  |
| Datagraph w/Pie Chart Option     | 109.95 |
| The Basic Checkbook I/III        | 64.95  |
| Mterm I/III/4                    | 59.50  |
| Loan Amortization III            | 29.95  |
| PowerMail Plus I/III/4           | 89.95  |
| Text Merge for PowerMail         | 49.95  |
| Power Mail w/Text Merge          | 119.95 |
| Inventory Control/ICS Pro        | 69.95  |
| Ultraterm I/III                  | 44.95  |
| Ultraterm 2.0 w/auto-logout      | 59.95  |
| Modem-80 I/III                   | 39.95  |
| Modem-80 4/4P                    | 79.95  |
| SPS Statistical Analysis Mod 1   | 150.00 |
| SPS as above for Mod III inquire |        |

## ELECTRONIC BULLETIN BOARDS ONLY 74.95

RUN YOUR OWN BULLETIN BOARD

You too can be a sysop. Run your own BBS and open up your computer to the outside world. . . . . Imagine a real time electronic message center in your own home.

## COMPLETE SYSTEMS

|   |          |
|---|----------|
| BBS-80 MOD I or III (for floppies)            | \$ 74.95 |
| INFOEX-80 or I or III (will run on hard disk) | \$ 99.95 |
| FAST-80 for the Model 4/P/D                   | \$ 74.95 |
| BBS-PC IBM or Compatibles                     | \$250.00 |

Call for additional details

## SUPERDIRECTORY

Index all of your diskettes and disk files with SUPERDIRECTORY. This unique program will read all of your disk files, generate a master library sorted by file name or extension along with the appropriate disk number. Your master index can be sent to the printer or brought to the screen. We even include an editor so you can add one line of comments to each file in the library. While SUPERDIRECTORY runs on the Model I or III (4/4P/4D in the MOD III mode), it will read and index Model 4 diskettes while in the Model III mode. When ordering, Model I or Model III must be specified. Also, please inform us if you are going to run it on the Model 4P as an additional file is needed. Retail \$49.95 **SAVE 20% NOW \$39.95**

## The TRS-80 GRAB BAG SALE 39.95

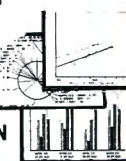
If you own a TRS-80 (Mod I/III/4), and you are a chance taker, or a gambler and LOVE surprises, our GRAB BAG may just be for you. Send us just 39.95, along with our standard \$3.00 shipping, and we will comb the far reaches of our warehouse. We will ship you a surprise package worth more than \$200.00. It may be computer books, disk programs, tape programs, other goodies or assortments of all. Programs will be guaranteed to run and replaced if they don't. Some items may be old, some current. . . . that's the surprise. Refunds or exchanges are not allowed but we know that you won't be disappointed.

## DATAGRAPH ONLY 74.95

by Micro Software  
Transform your Visicalc or Multiplan files into High-Resolution Custom Graphs on Your TRS-80 Computer and Graphics Printer

## GRAPHICS PRINTERS REQUIRED

- MX-80 GRAFTRAX OR GT +
- MX-100, FX 80/100
- LP VIII, DMP-200-2100, 120
- NEC 8023 A-C, C ITOH 8510
- IDS 460/560, 480, 80/132
- OKIDATA 82/83, 92/83, 84
- GEMINI 10/15



## PIE CHART OPTION \$34.95

MOD I, III, 4 (SPECIFY)  
PLEASE SPECIFY PRINTER

## AOS UTILITIES #1

Advanced Operating Systems

Comes in a padded binder  
Retail 99.95 **NOW 49.95**  
**SAVE 50%**

## VARKEEP

Can save variables to be passed to other basic programs, allows basic program chaining, contains a basic loader program which deletes itself to provide additional memory space, occupies 720 bytes of user ram.

## Screenpacker Plus

Allows drawings to be created by moving a cursor around the screen, provides a normal typewriter mode which produces upper- and lowercase letters, produces larger letters, nine letters per line, five lines per screen.  
Mod I or Mod III, specify.

# DiskCount Data 214-680-8268

Monday - Friday 10:00 to 8:00 CST  
Saturday 10:00 to 5:00 • Closed Wednesdays

Send Cash, Check or Money Order. Please add \$3.00 for UPS Shipping or \$5.00 For US Postage & Insurance. COD's send an additional \$3.00 COD fee.

All COD's will require cash or certified upon delivery.

Foreign orders are welcome. All shipping charges assumed by purchaser.

When ordering by mail, please specify computer and model number.

Phone Your Order In Today Or Mail To:

DISKCOUNT DATA, 2701-C WEST 15th, SUITE 612, PLANO, TX 75075



Cheerfully Accepted

# PowerSoft NewsFlash #11

Thank you for reading *PowerSoft's Newsflash*. We have been supporting the TRS-80™ for almost 7 years! Below is a list of products that you should know about if you use the TRS-80 computer. If you do not have our *Software Catalog*, call or write for one. It's free. For fastest service on a catalog request, do not use the Reader's Service Card, but call or write instead. *All products in stock for shipment within 24-48 working hours.*

✓ **Super Utility+ (or Super Utility 4/4P)** - This is the one! There is no other. This utility has been written up in every major magazine over the past years as the very best set of tools you can purchase for your TRS-80. It recovers crashed disks or files, removes passwords, modifies files or memory, reformats a disk without erasing the data, backs up "funny" disks, allows transferring of files from all kinds of other TRS-80 operating systems and much more! Approximately 70 functions in all! Only \$79.95.

✓ **Model 4 ToolBelt** - This set is known as the "Super Utility" for hard drive users. Written by the same author, it allows easy recovery and access to your data, as well as many other *Super Utility* type functions. Not protected. If you use LDOS, get *The LDOS ToolBox*. Only \$49.95.

✓ **PowerScript 4.2.2** - A major enhancement to SCRIPSIT™ for Models 4, III, or I. Allows complete control of your printer, as well as adding many new features to what you already know about SCRIPSIT™. Only \$39.95.

✓ **BACK/REST** - Our *super fast* "image transfer system" for backing up your Model 4, III, or I hard drive. Tells you how many disks you will need ahead of time, and prompts you all the way on what to do. Allows complete restoration of logical drive, or file by file basis. *5 star review!* Only \$99.95.

✓ **Supreme Rigid Drivers** - If you have a hard drive from Tandy, Percom, Bi-Tech, or Hard Drive Specialists, our drivers will make your hard drive run faster, more reliable, and allow more flexibility in setting up your drive. Smaller files sizes may be possible, as well as faster access time and dividing the drive into LDOS and TRSDOS 6, if desired. Only \$99.

✓ **PowerMAIL Plus** - The very best mailing system for the TRS-80 computer! PowerMail is written in machine language for FAST operation and sorts, which it will do up to 12 levels! Works on floppy or hard drives, and will handle a maximum of 92,000,000 names (1,150 on a 40 trk-DD diskette). Reviewed in May '84 *80-MICRO* (4 stars). *Limited time offer - order now and receive Text-Merge free of charge!* Only \$99.95 for both!

✓ **Programmer's Guide to TRSDOS 6!** - It's back by popular demand and *in-stock* for immediate shipment! This book was discontinued by the publisher, but due to the response received, it has been made available once more! This is a new edition that has been updated to include the latest versions. Brought back at \$24.95, but we offer it at only \$19.95!

✓ The response to our new TRSCROSS™ TRS-80 to PC conversion utility has been outstanding! TRSCROSS is explained in detail on **Page 21** of this issue, but for those that have used a TRS-80 and now have a PC or compatible, do not miss looking into this program! It allows you to read and convert your double density TRS-80 diskettes right in your PC! only \$89.95

U.S. please add \$3 shipping for UPS ground (\$5 for 2 day/Blue). Canada add \$4 airmail - other foreign add \$12. Texas residents must add proper sales tax. Visa/Mastercard gladly accepted. Overnight shipping available. You may also order on our XTRA-80 Sig on CompuServe. Type GO PCS56.

**PowerSoft Products**  
17060 Dallas Parkway, Suite 114  
Dallas, TX 75248 - (214) 733-4475

TRS-80 & SCRIPSIT are trademarks of Tandy Corp.

PUBLISHER  
Peter Hutchinson

EDITOR-IN-CHIEF  
Eric Maloney

EXECUTIVE EDITOR  
Michael E. Nadeau

MANAGING EDITOR  
Marilyn G. McMaster

REVIEW EDITOR  
Ryan Davis-Wright

COPY EDITORS  
David E. Essex  
Anne Freed

TECHNICAL WRITERS  
Bradford N. Dixon  
Dave Rowell

TECHNICAL EDITORS  
Mare-Anne Jarvela  
Beverly Woodbury

LOAD 80 TECHNICAL EDITOR  
Keith Johnson

EDITORIAL ADMINISTRATION  
Whitney Karr

ASSOCIATE EDITORS  
Hardin Brothers  
David Engelhardt  
John B. Harrell III  
Terry Kepner  
Thomas L. Quindry

ADVERTISING SALES  
DIRECTOR OF SALES  
William J. Smith

ACCOUNT MANAGERS  
Gary Ciocci  
Michael Wozmak  
1-800-441-4403

WEST COAST OFFICE  
1060 Marsh Road  
Menlo Park, CA 94025  
415-328-3470

SALES MANAGER  
Peter KJ Montross

ADVERTISING COORDINATOR  
Judy Walker

ADVERTISING SECRETARY  
Georgianna Forest

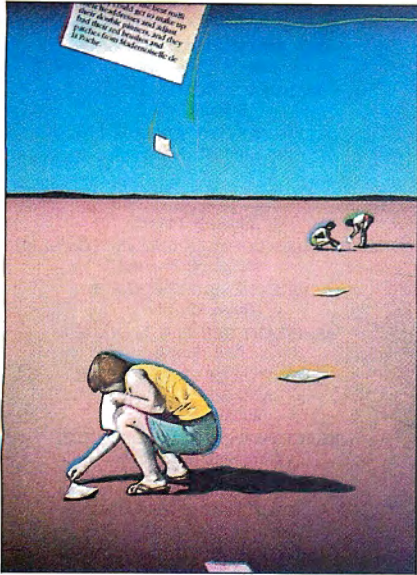
MARKETING/PROMOTION DIRECTOR  
Jane Butterfield



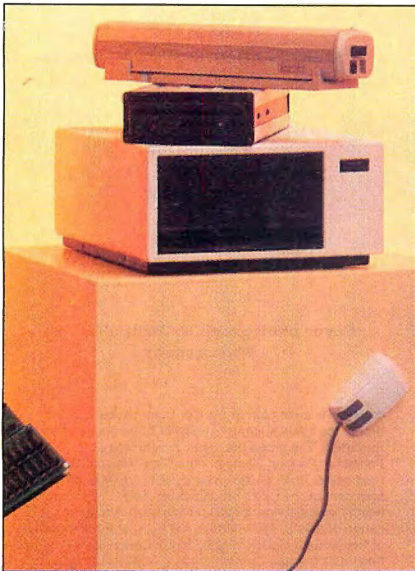
Article submissions from our readers are welcomed and encouraged. Inquiries should be addressed to: Submissions Editor, 80 Pine Street, Peterborough, NH 03458. Include an SASE for a copy of "How to Write for 80 Micro." Payment for accepted articles is made at a rate of approximately \$50 per printed page; all rights are purchased.  
\*TRS-80, Scripsit, and TRSDOS are trademarks of Radio Shack, a division of Tandy Corp.

**80 Micro** (ISSN-0744-7868) is published monthly by CW Communications/Peterborough Inc., 80 Pine St., Peterborough, NH, 03458. Phone: 603-924-9471. Second class postage paid at Peterborough, NH, and additional mailing offices. (Canadian second class mail registration number 9563.) Subscription rates in U.S. are \$24.97 for one year, \$38 for two years, and \$53 for three years. In Canada and Mexico \$27.97—one year only, U.S. funds drawn on a U.S. bank. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), \$44.97—one year only, U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail) please inquire. In South Africa contact 80 Micro P.O. Box 782815, Sandton, South Africa 2146. All subscription correspondence should be addressed to 80 Micro, Subscription Department, P.O. Box 981, Farmingdale, NY 11737. Please include your address label with any correspondence. **Postmaster:** Send address changes to 80 Micro, Subscription Services, P.O. Box 981, Farmingdale, NY 11737. Send Canadian changes of address to 80 Micro, P.O. Box 1051, Fort Erie, Ontario L2A 5N8, Canada. Return postage guaranteed.

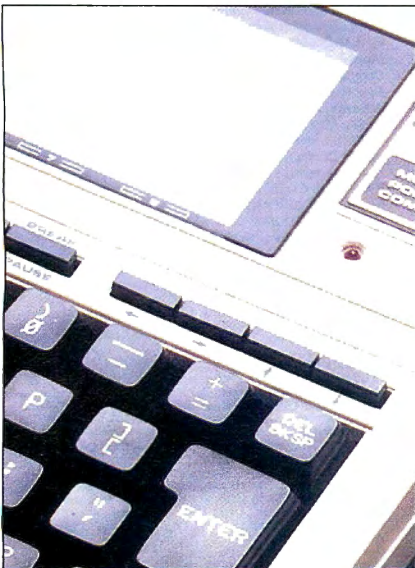
Entire contents ©copyright 1986 by CW Communications/Peterborough Inc. No part of this publication may be reprinted, or reproduced by any means, without prior written permission from the publisher. All programs are published for personal use only. All rights reserved.



page 27



page 34



page 52

## Features

- 27. **The New Scripsit Makes All the Pieces Fit**  
The real Scripsit stands up—finally.
- 34. **The Wonderful World of Tandy 1000 Add-Ons**  
Let our research be your guide to getting the best hardware for your Model 1000.
- 52. **The Modem 100** by *Jeff Holtzman*  
For about \$30, you can turn your Model 100 into a modem for your desktop computer.
- 62. **Move It!** by *John D. Wolfskill*  
Machine-language subroutines that set Model 4 text and graphics displays in motion. (Load 80)
- 68. **Making the Grade** by *Orest Kowalshyn*  
Our computerized grade book will get high marks from teachers. (Models 4 and 1000; Load 80)
- 80. **Gone Without a Trace** by *Jacques L. Robitaille*  
Removed files can come back to plague you; erased files disappear—forever. (Model 4/4P/4D; Load 80)
- 82. **Brain Breakers** by *Harry Bee*  
Test your powers of reasoning and your math skills while solving long-division puzzles. (Models III, 4, and 1000; Load 80)

## Departments

- |   |  |
|---|--|
| 6. <b>Load 80 Directory</b>   | 98. <b>Public Works</b><br>by <i>Bradford N. Dixon</i>   |
| 8. <b>Side Tracks</b><br>by <i>Eric Maloney</i>   | 100. <b>The Next Step</b><br>by <i>Hardin Brothers</i>   |
| 12. <b>Input</b>  | 112. <b>How to Use 80 Micro Program Listings</b><br>by <i>Beverly Woodbury</i>   |
| 14. <b>Feedback Loop</b>  | 114. <b>Express Checkouts</b><br><i>Software Spare Parts, C Language Routines And Utilities</i><br>Lap Coder<br>The Visible Computer: 8088 |
| 19. <b>Pulse Train</b><br>by <i>Bradford N. Dixon</i>   | 116. <b>Debug</b>  |
| 22. <b>Reader Forum</b>   | 122. <b>HOT CoCo Section</b><br>Quick Menu<br>Check PPoint<br>Doctor ASCII<br>Color Monitor  |
| 27. <b>Reviews</b><br>edited by<br><i>Ryan Davis-Wright</i><br>Scripsit Pro<br>Window Weaver<br>LX200 Trackball<br>L-PC Lite-Pen<br>Let's C<br>Eco-C<br>Name and Address System | 142. <b>New Products</b><br>compiled by<br><i>Ryan Davis-Wright</i>  |
| 86. <b>Dave's MS-DOS Column</b><br>by <i>Dave Rowell</i>  | 152. <b>Fine Lines</b><br>by <i>Harry Bee</i>  |
| 90. <b>The Art Of Programming</b><br>by <i>Bruce Tonkin</i>   |  |

# LOAD 80

**L**oad 80 gathers together selected programs from this issue of *80 Micro* and puts them on a magnetic medium for your convenience. It is available on tape or disk, and runs on the Models I, III, and 4.

Load 80 programs are ready to run, and can save you hours of time typing in and debugging listings. Load 80 also gives you access to Assembly-language programs if you don't have an editor/assembler. And, it helps you build a substantial software library.

Using Load 80 is simple. If you own a tape system, load the Load 80 tape as per the in-

structions provided. If you own a Model I or III disk system, you boot the Load 80 disk and transfer the files to a TRSDOS system disk according to simple on-screen directions. If you own a Model 4, copy the Model 4 programs from the Load 80 disk to your TRSDOS 6.x disk using the COPY command.

Not all programs will run on your system. Some Model III programs, for instance, will run on the Model 4 in the Model III mode, but not in the Model 4 mode. You should check the system requirements box that accompanies the article to find out what system configuration individual programs require.

If you have any questions about the programs, call Keith Johnson at 603-924-9471. Yearly subscriptions to Load 80 are \$199.97 for disk, or \$99.97 for cassette. Individual loaders are available on disk for \$21.47 or on cassette for \$11.47, including postage. To place a subscription order, or to ask questions about your subscription, please call us toll free at 1-800-343-0728 between 9 a.m. and 5 p.m. Or, you can write to Load 80, 80 Pine St., Peterborough, NH 03458.

## Directory

### Laptop Communications

Article: The Modem 100 (p. 52).  
System: Model 100, 8K RAM.

Turn your Model 100 into a modem.

Language: Basic.

Cassette filespec: B.

Disk filespec: MODEM/BA.

### Model 4 Graphics

Article: Move It! (p. 62).  
System: Model 4, 64K RAM;  
EDAS editor assembler (optional).

Add graphics commands to Basic.

Language: Basic.

Cassette filespecs: C, D.

Disk filespecs: FRAMER/BAS,  
DEMO/BAS, FRAMER/SRC.

### Student Management

Article: Making the Grade (p. 68).  
System: Model 4, 64K RAM.

Create an electronic grade-book organizer.

Language: Basic.

Cassette filespec: E.

Disk filespec: MARK4/BAS.

### File Eraser

Article: Gone Without a Trace (p. 80).

System: Model 4/4P/4D, 64K RAM; Assembly Language Development System (ALDS) editor assembler (optional).

Make sure that "deleted" files are gone for good.

Language: Basic.

Cassette filespec: F.

Disk filespecs: ERASE/BAS,  
ERASE/SRC.

### Math Puzzle

Article: Brain Breakers (p. 82).

System: Model 4, Models I/III  
with changes; 32K RAM.

Test your skill at long division.

Language: Disk Basic.

Cassette filespec: G.

Disk filespec: LONGDIV/BAS.

### Video Switches

Article: The Next Step (p. 100).

System: Model 4/4P/4D, 64K RAM; EDAS editor/assembler (optional).

Inside the Model 4's video screen.

Language: Basic.

Cassette filespecs: H, VCTRL,  
FCTRL.

Disk filespecs: LISTING1/ASM,  
LISTING2/ASM, INSTALL/ASM,  
LISTING4/BAS, VCTRL/FLT,  
FCTRL/FLT.

### Checksum

Article: How to Use 80 Micro Program Listings (p. 112).  
System: Models I, III, and 4;  
32K RAM.

Use our checksum program to check the accuracy of the Basic listings you type in.

Language: Disk Basic.

Cassette filespec: I.

Disk filespec: CHECKSUM/BAS.

BAS,BA = Basic SRC,ASM = source code FLT = object code

ART DIRECTOR

Anne Fleming

PRODUCTION MANAGER

Lynn Lagasse

AD/GRAPHICS PRODUCTION

Deborah Brumfield

GRAPHIC SERVICES MANAGER

Dennis Christensen

MANUFACTURING MANAGER

Susan Gross

TYPESETTING SUPERVISOR

Linda P. Canale

PRESIDENT

James S. Povec

VICE PRESIDENT OF PLANNING AND CIRCULATION

William P. Howard

VICE PRESIDENT/FINANCE

Roger Murphy

ASSISTANT GENERAL MANAGER

Matt Smith

DIRECTOR OF CREDIT SALES

AND COLLECTION

William M. Boyer

EXECUTIVE CREATIVE DIRECTOR

Christine Destrempe

CIRCULATION MANAGER

Frank Smith

DIRECT MARKETING MANAGER

Bonnie Welsh

SINGLE COPY SALES MANAGER

Linda Ruth

1-800-343-0728

AUDITS AND STATISTICS MANAGER

Susan Hanshaw

SPECIAL PRODUCTS DIRECTOR

Jeff DeTray

SPECIAL PRODUCTS MANAGER

Craig Pierce

FOUNDER

Wayne Green

Cover photograph by White-Packert  
Photography

*80 Micro* is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes over 50 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the CWCI group contribute to the *Computerworld News Service*, a daily on-line service offering the latest on domestic and international computer news. Members of the group include: ARGENTINA'S *Computerworld/Argentina*; ASIA'S *Asian Computerworld*; AUSTRALIA'S *Computerworld Australia*, *Australian PC World*, and *Macworld*; BRAZIL'S *DataNews* and *PC Mundo*; CHINA'S *China Computerworld* and *China Computerworld Monthly*; DENMARK'S *Computerworld/Danmark*, *PC World*, and *Run (Commodore)*; FINLAND'S *Mikro*; FRANCE'S *Le Monde Informatique*, *Golden (Apple)*, *OPC (IBM)*, *Theoreme*, and *Distributique*; GERMANY'S *Computerwoche*, *Infowelt*, *PC Welt*, *Computer Business*, and *Run*; HUNGARY'S *Computerworld Informatika*; ITALY'S *Computerworld Italia* and *PC Magazine*; JAPAN'S *Computerworld Japan*; MEXICO'S *Computerworld/Mexico*; THE NETHERLAND'S *Computerworld Netherlands* and *PC World*; NORWAY'S *Computerworld Norge* and *PC Mikrodata*; SPAIN'S *Computerworld Espana*, *PC World*, and *Commodore World*; SWEDEN'S *ComputerSweden*, *Mikrodatorn*, and *Svenska PC World*; SWITZERLAND'S *Computerworld Schweiz*; THE UNITED KINGDOM'S *Computer News*, *PC Business World*, and *Computer Business*; VENEZUELA'S *Computerworld Venezuela*; THE U.S. *Amiga World*, *Computerworld*, *Incider*, *InfoWorld*, *MacWorld*, *Micro Marketworld*, *PC World*, *Run*, *80 Micro*, *Focus Publications*, and *On Communications*.

*Problems with Subscriptions:* Send a description of the problem and your current and/or most recent address to: *80 Micro*, Subscription Department, P.O. Box 981, Farmingdale, NY 11737.

*Problems with Load 80 Circulation:* Address correspondence to Load 80, 80 Pine St., Peterborough, NH 03458.

*Problems with Advertisers:* Send a description of the problem and your current address to: *80 Micro*, Rt. 101 & Elm Street, Peterborough, NH 03458, ATTN: Rita B. Rivard, Customer Service Manager. If urgent, call 1-800-441-4403.

*Change of Address:* Send old label or copy of old address and new address to: *80 Micro*, P.O. Box 981, Farmingdale, NY 11737. Please give eight weeks advance notice.

*Microfilm:* This publication is available in microform from University Microfilms International. United States address: 300 North Zeeb Road, Dept. P.R., Ann Arbor, MI 48106. Foreign address: 18 Bedford Row, Dept. P.R., London, WC1R4EJ, England.

*Dealers:* Contact Kathy Boghosian, Retail Sales Manager, *80 Micro*, Pine St., Peterborough, NH 03458. (800) 343-0728.



★ ★ ★ ★ ★  
**80 MICRO**  
**JUNE, 1985**  
 Easy to use. ★ ★ ★ ★ ★  
 Good docs. ★ ★ ★ ★ ★  
 bug free. ★ ★ ★ ★ ★  
 Does the job. ★ ★ ★ ★ ★

CAMEO

ROMAN

Nostalgia

LOMBARDIAN

Pump

celtic

Playbill



OUTLINE

Pretorian

CHAINED

SHADOW

Chancery Medium

POKER

HANUKAH

BACKLITE  
BUCKLE

Rotunda

REVERBAND

Calligraphy

Old English

INCISED TRAJAN

BELLS

CITY

Mini Cubes

Small Boldface

XMAS

USA

CLIMBING

Small Bold Italics

MOON LITE

 B  
R  
I  
T  
B  
B  
O  
N  
E

Circle 91 on Reader Service card.

DOTWRITER printed these on an Epson MX-80.

# See What You Can Do With DOTWRITER!

**D**OTWRITER lets you create spectacular, eye-catching signs, invitations, letterheads, large sideways banners, catalogs, or even books. It is just what you need to turn your dot-matrix printer into a versatile typesetting machine. And it is available for your TRS-80 Model 4/4P (yes, in native mode), as well as for the Models I and III.

## WHAT IS DOTWRITER?

**D**OTWRITER uses the "bit-image" graphics of your printer to produce the kinds of stunning results shown inside the box. It is a full-function text printing program, so you can inter-mix different character sets, do centering, paragraphs, pagination, magnification, draw horizontal and vertical lines, reversals (black on white), and even print right-justified proportional text.

DOTWRITER includes the printing program, complete documentation, and fourteen useful typefaces (60 to 90 characters per typeface). We will include the 170-page Letterset Reference summary at half-price (\$10.00) with your order.

To use DOTWRITER, just write your text with any popular TRS-80 Word Processor (such as ALLWRITE or

SuperScripts), add the necessary formatting commands, and DOTWRITER will do the rest.

36 more letter-set disks are available separately. Each has 3-12 complete typefaces. The disks cost less than \$25 each and you may purchase them at any time.



## SIDWAYS SPREADSHEETS

**I**f your VisiCalc spreadsheets are too wide for your printer, our "LONGVIEW" option may be just what you need. It is an add-on that turns spreadsheets sideways so that DOTWRITER can print them down the page instead of across. LONGVIEW comes with three additional fonts.

## EQUIPMENT REQUIREMENTS

DOTWRITER needs a TRS-80 I, III, 4 or 4P with 2 disk drives and 48K of memory. Separate versions of DOTWRITER support EPSON MX-80 with Graftrax, MX-100 with Graftrax-Plus, and FX, JX, RX; C.I.TOH 8510/1550; MICROLINE 84-2/92/93; RADIO SHACK DMP 110-2100/CGP-220; GEMINI 10X/15X and other STAR printers.

We printed our samples on an Epson; sizes may vary on other printers. Many of the fonts shown above are available at extra cost.

**S**end for free print samples! We've only shown you a few of the 240 DOTWRITER fonts. For the best in TRS-80 graphics printing, we suggest you order DOTWRITER today, toll-free.

### Please specify Printer and Computer when ordering.

|  |             |
|--|-------------|
| DOTWRITER                                    | \$99.95     |
| LONGVIEW                                     | 29.95       |
| Additional Letterset disks (3-12 fonts/disk) | 24.95       |
|  | 3 for 49.95 |
| Letterset Reference Book                     | 20.00       |

**FREE** bonus disk with two Banner fonts when you order DOTWRITER!

ORDER NOW, TOLL-FREE  
 (800) 824-7888, oper. 422

## PROSOFT

Dept. C, Box 560, No. Hollywood, CA 91603  
 (818) 764-3131 Information and Same-Day Processing

TERMS: VISA, MC, checks, COD. Please add \$3.00 shipping in U.S. or Canada. Sales tax in CA. Most orders filled within one day.

# All About You

It's time for my occasional state-of-the-reader editorial, in which I tell you something about yourself and give you some of my thoughts on the direction of *80 Micro*.

We do a sometimes-overwhelming amount of reader research through our Reader Service card and mail and phone surveys. The statistics I'm going to give here are from a questionnaire we sent to 1,000 readers last May. We received a robust 50 percent response, yet another indication of the great interest *80 Micro* readers have in the magazine and the topics we cover.

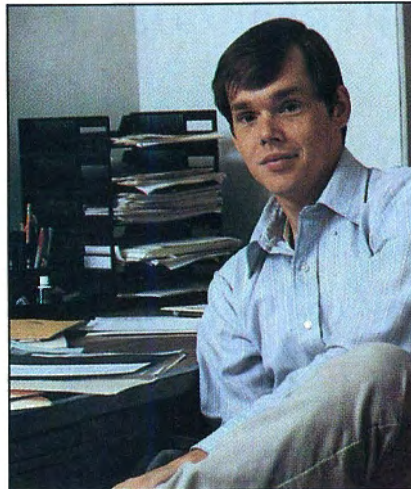
As usual, *80 Micro* readers proved to be a diverse bunch. For starters, six TRS-80 and Tandy computers penetrated 10 percent or more of our audience. Every computer Tandy has ever sold (with the exception of the Model 10, which doesn't really count) got a vote. At the top were the Model 4 at 45 percent and the Model III at 35 percent, followed by the Color Computer (25 percent), Model I (21 percent), Model 1000 (15 percent), and Model 100/200 (12 percent). Table 1 shows the complete list.

(The high CoCo figure, by the way, is because we're fulfilling the subscriptions of *Hot CoCo* magazine's former subscribers; the normal figure is between 7 and 9 percent.)

The most revealing answers were to a question on how much interest readers had in articles on various systems. Some 32 percent expressed great interest in Model 1000 articles. That's over twice the figure for Model 1000 ownership. The message seems to be that many readers are considering buying a 1000 or use an MS-DOS machine at work.

Meanwhile, only 15 percent were very interested in articles about the Model I. This confirms my suspicion that many Model I's are now second systems, dedicated to a single task, passed along to another member of the family, or permanently retired.

We also did some cross-tabulations on system ownership. Forty-three percent of the Model I owners also have a Model 4. The figure for Model III owners is 37 percent. Some 25 percent of the CoCo owners have bought a Model 1000. Nearly every Model 100/200 owner has another computer. In general, multiple ownership is the rule; the average *80 Micro* reader has 1.8 Tandy or TRS-80 computers.



## The Eclectic User

Our surveys over the years have shown that the *80 Micro* reader is distinguished by his eclecticism. The May results did nothing to dispel that notion; the respondents expressed a high degree of interest in a variety of topics.

Leading the pack as usual were articles on Basic programming, with 69 percent of the respondents indicating a high degree of interest. Software reviews were second with 60 percent and Assembly-language tutorials third with 45 percent. Education articles and hardware projects pulled 39 percent each.

Despite the general feeling that the personal-computer market is no longer the domain of serious computerists, 70 percent of our readers want programming utilities. In fact, the number is up by 2 percent from a similar 1984 survey. The interest in science-related programs has increased from 44 percent to 54 percent. Education programs also gained a bit, going from 44 to 45 percent.

On the other hand, interest in business programs dropped from 58 percent to 52 percent, while games continue to trail the pack at 29 percent.

The biggest surprise: Over 60 percent expressed a desire for personal-finance programs. This is one area we haven't fully explored, but we will in the near future.

Owners of different computers rank their software interests in slightly different order, as Table 2 shows. Of course, everyone lists utilities as number 1. But why do Model 1000 owners rank business at only number 5? Apparently, *80 Micro* readers have bought their 1000s primarily for home use.

Finally, the number of readers who don't program in Basic has increased over the years. Four years ago the figure was 6 percent; now it's 12 percent. Still, that leaves 88 percent who do program. The average reader considers himself as having intermediate skills, although 1 in 5 rates himself a beginner and 1 in 5 an expert.

## What's It All Mean?

These surveys always make me nervous. How on earth can we possibly give coverage to all those different systems?

For the last several years, we've tried to increase the number of Model 4 articles, maintain our Model III coverage, and reduce the amount of material devoted to older and less popular systems. The rise to prominence of the Model 1000, along with the rapid decline in Model 4 sales, complicates the picture. We want to give new MS-DOS users the information they need, but we also wish to serve the large and loyal base of TRS-80 owners.

So here's our tentative battle plan for 1987.

| System             | Pct. |
|--------------------|------|
| 1. Model 4/4D/4P   | 45   |
| 2. Model III       | 35   |
| 3. Color Computer  | 25   |
| 4. Model I         | 21   |
| 5. Model 1000      | 15   |
| 6. Model 100/200   | 12   |
| 7. Pocket Computer | 7    |
| 8. Model 2000      | 3    |
| 9. Model 16/6000   | 2    |
| 10. Model 1200     | 2    |
| 11. MC-10          | 2    |
| 12. Model II/12    | 2    |
| 13. Model 3000     | 2    |
| 14. Model 600      | *    |

Table 1. System ownership. The percentage of respondents who own each system. For the Model 4, we counted each 4, 4P, or 4D owner as one, regardless of whether he owned more than one type of Model 4. Ownership among the three broke down as follows: Model 4, 32.7 percent; Model 4P, 15.7 percent; Model 4D, 1.6 percent. The figure for the Model 600 was less than 1 percent.

# ♥ Your family will love your new secretary

**Allwrite!**<sup>TM</sup>

You'll love your Allwrite Word Processor from Prosoft. It's like having a personal secretary at home and in your growing business, and it saves time, too.

- Reads 10 printed pages from a disk in SIX SECONDS.
- Does a global search-and-replace in under FOUR SECONDS.

Allwrite makes it easy for you to produce top-quality, professional letters and reports. Teachers can use it to generate multiple choice exams and answer keys. (Ask us for free instructions when ordering.) Your kids will write better term papers and reports because Allwrite easily handles footnotes, table of contents, and indexes. That's why your whole family will love Allwrite!

## It's the premier word processor for the TRS-80

"Allwrite is a professional system that sets a new standard in word processing. It's powerful and easy to learn and use. . . 4-1/2 star rating."—**80 Micro**, November, 1984.

"With its speed, power, and comprehensive features, Allwrite makes an impressive argument for keeping your TRS-80 instead of buying into the 16-bit marketplace. . . check-rated Best Buy."—**Consumer Guide, 1986 Computer Buying Guide.**

## ALLWRITE helps reduce errors

ALLWRITE quickly flags formatting errors. It's Preview feature shows page breaks and where you forgot to turn off underlining, boldface, etc. It gives you more time to improve the quality of what you want to say.

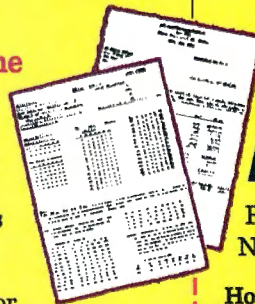


## Superb State-of-the-Art File Handling

- No upper limit on document size—chain chapters and disks together.
- Switch between chained files in six seconds, safely!
- Include stock paragraphs when printing.
- Never lose a file! Skips bad sectors, reads the rest, shows you where lost text belongs.

## Easy to learn, reduces typing time

- Store up to 22 phrases/commands at a time.
- Cue Card templates fits on keyboard.
- Natural English commands: "CE" for "Center", "Search" for "Search".
- 50 on-line HELP screens.
- Includes beginner's tutorials, hundreds of examples.
- Learn Advanced topics only when you need them.



- Comprehensive Index (over 1,000 references).
- Works with all major DOS's on Models I, III, 4, 4P, and 4D.

## Unmatched customer support

Perhaps the best reason for using Allwrite is the friendly, expert support available from Prosoft. We've supported the TRS-80 since 1980 and have worked with computers since 1962.

Order Now, TOLL FREE  
**1-800-824-7888**

OPERATOR 422

For technical information and fastest shipping, call: (818) 764-3131

**\$199.95**

Circle 30 on Reader Service card.

**PROSOFT**<sup>®</sup>

P.O. Box 560  
N. Hollywood, CA 91603



### How to Order:

Please specify computer (TRS-80 Model I, III, or 4, 48K, at least two disk drives), and your printer(s). Price includes normal shipping in U.S. and Canada. The sooner you order, the sooner you will begin to benefit from the ALLWRITE! Word Processor.

Terms: VISA, MasterCard, checks, C.O.D. Please add sales tax in California.

# SIDE TRACKS

| Model I             | Model III              | Model 4          | Model 1000       |
|---------------------|------------------------|------------------|------------------|
| 1. Utilities        | Utilities              | Utilities        | Utilities        |
| 2. Science          | Personal finance       | Personal finance | Personal finance |
| 3. Business         | Home management        | Business         | Science          |
| 4. Personal finance | Business/Science (tie) | Home management  | Home management  |
| 5. Math             | -----                  | Science          | Business         |
| 6. Home management  | Education              | Education        | Education        |
| 7. Education        | Math                   | Math             | Math             |
| 8. Games            | Games                  | Games            | Games            |

*Table 2. Interest in types of programs by system ownership.*

First, Model 4 owners should rest assured that we have no intention of abandoning the TRSDOS market. We will continue to give them our usual mix of utilities, tutorials, and reviews.

We will, however, be stepping up our coverage of the Model 1000. MS-DOS users will find many more articles written specifically for their systems, including Assembly-language utilities, Basic applications programs, and GW-Basic programming tutorials.

In addition, we'll be running more articles that apply to more than one system. Bruce Tonkin's The Art of Programming is an example of a monthly column that users of all Tandy computers can enjoy.

Also, we'll continue to convert programs whenever feasible from one system to another.

But in the magazine business, nothing is ever cast in stone, and we try to remain as flexible as possible. We hope you'll continue to give us your com-

ments and suggestions.

## New Features

If you're interested in public-domain software, you'll want to read our new column Public Works, which premieres this issue on p. 98. Each month our editors will become downloading fools as we track down the best in public-domain software for TRSDOS and MS-DOS computers. We'll tell you what's good and where you can get it, as well as give you tips on how to use your on-line time more effectively.

Next month, we're launching a new Reader Reviews box in which we give you a chance to voice your opinions on recently purchased hardware and software. If you want to participate, send us a letter listing the products you use, along with a quality rating of 1 to 5 (1 is poor, 2 is fair, 3 is good, 4 is excellent, and 5 means superior). Don't forget to tell us what computer you're using. We'd also be happy to hear your comments, good and bad.

Each month we'll tally up the responses and publish the average ratings. This will give you a sense of how other readers feel about products you might be considering buying. ■

Circle 152 on Reader Service card. **POP QUIZ**

## NEW PRINTERS ADDED! FIND YOURS BELOW. RIBBON SALE EXACT REPLACEMENTS

| PRINTER<br>MAKE, MODEL NUMBER<br>Contact us if your printer is<br>not listed. We have many more in stock.<br>We can probably RELOAD your old cartridges.  | RIBBON<br>SIZE<br>Inches<br>by<br>Yards                                       | NEW CARTRIDGES<br>From the various<br>manufacturers or made<br>in our own shop.<br>Ready to use. |             |          | RELOADS<br>You SEND your used<br>CARTRIDGES to us. WE<br>PUT OUR NEW INSERTS<br>in them. |         |           | INSERTS EZ-LOAD™<br>DROP IN, NO WINDING!<br>EXACT REPLACEMENTS<br>made in our own shop.<br>Cartridges NOT included. |            |          |            |          |         |          |
|---|---|--|-------------|----------|--|---------|-----------|---|------------|----------|------------|----------|---------|----------|
|   |   | \$15/2   | \$42/6      | \$ 78/12 | \$7/1  | \$6 ea  | 2 or more | \$15/3  | \$54/12    | \$288/72 |            |          |         |          |
| C ITOH Prowriter 1550-8510, NEC 8023-8025, APPLE DMP-IMAGEW   | 1/2 x 18  | \$18/3   | \$60/12     | \$342/72 | \$5 ea   | 3-11    | \$4 ea    | 12 or more  | \$24/6     | \$42/12  | \$234/72   |          |         |          |
| C ITOH STARWRITER F-10-40<br>DIABLO HYTYPE II   | Carbon Film Black<br>Fabric Black   | 5/16 x 130<br>NOT EX LOAD<br>5/16 x 17   | \$18/2      | \$51/6   | \$ 96/12   | \$8/1   | \$7 ea    | 2 or more   | \$21/3     | \$78/12  | \$432/72   |          |         |          |
| RADIO SHACK-TOSHIBA-COMMODORE-PANASONIC-RICOH<br>Carbon Film - DWP 210 (Hytype II)<br>DW II, DWP 410-510, RICOH 1200-1300-1600<br>Red, Green, Blue, Brown<br>Fabric (Long Life), DWP 210 (Hytype II)<br>DW II, DWP 410-510, RICOH 1200-1300-1600  | Black (1445)<br>Black (1419)<br>Colors (1419)<br>Black (1458)<br>Black (1449) | 1/2 x 52<br>5/16 x 145<br>1/4 x 145<br>1/4 x 130   | RS DMP-2200 | \$18/1   | \$18/3   | \$60/12 | \$342/72  | \$5 ea  | 3-11       | \$4 ea   | 12 or more | \$24/6   | \$42/12 | \$234/72 |
| DMP-100, LP VII, COMMODORE 1525, GORILLA BANANA (1424)<br>DMP-200, 120, (430 Inserts & Reloads Only) (1296) (1483)<br>DMP-400-420, LP VI-VIII, PANASONIC KXP-130-1093 (1418)<br>DMP-500 (130 Inserts & Reloads Only) (1236) (1482)<br>DMP-2100, TOSHIBA P1340-1350-1351-351 (1442)<br>LP-I-II-IV, CENTRONICS 730-737-739-779 (Zip Pack) (1413)<br>LP III-V, CANON A1200 (New Only) (1/2 x 5) (1414) | Black (1445)<br>Black (1419)<br>Colors (1419)<br>Black (1458)<br>Black (1449) | 5/16 x 17<br>NOT EX LOAD<br>1/4 x 25   | \$18/2      | \$51/6   | \$ 96/12   | \$8/1   | \$7 ea    | 2 or more   | \$21/3     | \$78/12  | \$432/72   |          |         |          |
| EPSON LQ 1500, (LQ 800, LQ 1000 Inserts and Reloads Only)<br>MX-FX-RX 70-80-85, LX 80-90 (5/16 x 7), IBM PC (5152)<br>MX-FX-RX 100-185-286, IBM PROPRINTER (7/16 x 20) (4201)<br>DX 20-35 Carbon Film (Multistrike), OLIVETTI ET-121-221  | Black (1445)<br>Black (1419)<br>Colors (1419)<br>Black (1458)<br>Black (1449) | Inker Loop<br>1/2 x 20<br>5/16 x 14<br>1/2 x 20<br>1/2 x 20<br>9/16 x 16<br>1/2 x 15             | \$18/2      | \$51/6   | \$ 96/12   | \$7/1   | \$6 ea    | 2 or more   | \$15/3     | \$54/12  | \$288/72   |          |         |          |
| NEC Spinwriter-Carbon Film - 2000-3500 (Reloads BCCOMPCO Only)<br>- 5500-7700 (Can Reload Most Types)<br>- Fabric - 2000-3500 (Can Reload All)<br>- 5500-7700 (Can Reload All)<br>Pinwriter P1-P2-P6<br>P3-P7   | Black (1445)<br>Black (1419)<br>Colors (1419)<br>Black (1458)<br>Black (1449) | 1/2 x 14<br>1/2 x 20<br>1/2 x 30<br>5/16 x 290   | \$18/2      | \$51/6   | \$ 96/12   | \$7/1   | \$6 ea    | 2 or more   | \$15/3     | \$54/12  | \$288/72   |          |         |          |
| OKIDATA Pacemark 2350-2410 Black<br>Microline 182-183-192-193<br>ML-80-82-83-92-93 (Call for ML-84 Prices)  | Black (1445)<br>Black (1419)<br>Colors (1419)<br>Black (1458)<br>Black (1449) | 1/2 x 14<br>1/2 x 20<br>1/2 x 30<br>5/16 x 290   | \$18/2      | \$51/6   | \$ 96/12   | \$8/1   | \$7 ea    | 2 or more   | \$18/3     | \$66/12  | \$360/72   |          |         |          |
| MANNESMAN-TALLY MT-160, RITEMAN INFORUNNER (Inker Loop)<br>MT-180-290<br>-SPIRIT 80 (SP80) COMMODORE 1526 (Multistrike)   | Black (1445)<br>Black (1419)<br>Colors (1419)<br>Black (1458)<br>Black (1449) | 1/2 x 14<br>1/2 x 20<br>1/2 x 30<br>5/16 x 290   | \$18/2      | \$51/6   | \$ 96/12   | \$8/1   | \$7 ea    | 2 or more   | \$18/3     | \$66/12  | \$360/72   |          |         |          |
| PANASONIC KXP-1080-1090-1091-1092-1592-1595   | Black (1445)<br>Black (1419)<br>Colors (1419)<br>Black (1458)<br>Black (1449) | 1/2 x 14<br>1/2 x 20<br>1/2 x 30<br>5/16 x 290   | \$18/2      | \$51/6   | \$ 96/12   | \$8/1   | \$7 ea    | 2 or more   | \$18/3     | \$66/12  | \$360/72   |          |         |          |
| BROTHER HR-15-25-35<br>COMREX DX-15, II   | Carbon Film (Multistrike)<br>Fabric (Call for Comrex 420 Prices)              | 5/16 x 82<br>5/16 x 17   | \$18/3      | \$60/12  | \$342/72   | \$5 ea  | 3-11      | \$4 ea  | 12 or more | \$24/6   | \$42/12    | \$234/72 |         |          |

SEND CHECK, MONEY ORDER, OR C.O.D. TO:

**BCCOMPCO**  
800 South 17 Box 246  
Summersville, MO 65571 • (417) 932-4196

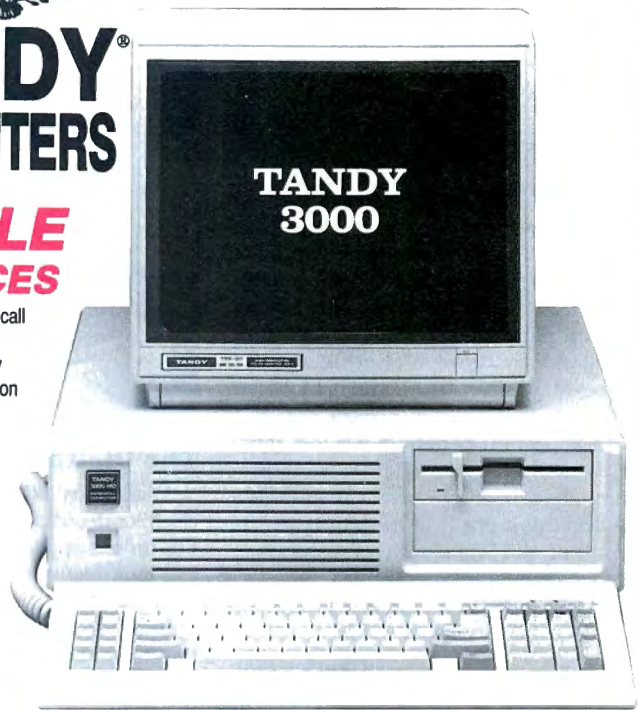
WE PAY UPS GROUND SHIPPING ON PREPAID ORDERS.  
PLEASE INCLUDE STREET ADDRESS FOR UPS DELIVERY  
FOREIGN ADD 15% U.S. FUNDS.  
MISSOURI RESIDENTS ADD 5% SALES TAX

# FREEDOM ELECTRONICS

**FREE QUOTES  
ROCK BOTTOM PRICES**



## TANDY COMPUTERS



**TANDY  
1000**

**TANDY  
3000**

**SALE  
PRICES**

Write or call  
for  
Warranty  
Information

**MODEMS • PRINTERS • SOFTWARE • DISK DRIVE  
100% RADIO SHACK® PRODUCTS AND COMPONENTS  
TOLL FREE  
800-222-9485**

**MON-FRI  
8 AM-5 PM  
CENTRAL TIME**

**TOLL FREE  
800-222-9485**

The cost of owning a computer is coming down, but they are still out of reach for a lot of people. We offer the possibility of purchasing computers, printers, software and all the extras at well below the suggested retail prices.

If you need a better way to keep track of a home budget plan or a business inventory, why not make the investment at rock bottom prices. You get the support of the biggest name in small computers, nationwide warranty, and service work. In many cases, we will ship the same day, and **to make sure you are 100% satisfied, we offer a 30 day buy back policy.\*\***

During our years of business experience we have learned the meaning of money, resources, and personnel management. We offer a way to increase your effectiveness in these areas at a tremendous savings to you. The next move is up to you. Just give us a call on our toll free hot line for the latest quotes on Tandy/Radio Shack computers, software, and equipment. It could be the best move that you will ever make.

\*\*A small handling charge for returns.

## FREEDOM ELECTRONICS

(A Division of Four-Wa, Inc.) 513 N. Grant Lexington, NE 68850

### TOLL FREE 800-222-9485

Tandy and Radio Shack are registered trademarks of Tandy Corporation

**CALL COLLECT IN NEB 308-324-7279 NEB RESIDENTS ADD 3% SALES TAX**

## C Workshop Illuminated

I appreciate John Harrell's review of *C: A Programming Workshop* (July 1986, p. 30). However, some of the details are incorrect.

It's inaccurate to say the *Programming Workshop* "forces you to write programs that don't look like native C code." The workshop supports the extern declaration, which lets you declare objects and functions at the beginning of a program, then use them before defining them. This is typical of many single-pass compilers (see *The C Programming Language*, by Brian W. Kernighan and Dennis M. Ritchie, p. 30) and is included in our tutorial.

An important benefit is our test module, which tells you whether your program exercise gives correct results. It's like having a grading assistant in the computer who checks the substance of your program after it compiles.

Finally, our correct toll-free number is 800-227-2400, extension 955.

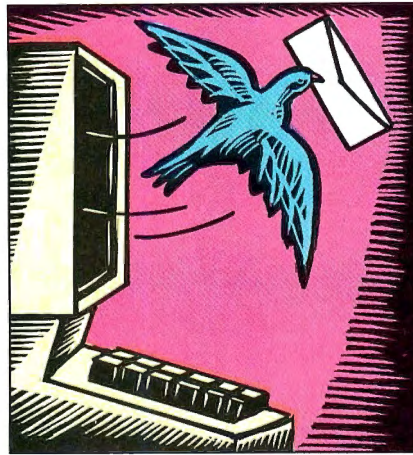
Charles Pine  
President, Wordcraft  
Oakland, CA

## Constructive Criticism

We appreciate Harry Bee's review of our product, the AFM: Automatic File Manager data base (June 1986, p. 33). He obviously tested the program to its fullest potential, uncovering its true flexibility. We can't argue with his knocking the documentation and are considering hiring a new author to rewrite it. Bee's tremendous liking for the program, despite its poor documentation, told us we should try to fix it.

AFM incorporates a number of options suggested by 230 beta users; the resulting commands aren't uniform in operation, but they all work. We are unaware of problems with the ★SCAN command as noted by Bee. The command was designed only to retrieve data that was entered without a key tab name. Once displayed, the data can be ignored, printed out, deleted, or edited to add a key tab name. Perhaps Bee was referring to the <Y>es option, which is inoperative in this mode (as stated on p. 33 of the manual).

Dennis A. Brent  
President, PowerSoft  
Dallas, TX



## The Digital Teacher

While most 80 *Micro* readers may use their computers for business or programming applications, a large percentage look to the magazine for advice on educational and self-improvement programs. What they need is guidance on finding and evaluating such programs.

With its infinite patience and ability to personalize instruction, the computer is the perfect tool for self-improvement. Available programs can teach speed reading, organizing thoughts, math skills, typing, and other skills to help people function more effectively in everyday life. I'm certain your readers would like to see more coverage of this type of software.

Mal Greenberg  
President, LSR Learning Associates Inc.  
Farmingdale, NY

## As SuperScripsit Turns

Some misinformation about Radio Shack's SuperScripsit word processor for the Model 4 has appeared in recent issues.

Joe Snyder complained that the program doesn't support headers when he uses the Block Print command (Reader Forum, January 1986, p. 28), and Jeanette Bieber-Moses and R.E. Whittaker

80 *Micro*'s BBS is open 24 hours a day. It offers programs you can download, special-interest groups, and a classified section. You can reach the board at 603-924-6985; UART settings are 300/1,200 baud, 8-bit words, 1 stop bit, no parity.

(Reader Forum, May 1986, p.25) claimed to have a solution. While headers with block prints worked as described in version 1.0, the same isn't true for versions 1.1 and 1.1.3.

In the June Feedback Loop (p. 20), Pat Koch complained about SuperScripsit crashing and hanging up the computer with nothing but an arrow in the upper-left corner of the screen. Terry Kepner's reply didn't do justice to the magnitude of her problem. Anyone who has done serious writing (documents more than 20 pages long) knows that SuperScripsit is extremely buggy. Radio Shack should be ashamed to put it on the market. You can easily lose hours or even days worth of work by not making backups. Here are some hints for frustrated users:

- Make backups frequently, alternating them between two disks.
- Don't use the Compress utility if you plan to do further editing; it somehow screws up pointers.
- Be careful editing a long document. Performing many insertions, deletions, and block moves seems to confuse the program's pointers. I find that doing a block adjustment on each paragraph after it's been edited, followed by control-W, helps a great deal.
- You can often retrieve a crashed document that has already been written to disk by calling the List file (H,PRT) at TRSDOS Ready, which lists a copy of the file to the printer in hexadecimal format. You'll find the lost text on the right side of the listing in a somewhat disorganized but readable form.

SuperScripsit is one of the best-designed word processors I've seen. It is powerful and easy to use, and offers "what you see is what you get" technology that is much more user friendly than that of other word processors for Radio Shack computers. Unfortunately, the Model 4 implementation stinks. I can't recommend it to anyone who isn't willing to spend a lot of time playing with the computer instead of being productive in their writing.

Sterling Bjorndahl  
Claremont, CA

Send your correspondence to Input, 80 *Micro*, 80 Pine St., Peterborough, NH 03458. We reserve the right to edit letters.

# Super Specials

## The ALPHA SPEECH SYNTHESIZER

Outstanding performance and value for only:

This is your chance to experience the power and pleasure that speech adds to your TRS-80. If you could read the thousands of testimonials we have received you would be convinced. Instead, our unconditional 15-day money back guarantee fully protects you.

Watch your friends faces when your TRS-80 starts talking.

**\$ 49<sup>95\*</sup>**

Thousands sold at \$75.90

\*When purchased with text to speech software.



## TALKER 4.0

Unlimited vocabulary Text-to-Speech Software. Powerful, yet easy to use; even non-programmers can enjoy it. Talker 4.0 features:

- Automatic video and/or keyboard echo (if you want it).
  - Pitch control • Voice-speed control • Spelling mode
  - Says numbers (up to 999 trillion) • Simple BASIC commands • Much more!
- Only \$39.95

80 Micro review 12/84  
 Easy to use? ★★★★★  
 Good docs? ★★★★★  
 Bug free? ★★★★★  
 Does the job? ★★★★★

**Small Print:** Hardware Power supply, speaker and manual included. Model I unit plugs into keyboard or expansion interface 40 pin bus. Model III,4,4P unit plugs into 50 pin I/O bus. Model 4P needs short 50 pin extension cable \$14.95. Use our "Y cable" (see next page) if your bus is already used. **Software** Works with all DOSes (not CPM), is 6.2K long, and relocates itself to the top of available memory. **Manual** available for \$5.

### Dr. SIGMUND

**Artificial Intelligence at work!**  
 If you want to show off your computer, run "Dr. SIGMUND" and see their expressions as your TRS-80 has an intelligent conversation with you. Even you will be impressed!

### PERSONALITY TEST

By Dr. James E. Hord, Jr. for your ultimate entertainment. This elaborate personality test will amaze you, and puzzle your friends. Besides talking to you, it will print a painfully accurate report.

### TALKING WORD PROCESSOR

By George McCoy of Rehab Research. The Alpha Speech Synthesizer was chosen for this functional word processor with full speech capability. A perfect example of computer speech.



Each of these three programs require 48K and are available on disk only. The Alpha Speech synthesizer is required for speech. Each program is only ..... \$29.95

**SPECIAL: ALL THREE FOR ONLY \$59.95**

## NEWCLOCK

Model I \$39.95  
 Model III,4 \$59.95

**The right time at the right price!** Keep the time and date with quartz accuracy, even when your computer is off. The backup lithium battery (included) will last for over 2 years. Software on tape or disk, please specify. Use "TIMESSET" once to set the clock. Use "SETCLK" to set your computer's internal clock (at power up) or use "TSTRING" so that the "TIMES\$" function reads the Newclock.

Connection: Model I: plugs into the keyboard or expansion interface. Model III,4,4P: plugs into the 50-pin I/O bus. 4P needs short 50-pin extension cable \$14.95 Compatible with all operating systems.



Circle 17 on Reader Service card.

**800-221-0916**

Orders Only. NY & info call  
 (718) 296-5916

Hours: 9-5 Eastern Time

Add \$3.00 per order for shipping. We accept Visa, MC, checks, M.O. C.O.D. add \$3.00 extra. N.Y. residents add sales tax. Shipping to Canada is \$5.00 Overseas, FPO, APO add 10%



**ALPHA Products**

79-04 Jamaica Ave., Woodhaven, NY 11421



Send your questions or problems dealing with any area of Tandy/Radio Shack microcomputing to Feedback Loop, 80 Micro, 80 Pine St., Peterborough, NH 03458.

### SuperScripsit Blues

**Q:** What are the patches to eliminate the delta from Model III SuperScripsit 1.0.3 and from Model 4 SuperScripsit? (James Stevens, Fennville, MI)

**A:** For Model III version 1.0.3, use:

```
PATCH SCRIPSIT/CMD (ADD = 56AC, FIND = 20, CHG = 18)
PATCH SCRIPSIT/CMD (ADD = 68BE, FIND = 20, CHG = 18)
PATCH SCR 34/CTL (ADD = 9A19, FIND = 20, CHG = 18)
```

For version 1.0.3 with LDOS, use:

```
PATCH SCRIPSIT/CMD (D04, C0 = 20)
PATCH SCRIPSIT/CMD (D17, 1E = 20)
PATCH SCR 34/CTL (D02, FA = 18)
```

For Model 4 version 1.01, use:

```
PATCH SCRIPSIT/CTL (D11, F0 = 18: F11, F0 = 28)
PATCH SCRIPSIT/CTL (D14, 28 = 18: F14, 28 = 20)
PATCH SCR35/CTL (D01, 30 = 18: F01, 30 = 20)
```

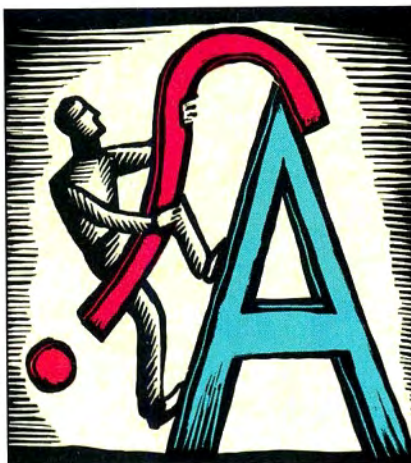
**Q:** I am sometimes unable to retrieve a SuperScripsit (1981 version) file on my Model III. I get an "attempt to read past end of file" message and the file remains locked up. The problem seems to happen when someone forgets to quit the file when they're finished.

Is there an easy way to get at the file? (Lynn G. Brown, Niantic, CT)

**A:** Several people wrote us with the same problem. It often happens after a disk error (which frequently goes unreported) in writing to the indexing portion of the file, relative sectors 1-7. If an incorrect value is written here, SuperScripsit might not find what it is searching for where it is told to look.

Dirty disk-drive heads could be the culprit. Clean your drives and make sure they are properly aligned. If the disk error still occurs, try Ken Pavlicek's recovery program ("Full Recovery," June 1985, p. 57).

**Q:** The "no more space left on this diskette" business in SuperScripsit that Pat Koch described in June (p. 20) is driving me nuts, too. My SuperScripsit files and program are all on a hard disk, and the maddening phrase pops up when there are thousands of free K left and the files



are no bigger than 65K to 72K.

Is there a way to get inside SuperScripsit and disable the program that kicks off the error message? (Charles W. Barnes, Flagstaff, AZ)

**A:** Disabling the error message won't help; the problem arises because SuperScripsit and TRSDOS have different ways of arranging their files and indexes on disk.

SuperScripsit limits the size of its files and uses relative sectors 1-7 for its index. It can hold up to 255 4-byte index clusters, each with room for up to four sectors of information. This setup gives you a maximum of 1,020 sectors of text, plus up to 16 additional sectors for header and footer information. We know of no way to get around this problem. Can any of our readers help?

### Monitor Connection

**Q:** I recently purchased an amber monitor, intending to use it externally with either my Model 4 or my 4P. How do I set it up? (Harry Akins, Parsons, KS)

**A:** The word from Radio Shack's technical department is that it can be done, but not very easily. They suggest making sure you know what you're doing before attempting the work.

Be aware that the computers' separate video and synchronization signals might differ from those expected by the amber monitor. Also, the power supply might not be enough to drive two monitors; the Radio Shack techies thought there might be enough juice in the system, however.

It would be better to take the job to someone who knows both the Model 4 and stand-alone monitors.

### Double Trouble

**Q:** I'm having trouble converting my Model III to double-sided drives. Everything works great on LDOS, but no one can tell me how to configure TRSDOS to run double-sided drives. I'm running two TPI 52S drives as drives zero and 1. (D. Scott Joy, Pottsville, PA)

**A:** As best we can determine, there are no patches to TRSDOS 1.3 that will recognize double-sided drives.

### Attention Cursor Sufferers

**Q:** I am a migraine victim and hypersensitive to flashing or blinking lights, which frequently trigger severe headaches. Because of this, I have been trying to find out how to disable the blinking cursor on a Tandy 1000, with no success so far. (C.H. Fridley, Brigham, UT)

**A:** There is no permanent way we know of, but here is a Debug script for CURSOFF.COM, which makes the cursor invisible. Since it isn't permanent, you must run it after any program that turns the cursor back on.

```
DEBUG
A
MOV AH,1
MOV CX,2000
INT 10
MOV AH,4C
INT 21
CONTROL/C
RCX
B
N CURSOFF.COM
W
Q
```

### Upgrading the 1000

**Q:** I've installed a 256K Memory Expansion Board (catalog number 25-1004) in my Tandy 1000. In addition, I've installed 16 chips in the blank IC sockets on this board to bring the memory up to 384K. What is the best way to bring the memory up to the full 640K?

Also, I am considering installing a hard disk. What brand do you recommend? (J.E. Chambers, Evanston, IL)

**A:** Many good memory boards are advertised in *80 Micro*. Get one without direct memory access, since you already have it in your expansion board.

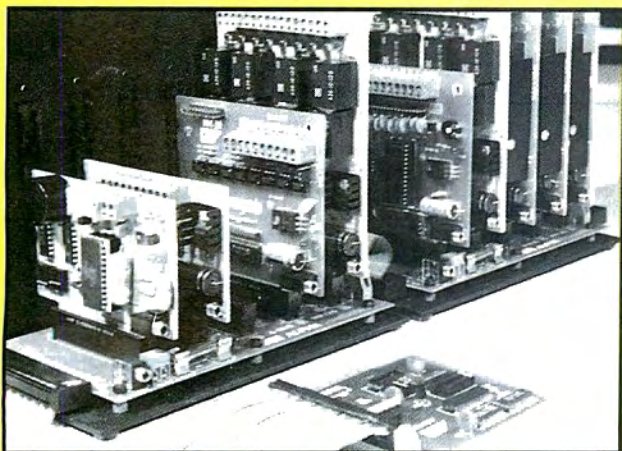
As for the hard drive, make sure you have BIOS version 1.01 if you install a non-Tandy hard drive, and that the drive has been modified to work on the 1000.



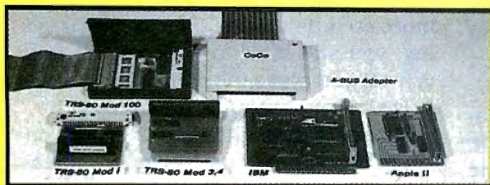
# The Amazing A-BUS

What will you do with it?

**NEW**



An A-BUS system with two motherboards. ↑



## A-BUS Adapters ↑

IBM PC, XT, AT and compatibles.

Uses one short slot.

Tandy 1000, 1200, 2000, 3000.

Apple II, II+, IIe. Uses any slot.

TRS-80 Models 100, 200. Plugs into

40 pin socket. (Adapter has another socket).

TRS-80 Mod 3, 4, 4D. Fits 50 pin I/O bus.

TRS-80 Model 4P. Includes extra cable.

TRS-80 Model I. Plugs into 40 pin I/O bus.

Color Computers (Tandy).

AR-133...\$69

AR-133...\$69

AR-134...\$49

AR-135...\$69

AR-132...\$49

AR-137...\$62

AR-131...\$39

AR-138...\$49

## A-BUS Motherboard MB-120: \$99

Will accommodate five A-BUS cards. A sixth connector allows a second motherboard to be added to the first (with connecting cable CA-161...\$12). Up to five motherboards can be joined this way to a single adapter. The motherboard is mounted on a sturdy aluminum frame with card guides.

• A three foot cable connects the A-BUS Adapter Card to the first motherboard. CA-163...\$29

• If you use only one or two cards, the motherboard is not required. One card will plug directly into the CA-163 cable. Cable for two cards: CA-162...\$39

## Relay Card

RE-140: \$129

8 industrial relays on board. Contacts are rated at 3 amps. You can control up to 64 cards (512 relays) using several motherboards. Jumpers are used to simply select the card address. The card is easily controlled in BASIC with "OUT" or "POKE". For example, OUT 1,0 turns all the relays off on card #1. Eight LED's show which relays are on.

## Digital Input Card

IN-141: \$49

It's safe and easy to connect and read switches, keypads, thermostats, alarm loops, etc. The eight inputs can monitor the presence of voltage or switch position. Simple INP or PEEK commands read the status (On or Off) of the inputs. Each input is optically isolated for convenience and safety.

## Analog Input Card

AD-142: \$119

With this 8 bit, 8 channel A/D converter, your computer can read voltages, temperatures, pressures, light levels, etc. Take over 100 readings per second in BASIC (several thousand with machine language). It's simple to use, for example: OUT 1,3 selects channel #3, then A=INP(1) reads the voltage on that channel. Input range: 0 to 5.1V. Resolution: 20mV. Conversion time 120us.

• **SHEILA** wanted to set up a variety of experiments in her lab. With an A-BUS, the computer can watch the mice instead of Sheila.

• **HARRY** has a model railroad layout that he wished to automate. Now his home computer controls the engines, gates, signals, etc. through the A-BUS.

• **BOB** tests electrical fixtures as they leave the assembly line. He develops test equipment quickly with inexpensive, off-the-shelf, and easy to use A-BUS cards.

Before they chose the A-BUS, they asked:

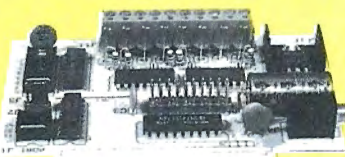
- **What if I change computers?** Incredibly, this is as simple as replacing the inexpensive adapter card. The A-BUS cards work with hundreds of different computers.

- **What about my limited budget?** Good news! The A-BUS is the most economical system for any computer, anywhere. Also, you pay only for the functions you need.

- **I'm not an engineer. Can I use the A-BUS?** If you can wire a switch, you can use the A-BUS. Simple OUT and INP commands control everything. (Apple and CoCo use POKE and PEEK). You'll like the detailed user's manuals.

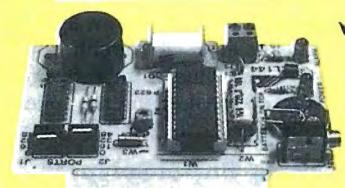
- **What would I need?** Select the A-BUS cards, and slip them into a motherboard. Plug the adapter into your computer and connect them with a cable.

- **Can I get the user's manuals?** Yes, the complete set for all the A-BUS cards is available for only \$10. Also, you are welcome to call our tech line about your application.



## 12 Bit A/D Converter AN-146: \$109

This high performance analog to digital converter features accuracy to 0.025%, 130ms conversion time, sign and over range indication. The basic input range is -5 to +5 volts, with 1.2mV resolution, but the gain of the on-board amplifier can be set to measure microvolts. Ideal for a strain gauge, thermocouple, pH meter, etc.



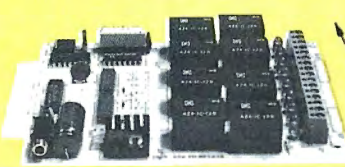
## Motor Controller

ST-143: \$69

Stepper Motors are the ultimate in motion control. The special package (below) includes everything you need to get familiar with stepper motors: Each controller card drives two stepper motors (12V, bidirectional, 4 phase).

Motor: 48 steps/revolution, 300 steps/second, 1/4" shaft: MO-103...\$15. Power supply: PS-126...\$10

**Special Package:** the controller card, two stepper motors, and power supply: PA-181...\$99



## Clock with Alarm

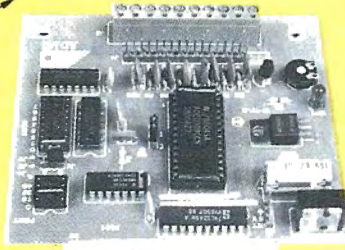
CL-144: \$89

It's the most powerful clock/calendar available. The features: • 5 second/month accuracy. • Keeps time, date, and alarm for 5 years (even with computer off). • Can time events down to 1/100 second. • Periodic "chime". • Full time and date alarm. • Four alarm outputs: Computer, LED, Buzzer, and Reed Relay. • Easy to use.: for example H=INP(1) reads the hours, Y=INP(6) reads the year, etc.



## Latest Developments

|                                      |        |
|--------------------------------------|--------|
| Voice Synthesizer                    | VS-153 |
| 15 Bit Analog to Digital Converter   | AD-155 |
| Intelligent Stepper Motor Controller | ST-154 |
| Digital to Analog Converter          | DA-147 |
| LCD Display (one and two line)       | LD-151 |
| Touch Tone® Decoder                  | PH-145 |
| Counter Timer                        | CT-154 |
| 24 Line TTL Input/Output             | DT-148 |



Order line **800 221-0916**

Except in NY

Info and NY orders: (718) 296-5916

Technical info: (203) 656-1806

All lines open weekdays 9 to 5 NY time

Add \$3.00 per order for shipping.

We accept Visa, MC, checks, M.O.

C.O.D. add \$3.00 extra.

NY residents add sales tax.

Shipping to Canada is \$5.00 Overseas, FPO, APO add 10%

Circle 17 on Reader Service card.



**ALPHA Products**

79-04 Jamaica Ave., Woodhaven, NY 11421

## Trading Chips

**Q:** In other computer magazines, I've seen software advertised that lets IBM PCs (and other 8088 computers) emulate 8080 processors and run CP/M software. Some of these packages contain software only, while others include a NEC V20 chip that allows the CP/M emulation to run at 4 megahertz (MHz), instead of the 1 MHz of the software-only packages.

If I installed a V20 chip in my Tandy 1200, could I run TRSDOS 6.2 and other Model 4 software? (Robert P. Johnson, Seattle, WA)

**A:** No. TRSDOS uses a Z80 chip, which is more advanced than the 8080 and has additional instructions.

## Line-Feed Gremlin

**Q:** I use MicroPro's WordStar on my Tandy 1000 with an Epson RX-80 printer. I have been unable to perform a carriage return without a line feed, which prevents me from using the bold, double-strike, underscore, and strikeout features unless I use back-spacing. I've used the MS-DOS commands LF,MODE LFOFF to turn off the auto-line feed, and the DIP switch is off.

WordStar was installed on my system with the correct printer codes. I have also used it with my printer on an IBM PC without the carriage-return/line-feed problem. Any suggestions? (Steven Beck, Sebastopol, CA)

**A:** Other readers have written saying they have encountered the same problem with the Epson LX-80 and Gemini 10X printers. With Epson printers and clones (including the Gemini), you must disable line 14 at the printer end of the cable. Line 14 is Epson's AUTOLF signal; in Tandy computers, line 14 is grounded. Use a small piece of tape to cover the pin before testing to see that you've found the right line to be cut. (See Dave's MS-DOS Column, September 1985, p. 82, for further details on carrying out the modification.)

## Profile in Focus

**Q:** In Radio Shack's Profile 4 Plus, is there a way to print address labels without blank lines in the middle on two- or three-line addresses if the fields are set for up to four-line addresses?

Also, according to the manual, the screen indicator & with a field length of five should give an automatic update of the year and month. It only gives the day and month—not much use. Is there any way to make it do what it should? (Jim Foxvog, Comer, GA)

**A:** According to Tandy techies, Profile 4 Plus will print the blank lines once a field has been set. The program does

have a blank-line suppressor, but it won't function for labels.

Use the screen indicator @ to make Profile print the update year and month. The instruction manual incorrectly says to use the &.

## Readers Respond

### Mr. Speaker

In the May 1986 Feedback Loop (p. 16), we mistakenly told Gene Fowkes that a speaker is installed in all Model 4's. In fact, cassette Model 4's do not have speakers—only the disk models do, a fact pointed out to us by readers Chris Rogers of Palm Harbor, FL, and Ronald Hooker of Big Bend, WI.

Cassette models that have been upgraded to disk have sound software on DOS but still require installation of the speaker and a small sound board, according to Chris. You can buy the sound board (catalog number 26-1069, part number AX-9365 for the board, AW-3162 for the cable) from Radio Shack National Parts Division, 900 E. Northside Drive, Fort Worth, TX 76102; the phone number for orders is 817-870-5662. You can also order both the sound board and speaker from Radio Shack Computer Centers.

Ron wire-wrapped a small board following the sound-option schematic in the Model 4 Technical Reference Manual, substituting an 8-ohm speaker for the transducer in the circuit, and then adjusting the value of the series resistor between the speaker and the collector of the transistor for the desired volume.

### Patching SuperScript

In the March 1986 Feedback Loop (p. 14), Marjorie Wootton asked how to disable SuperScript's blinking cursor. David Goben of Story City, IA, sent us patches that do the job in several SuperScript versions.

In version 1.02, use:

```
PATCH SCRIPSIT/CMD (ADD = 69A0, FIND = 20041B, CHG = 28FB00)
```

```
PATCH SCRIPSIT/CMD (ADD = 69A3, FIND = BA20F7, CHG = 000000)
```

In version 1.03, apply the patches above, but change the ADDs to 6EA1 and 6EA4, respectively. In version 1.02 with LDOS, use:

```
PATCH SCRIPSIT/CMD (D18,04 = 28 FB 00 00 00 00)
```

In version 1.03 with LDOS, use:

```
PATCH SCRIPSIT/CMD (D1D,19 = 28 FB 00 00 00 00)
```

Finally, in Model 4 version 1.1, use the following patch:

```
PATCH SCRIPSIT/CTL (D27,1B = 28 FB 00 00 00 00:F27,1B = 20 04 1B BA 20 F7)
```

## Advice for Pat Koch

In the June 1986 Feedback Loop (p. 20), Pat Koch reported having trouble accessing files and typing long documents in SuperScript.

Robert M. Washburn III of Whittier, CA, thinks Pat's "record number out of range" problem stems from resetting the machine while the file is open. Without an end-of-file marker, the computer is free to look beyond where you tell it to look. To correct the error, write a couple of lines under another name and append them to the damaged file using the "strip" parameter (pp. 1-17 in the TRSDOS 6 manual).

Robert recommends copying the System/JCL and MEMDISK/DCT controls to the SuperScript operating disk and using MEMDISK in high memory as drive 2. You should intermittently compress the file to a data disk in drive 1 to allow more records in each file. For proofreading, you still have to copy the file onto drive 2 and place the dictionary in drive 1. Disk input/output is much faster.

Robert H. Kluckhohn, Jr., of Vancouver, VA, suggests using the Compress Document utility at the end of each work session, and more often during heavy-duty use. He also recommends reading *TRS-80 Word Processing with SuperScript* by David A. Kater and Byte Books.

Charles Barnes of Flagstaff, AZ, says Pat can avoid the typing-speed problem by enabling the Model 4 type-ahead feature with SYSTEM (TYPE = YES). Also, SETKI (WAIT = 10, RATE = 1) will give her an "extremely nimble" keyboard, according to Charles.

### MicroChess Moves

R.P. Sainsbury of Landford, England, writes that using James A. Carrier's method for transferring MicroChess from tape to disk (May 1986, p. 18) is complicated by the fact that Radio Shack released two versions of the program.

The first version was recorded in a special format to facilitate copy protection and to work on a 4K machine. It begins with a short loader program that in turn loads the game into low RAM (overwriting TRSDOS) and then reads the instruction page directly onto the screen. The normal transfer techniques don't work with this version.

Radio Shack introduced a second MicroChess version for the Model III using a common recording format. The tape transfers easily to DOS because it sits above 6000 hexadecimal (hex), and is compatible with both cassette and disk Model IIIs, according to R.P. He had trouble loading an old tape into his Model III, but Tandy replaced the tape with a new version that can easily be put

on disk, and which works with TRSDOS 1.3 and LDOS.

Pat Anderson of Fall City, IA, says the real question is whether the program will run in the disk environment after being moved. Tape programs that load into memory at starting addresses lower than 5200 hex conflict with TRSDOS 1.3; MicroChess loads at 6C00 hex.

If the load address of a program moved from tape to disk conflicts with TRSDOS—as does Radio Shack's Gammon Gambler, which loads at 4300 hex—you can still fix the problem with PowerSoft's Super Utility Plus (17060 Dallas Parkway, Suite 114, Dallas, TX 75248, 214-733-4475).

Pat suggests moving the tape program to disk with the TRSDOS Tape utility. Choose the Offset File option from the Super Utility Plus file utilities. At the prompt for the new load address, answer with any address over 5200 hex, and answer yes to the "Add appendage?" prompt. The program loads itself safely above TRSDOS, relocates, and begins execution at its normal address. It overwrites TRSDOS, so you must reboot when your program ends, according to Pat.

David Trapasso offered a fine tape utility in his article, "Tape It Easy" (January 1984, p. 112). He also explained start, end, and transfer addresses. The utility is available through 80 Micro's Load 80 service (p. 6).

## Missing MEMDISK

Dave Krebs of Amherst, OH, writes that while installing MEMDISK, he noticed his Model 4 produced an error message similar to the one C.W. Preble described in May (p. 17): "Verify error in bank 1 at location X'8000." MEMDISK was in bank 2.

Dave fixed the problem by buying a 150-ns 4164 chip from Radio Shack (part number 276-2506) for \$3.95. He found the faulty RAM by substitution and installing MEMDISK as he moved the new chip down the row from the top.

## The Mating Game

In the June Feedback Loop (p. 20), Leon Field asked for a way to make the Epson printer compatible with the Model 4P.

Chris Clinton of Rolla, MO, reports that the printer driver in the Model III ROM image (MODEL3/III) for the Model 4P differs from its counterpart in the Model III ROM. The differences can cause problems when the Epson is in a graphics mode. The solution: POKE 16891,2.

## False Stop

In the May Feedback Loop (p. 16), Salathiel Pineda asked why Microsoft's Fortran compiler aborts after compilation when used in a compile-link-and-go JCL file on his Model 4.

John McLeod had the same problem and was able to get background information from the Radio Shack support line in Fort Worth. Upon exiting to TRSDOS, the Fortran compiler invokes an @EXIT supervisory call (SVC), which checks the value in the HL register pair. If the value is zero, normal termination occurs. If not, the compiler returns an abort code to the JCL stream and the JCL stream aborts.

John says he used Debug and a copy of the F80/CMD file to solve the problem. He discovered the HL register pair was set and never cleared before executing the @EXIT SVC. He used the Patch command to install the following:

```
PATCH F80/CMD (X'5CBD' = 21 00 00 3E
16 EF)
```

## 2000 Reading List

In the April Feedback Loop (p. 14), Russ Kingman asked for an easy-to-understand instruction book for the Tandy 2000.

Charles B. Lowry, Sr., of Toledo, OH, recommends *Learning Basic for the Tandy 1000/2000* by David A. Lien (Radio Shack catalog number 25-1500, \$19.95), while Hartley Grim of Rockville Center, NY, suggests *Mastering the Tandy 2000* by Dan Keen and Dave Dischert (Tab Books Inc., Blue Ridge Summit, PA 17214)

## Seeking Help

► Brad Timerson (Newark Central School District, Senior High School, 625 Peirson Ave., Newark, NY 14513) wants advice on hooking up a TRS-80 Model I and a Heathkit Weather Station to display and record weather data at prescribed time intervals.

► Richard A. Stanford (104 E. Kenilworth Drive, Greenville, SC 29615) is having trouble with the boot disk for his Model 4 MicroMERCURY Xcalibur MS-DOS board. He'd like to hear from other Model 4 Xcalibur users.

► Model III owner G. Kerr (81 Gaskill St., Canowindra 2804, NSW, Australia) wants information on a F.A.X. decoder program that would enable him to get weather maps for his hot-air balloon center.

► Arthur Meacham (First Southern Methodist Church, 6011 Fairfield Ave., Shreveport, LA 71106) would like a copy of Jerry O'Dell's *TRS-80 As a Controller*, which was published by Wayne Green Books and is now out of print.

► Edward Lange (67 Dundalk Ave., Baltimore, MD 21222) is looking for advice on using SuperZap to modify Model I Meteor Mission 2 on NEWDOS/80 version 2.0. He wants to display initials along with the high-score message.

► Rodney Martinez (1016 Pauline St.,

New Orleans, LA 70117) recently acquired a used Model I. He needs an expansion interface, cassette-based compiler, printer, modem, and disk drives to round out his system.

► Pat Anderson (5420-324th Pl. S.E., Fall City, WA 98024) wonders how to go about transferring Zaxxon and Meteor Mission from tape to disk (both games load in two parts). Pat says the TRSDOS Tape utility will move only the first part, and that the computer reboots if you start the utility at the silent spot on the tape. The addresses for the first part are START = 3C00H, END = 41E4H and TRANSFER = 7F9CH. Address 3C00 hex is the start of video memory, and the transfer address is outside the start and end addresses.

► R. Verbruggen (Kievitlaan 12, B-2228 Ranst, Belgium) seeks instructions on converting Model III VisiCalc from QWERTY to AZERTY keyboard format, and would like to do the opposite with SuperScript 01.01.00BN.

► Gary W. Shanafelt (2128½ S. 18th St., Abilene, TX 79605) wants to buy or trade the disk version of Volcano Hunter, a Model I/III game sold a couple of years ago by Lap Video Entertainment.

► W.J. Russell (41 Russell Terrace, Woodville Park, South Australia 5011) is looking for the 2.3 version of Super, a data-base manager made by the Institute for Scientific Analysis in Media, PA. He owns the Models 100, III, and 4; the latter two have double-sided drives.

► Keith LeMay (3305 Little Walnut Road, Silver City, NM 88061) wants to add the Postrite form-letter module to Postman 2.9, which he runs on a Model I. The program was made by Alger Software and distributed by Soft Sector Marketing.

► Fred Pieters (Kleine Heide 22, 9830 St.-Martens-Latem, Belgium) needs a Model III/4 disk and cable to run a Microtronics RM1000 radio modem (for the Model I) on his Model 4.

► Fred Newsom (79-19 263rd St., Floral Park, NY 11004) and Dale Snell (701 Coleman Hall, Lubbock, TX 79406) want to know if anyone still supports the CHROMATrs add-on box for color and sound effects on the Models I and III. The product was advertised in the April 1983 *80 Micro* (p. 384) by the now-defunct South Shore Computer Concepts Inc. Fred also wants advice on the fair market price for a used CHROMATrs, which he plans to run on his Model 4.

► Randy Landgraf (2720 NW Hill Road North, McMinnville, OR 97128) seeks a copy of Asylum II to run on his Model 4. He has been unable to locate the manufacturer, Med Systems Software, at their last known address in Chapel Hill, NC. ■

**NEW!**  
**CONV4TOPC**  
 For TRS-80 Mod 4 users.  
 Plus other great utilities.

# CONVERT MOD I/III BASIC PROGRAMS and FILES For Use On The IBM PC, TANDY 1000, 1200HD, 2000

Here's time and money saving news for thousands of TRS-80 Mod I and Mod III owners who would love to move up to state-of-the-art hardware! EMSI's conversion package contains utilities to solve both problems facing those who want to upgrade:

## **PROBLEM 1—HOW DO I GET FROM HERE (Mod I/III) TO THERE (PC)? Do I need to retype everything, buy modems, RS232's, cables, and communications software?**

**ANSWER:** None of the above! Use the HYPERCROSS utility included with our package! HYPERCROSS makes the entire disk transfer process very simple—and fast. All the work is done right on your Mod I/III. HYPERCROSS lets you format a diskette readable by all PC's in one drive and copy files directly to it from a Mod I/III diskette. After the transfer, take the PC diskette out of your Mod I/III and put it in your PC. Simple as that! (Mod I's need a doubler.)

## **PROBLEM 2—ONCE I'M THERE, HOW DO I CONVERT MY MOD I/III PROGRAM TO RUN ON A PC?**

**ANSWER:** Use our CNV3TOPC utility to do 95% or more of the conversion for you. It automatically inserts all required spaces between keywords, replaces PRINT@'s (even those with variables) to LOCATE's, adjusts TAB addresses, corrects the exponentiation symbol, replaces the % symbol in USING statements with a backslash, removes down arrows, optionally removes REM's and flags and lists unresolved line numbers. It even allows for Mod I/III screen PEEKs and POKEs.

And, our thirty page user guide is packed with examples and hints showing how to make any manual program changes required after using CNV3TOPC.

*"... It's the best such program I've seen, well worth it's higher price over similar programs. . . The conversion program performed flawlessly."*  
 Mr. Gary Shade, 80 MICRO, May 1985 (4½ stars).

*"Truly, a Superior Quality Software Package. Count me among your list of satisfied customers."*  
 Waltham, MA

*"I would gladly recommend the package to anyone making the change to an IBM type machine."*  
 Wauwatosa, WI

*"What a time saver. Thanks for a great product."*  
 Denver, CO

*"Excellent! The manual alone. . . is worth the price."*  
 Westport, CT

*"The fine points of conversion you cover in the manual are excellent."*  
 Salem, OR

*"An excellent product. Thank you for the service."*  
 Mapa, CA

*"Works like a charm! Congratulations."*  
 Odenton, MD

## **CONV3TOPC V2.0 \$139.95**

**(Package includes: HYPERCROSS and CNV3TOPC)**

AVAILABLE WORLDWIDE through Radio Shack's Express Order Software (Cat.No. 90-0345)

Visit a R/S Computer Center and review the CONV3TOPC DEMO. It provides complete package details and will answer all your questions. If your store doesn't have the DEMO yet, ask them to order it thru ICST-FC# = FCO-925.

### OTHER EMSI SOFTWARE

#### THE NORTON UTILITIES LIST \$99.95, OUR PRICE \$59.95

|   |  |
|---|--|
| <p><b>CONV3TOPC V2.0</b>—(WITH Hypercross) \$139.95</p> <p><b>CONV4TOPC V1.0</b>—(WITH HYPERCROSS) \$139.95<br/>                     Same as CONV3TOPC V2.0, but specifically for mod 4 BASIC and FILES</p> <p><b>CONV3TOPC V2.0 DEMO</b> (Runs on any PC) \$20.00</p> <p><b>HYPERCROSS</b>—Mod I/III, PC-DOS format \$49.95</p> <p><b>CROSS REFERENCE</b>—For PC BASIC programs. Lists all referenced variables, line numbers, etc. \$24.95</p> <p><b>FASTSORT</b>—Machine language SORT callable from PC BASIC. Great PC subst. for Mod III BASIC's CMD"O" command. \$24.95</p> <p><b>PEEKs 'n POKEs</b>—Over 50 utilities that enable PC BASIC programs to access and modify PC/MS-DOS system functions. \$29.95</p> | <p><b>CONV3TOPC V2.0</b>—(WITHOUT Hypercross) \$119.95</p> <p><b>CONV4TOPC V1.0</b>—(WITHOUT HYPERCROSS) \$119.95</p> <p><b>CONV3T04</b>—Mod I/III to Mod 4 BASIC \$49.95</p> <p><b>HYPERCROSS</b>—Mod 4, PC-DOS formats \$49.95</p> <p><b>ISAM ROUTINES</b>—Incorporate these routines in your PC BASIC programs. They provide keyed access to random files &amp; complete file maint. \$69.95</p> <p><b>RAMDISK</b>—Create superfast pseudo disk drive (eg. create a 90K RAM drive C: and still have 60K for BASIC on 256K PC). \$49.95</p> <p><b>INSIDE TRACK</b>—Over 60 PC utilities that compliment PEEKs 'n POKEs package. Too many functions to mention. \$44.95</p> |
|---|--|

**800-922-0786**

(NJ residents 201-879-5982)

**EDUCATIONAL MICRO SYSTEMS, INC.**

**PO Box 471, Chester, New Jersey 07930**



EMSI direct order terms: VISA, Mastercard, MO, check or COD. Add \$3.00 shipping/handling. Add \$1.90 for COD. Foreign or first class, add first class postage (package wt. 2½ lbs.). NJ residents add 6% sales tax.



# Tandy Unveils A Slimmer, Sleeker Laptop

## Tandyland

**Tandy's big news in June** was the introduction of its littlest computer, the Tandy 102—a thinner, lighter successor to the Model 100 laptop, which it replaces at Radio Shack Computer Centers. Functionally, the Tandy 102 is identical to the Model 100. It contains the same programs in its firmware and it is equally compatible with peripherals and third-party, plug-in ROMs.

One difference is a re-alignment of the function and arrow keys above the keyboard. Also, Tandy moved the system bus to the rear of the machine, instead of placing it in a covered slot on the bottom as it did with the Model 100. The Tandy 102 is also a pound lighter and a half-inch thinner than its predecessor (see Photos 1 and 2).

The new laptop retails for \$499; its minimum memory configuration is 24K. (If you're lucky, you might still be able to purchase a 24K Model 100 at its \$299 sale price.)

According to Tandy, the introduction of the new laptop reflects its commitment to provide the best-quality product at a competitive price. Though the move was expected as far back as last fall, sources at Fort Worth say manufacturing considerations made it more cost-effective to introduce the product in June.

Ed Juge, Tandy's director of marketing information, says the introduction is not a signal that Tandy is about to move into the MS-DOS laptop market. Though the company is watching that market closely, he says, it has no plans for involvement this year.

**Tandy's joint retail venture with** Great Britain's Applied Computer Techniques (ACT) met an early demise in January. The two companies officially dissolved the arrangement penned in January 1985 that was to establish a major European retail chain called AT Computerworld. ACT is the manufac-



Photo 1. Tandy's new laptop computer, the Tandy 102.

turer of the Apricot F-1, an entry-level MS-DOS system marketed in Europe.

Initially, the deal called for 70 AT Computerworld stores and 430 Tandy outlets to stock both ACT and Tandy computer products. By January 1986, however, only 29 shops were open. Weakness in the European microcomputer market (see the sidebar) might have been one reason for the venture's failure.

With the dissolution of the partnership, Tandy retains control of the company-owned stores, while ACT keeps the franchises. Of the 16 AT Computerworld outlets Tandy controlled in the venture, eight have already closed, two will become Tandy consumer-electronics stores, and six have uncertain futures. Tandy hopes

to recoup its investment by concentrating sales efforts on corporate customers and value-added resellers (VARs). ACT will attempt to recover its \$1.2 million loss by focusing primarily on its retail business.

**After an extensive** search for sponsors, Tandy and the CompuServe Information Service have chosen the Golden Triangle Corp. of Fort Worth to manage the Tandy special-interest groups (SIGs) on CompuServe. The appointment is expected to bring stability to the Tandy SIGs, which are some of the most active on the system.

Telecommunications enthusiasts who haven't explored the CompuServe SIGs ought to take advantage of this support network. You're likely to find help and advice that is unobtainable anywhere else, including at the place where you bought your computer. The TandyNet SIGs sponsored by Golden Triangle include the TRS-80 professional group (TRS80PRO), a Tandy laptop group (M100SIG), the Tandy Color Computer forum (COCO), and an OS-9 forum (OS9).

Once you log onto CompuServe, you can receive more information about TandyNet SIGs by typing GO TANDYNET at any system prompt (!). If you don't have a CompuServe account, you can find out what the SIGs are all about

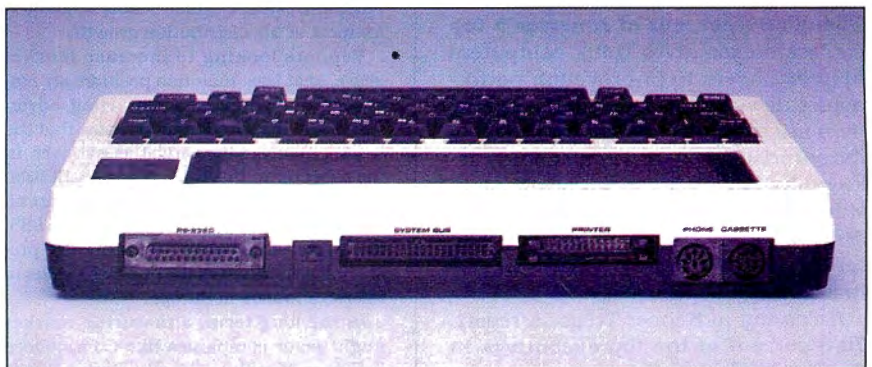


Photo 2. The new location of the system bus on the Tandy 102.

by writing to Golden Triangle Corp., P.O. Box 79074, Fort Worth, TX 76179.

**If you've noticed more spit and polish** in the appearance of the sales and management people at your local Radio Shack Computer Center (RSCC), there's a reason for it. In May, the company initiated a corporate dress code, mandated and drafted by Tandy's chairman, John Roach.

An article printed by the *Dallas Times Herald* in May quoted a Fort Worth RSCC manager as saying Roach was "totally disgusted" by the "slicked-back greasy hair, pimply faces, and thick, black horn-rimmed glasses" of some Radio Shack salespeople he encountered. He also criticized the characteristic attire of "checkered pants" and "corduroy jackets" with hundreds of pens stuffed in the pockets.

To rectify the sorry state of personnel appearance, Roach drafted a dress code that he hopes will promote a crisper look. Following are the dress requirements outlined in a memo from Ron Stegall, Tandy's vice president of business products:

- Dark or medium-colored suit (no sports coat) for men.
- Dark or medium-colored business outfit for women.
- Traditional business tie for men.
- White long-sleeve dress shirt for men.
- Color-coordinated, hard-sole dress shoes, always shined.
- Neatly trimmed and professional-appearing hairstyle.
- No facial hair without a valid medical reason.

Roach expects the company's new dress code to improve Tandy's image with the public and help the sales staff compete against IBM's salespeople, known for their traditional, conservative dress. The mandate, however, might grate on the nerves of RSCC personnel, who claim patrons are more concerned with service than they are with the staff's appearance. Nevertheless, a rule is a rule. As Ron Stegall said in the *Dallas Times Herald* article, "A beard or a mustache has never sold a computer."

## MicroTrends

**Though 64 percent of America's top corporate executives think computers help managers to improve job performance, fewer than half of those executives use computers themselves.** That's the surprising conclusion of a study released by Kepner-Tregoe, a business-research firm based in Princeton, NJ. The firm surveyed 821 chief executive officers and chief operating officers in Fortune 500 companies.

According to Kepner-Tregoe's report, 70.6 percent of the top executives in America's largest corporations do not have a computer terminal in their of-

fices. Of those who do, only 27 percent have the terminal within arm's reach. Though 52.2 percent of the executives said they never use a personal computer, 70 percent said they occasionally review printouts.

Just how close to the top does the PC influence get? Apparently, not very close. Only 21 percent of the members of America's top management teams use microcomputers 50 percent or more of the time. The most frequent application is financial analysis; the second most frequent is word processing.

The executives and managers who use computers say time savings and rapid data retrieval are the major benefits of the

technology. Nevertheless, when asked "What is the biggest threat posed by the computer for your business organization?", 12 percent of the executives cited excess or unnecessary data. Only 13 percent felt that computers pose no threat to their businesses.

As the report shows, personal computers have a long way to go before they are accepted in the boardrooms of America's Fortune 500 corporations. One route to the top might be through middle management, where computer use has become commonplace. As middle managers move up the corporate ladder, they probably will bring their computer savvy with them. ■

## European Micro Market Mirrors U.S. Trends

That the European microcomputer market shadows the U.S. market in growth is well known. Less known, or at least less publicized, is the fact that the European market mirrors the U.S. market in times of trouble, as well. In 1985, for example, the European microcomputer market grew 56 percent—a disappointing contrast to the robust 74 percent growth it recorded in 1984. The bottom line for some countries was even worse than the overall figure indicates. Markets in the United Kingdom and West Germany, for instance, grew only 31.6 percent and 43.6 percent, respectively.

Despite the depressing statistics for Europe as a whole, markets in a few of the smaller countries are still booming. The microcomputer markets in Spain, Denmark, and Switzerland, for example, grew over 80 percent in 1985 (see the Figure).

A key (growth) indicator in the European microcomputer market, especially in depressed years, is the number of new additions to manufacturers' distribution chains. Few independent dealerships were opened in 1985, and a significant number of stores were closed. Stores added to already established dealer chains accounted for most of the distribution growth.

Vendors looking to increase market share, or at least maintain position, are employing more traditional marketing, advertising, and distribution tactics now that the buying mania of the early 1980s is over. In the short term, this is likely to benefit IBM, whose dealer network and reputation are already well established in Europe. In 1985, IBM captured 33 percent of the market, preserving its position as the number 1 seller of microcomputers in Europe.

In the long term, a maturing market might favor companies like Commodore Business Machines, Tandy Corp., Victor

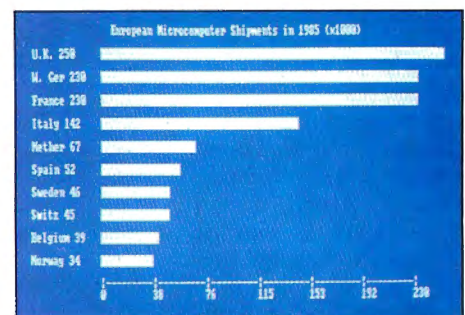


Figure. 1985 micro shipments in Europe.

Technologies, Zenith Data Systems, and Tandon Corp., which are building reputations on the strength of their IBM-compatible machines offered in the \$1,000–\$2,000 range. One clone maker that has already emerged as a force for IBM to reckon with is Olivetti. In 1985, Olivetti took 11 percent of the market—primarily on sales of its IBM-compatible M-24 computer—making it the number 2 seller of microcomputers. Ties with AT&T are also helping Olivetti develop inroads in the business community, many analysts believe.

Apple Computer retained its third-place position in the European market last year, mostly because of its reputation in education, with a 9.3 percent market share. The company has not developed a strong business following, however, and its Macintosh product competed poorly in 1985 against cheaper, more powerful MS-DOS clones. Finishing behind Apple with a 4.6 percent market share was Commodore, a surprise contender with strong sales of its PC-10 IBM compatible.

All the players, large and small, in the European microcomputer business will have to contend with a sluggish market through 1986. With growth in microcomputer sales not expected to exceed 35.1 percent, marketing and distribution strategies will prove more important to all manufacturers. ■

More Software from the Creators of Super Utility™

# TRSCROSS

**The SECOND Generation of Disk/File Transfer Utilities**

is here from PowerSoft!



## TRSCROSS™

Copyright 1986 by Breeze/QSD, Inc.  
All rights reserved

- 1 - Copy from TRS-80™ diskette
- 2 - Copy to TRS-80™ diskette
- 3 - Format TRS-80™ diskette
- 4 - Purge TRS-80™ diskette
- 5 - Display directory (PC or TRS-80™)
- 6 - Exit

Shown above is the Main Menu displayed when running TRSCROSS on your PC or compatible.

TRSCROSS runs on your PC, yet reads your TRS-80 diskettes! Copy files in either direction! • Written completely in-house by our programmers and 100% supported by PowerSoft •

TRSCROSS is as easy to use as it looks to be! The program is very straightforward, well thought out, and simple to operate. TRSCROSS has several "help" features built into the program to keep operation as easy as possible. Just pop in your TRS-80 disk to your PC and copy the files right to your PC data disk or hard disk. *It couldn't be any faster or easier!* Packed in the PowerSoft binder is a typeset instruction manual with Index. All steps are detailed. Advanced features, for those that desire to use them, include executing menu options right from DOS or from a .BAT file or macro. This can really speed up transfers when similar operations are performed frequently.

TRSCROSS allows you to "TAG" all files to be moved in ONE pass! Wildcards are supported to increase ease in copying only selected files.

Other features include converting BASIC programs or small SuperScript™ "files on-the-fly"! Forget about having to save your programs or files in ASCII first, or running a separate conversion program before transferring! TRSCROSS reads your tokenized BASIC SuperScript file program or SuperScript file directly off your TRS-80 disk and performs the conversion all in ONE pass while being transferred directly to your PC or compatible computer!. (Does not cover PEEKs, POKEs, graphics, or machine language calls or subroutines.)

**TRSCROSS will even FORMAT a TRS-80 disk right on your PC!**

(Handy for those who use both machines!) Former TRS-80 users who no longer have their TRS-80, but still have diskettes with valuable data. . .this is exactly what you've been waiting for! Similar in concept to our SuperCROSS, but runs on the PC rather than the TRS-80.

**TRSCROSS will READ FROM and COPY TO the following TRS-80 double-density formats: TRSDOS 1.2/1.3, TRSDOS 6.2\*, LDOS 5.1.4\*, DOSPLUS 3.5, NEWDOS/80\*\*, & MultiDOS\*.**

DOS formats listed above flagged with \* signify that earlier versions of these DOS's are readable as well, but one or more sectors may be skipped due to a format problem in that version of the DOS. One or more sectors may also be skipped on some NewDOS/80 formats. (Disks that were formatted with SUPER UTILITY + or SU4/4P do not, and have never had this problem.) TRSDOS 6.02.01, or higher should not have this problem. Disks formatted in any 80 track format, any single density or mixed density (Model I "boot" disks) are not supported.

TRSCROSS requires: PC or compatible computer, 128K and a normal 360KB (40 track drive) PC drive. Double-sided operation is fully supported, but NOT 80 track. If you have more than one disk drive, fixed drive, or RAM disk, operation will be much smoother. TANDY 1000 requires extra memory card because of the required DMA chip that resides there. TANDY 3000 is supported as long as you have a 360KB drive to use for transferring, rather than the hi-density drive. TANDY 2000 is not supported at this

time due to a difference in disk controller and floppy drives. TANDY 1200 is OK. Large SuperScript™ files (as well as other "special" data files like PROFILE +™) would need to be converted to ASCII on a TRS-80 first before they would be of any use on a PC or compatible.

*If you plan to retire your TRS-80, TRSCROSS is for you! TRSCROSS will allow access to your TRS-80 diskettes for years after your TRS-80 is gone!*

**TRSCROSS is now shipping! Place your order TODAY!**

only **\$89.95**

Available only from PowerSoft  
Plus \$3 s/h (U.S.) or \$5/Canadian or \$12/Foreign Airmail  
Texas Residents must add appropriate sales tax.

**POWERSOFT** Free! SOFTWARE CATALOG

Yes! Send me TRSCROSS™

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_

Chg. Card (circle one):  MasterCard  VISA Expires: \_\_\_\_\_

Card #: \_\_\_\_\_

Signature: \_\_\_\_\_

17060 Dallas Pkwy., Suite 114 • Dallas, TX 75248 • (214) 733-4475

**All products shipped from stock within 24 working hours.**

Got a hot tip you'd like to share with our readers? Send it to Reader Forum, c/o 80 Micro, 80 Pine St., Peterborough, NH 03458. We pay \$10 for each tip we use. Sorry, but we cannot return or acknowledge Reader Forum submissions.

**Keyboard PEEK**

PEEKing the Model 4 keyboard can aid in converting Model I/III programs to that computer. The Device (B) command from TRSDOS Ready can help.

You can access information from your keyboard and display drivers by getting their driver addresses. First, review pp. 1-79 through 1-82 in the *Model 4 Disk System Owner's Manual* to make sure you know how to use the Device command. You want to get the values for \*KI and \*DO, the keyboard-input and display-video-output devices, respectively.

By adding the appropriate values to \*KI and \*DO, you can find important locations.

\*KI + 12 begins the last key entered.

\*KI + 16 begins the scratch-pad keyboard image.

\*KI + 16 holds the bit patterns for @ABCDEFG, where bit zero represents @, bit 1 is A, and so on. \*KI + 17 holds the bit patterns for HIJKLMNO, \*KI + 18 holds them for PQRSTUUV, \*KI + 19 holds them for XYZ, \*KI + 20 holds them for 01234567' and (space)!\$%&', \*KI + 21 holds them for 89;+, -, ./, and \*KI + 22 holds them for the enter, clear, arrow, and space keys.

\*KI + 24 begins the image-control data for \*KI + 16. In bitwise order from \*KI + 24, the ASCII values for the following keys are stored: enter, shift-enter, clear, shift-clear,

break, shift-break, and all arrow and shifted arrow keys. You can reassign these keys to whatever values you wish or even disable a key by POKEing a zero value into it. For instance, POKE KI + 28,0, where KI is the \*KI address, disables the break key.

\*KI + 40 begins 6 consecutive bytes that hold the function-key values, in the order of F1, shift-F1, F2, shift-F2, F3, and shift-F3. You can alter these easily, as well.

\*DO + 12 is the scroll-protection value plus other video-control bits. Bits zero to 2 hold a value of zero to 7, indicating the number of lines to protect. Be sure to maintain the other bits set that might be in this location. To protect four lines, you could use:

POKE VIDDRV + 12,(PEEK

(VIDDRV + 12) AND &HF8) OR 4 where VIDDRV is the \*DO address.

\*DO + 13 holds the low-order value of the cursor position. \*DO + 14 holds the high-order value. To find the current cursor position, use: CURPOS = PEEK(DSPDRV + 13) + PEEK(DSPDRV + 14)\*256 - 63488 where DSPDRV is the \*DO address. This would be the same as POS(0) + ROW(0)\*80.

\*DO + 15 is the character currently under the cursor.

\*DO + 16 is the cursor character.

In all current Model 4 versions of TRSDOS, the internal flags table begins at address X'006A'. Some useful relative locations that you can derive from this follow.

FLAG + 10 holds the keyboard flags. Bit zero indicates

that the break key is pressed. Bit 1 indicates that shift-@ is pressed, bit 2 that the enter key is pressed, and bit 5 that the caps key is locked in. To check the break, enter, and shift-@ keys, POKE a zero into the appropriate location before testing.

FLAG + 18 contains system flags. Bit 3, if set to 1, indicates that the clock is running at 4 megahertz (MHz). If reset, the clock is running at 2 MHz.

FLAG + 19 holds the computer model number—useful to those using TRSDOS 6.x or LDOS 6.2 on various computers. A 2 is for the Model II, 4 for the Model 4, 5 for the Model 4P, and 12 for the Model 12.

FLAG + 21, bit 6, if set, indicates a solid cursor. Otherwise, it is blinking.

David Goben  
Story City, IA



**More GOTOS**

The GOTO command provides an efficient way to mechanize a sequence of case statements in Basic using colon-separated instructions following an If. . .Then statement.

Refer to the Program Listing. I inserted a colon after each Then and listed the statements to be executed on separate lines. This format reminds me that the program performs the statements only when the If statement is true. When the If statement is false, the sequence "falls through" to the next statement with a line number.

This technique does double-test the input for A\$, but the coding is readable once you become comfortable with the colon-separated statements.

Palmer O. Hanson Jr.  
Largo, FL

**Program Listing.**

```
100 INPUT A$
110 IF A$="Y" THEN
    :B$="Yes"
    :N=1
    :GOTO 140
120 IF A$="N"
    :B$="No"
    :N=2
    :GOTO 140
130 B$="Invalid Entry"
    :N=3
140 PRINT B$,N
150 GOTO 100
```

**Backspacing Blues**

I have often cursed myself while programming for backspacing in Basic's edit mode. Backspacing overlays the original line, but you can see what's underneath. All you do is enter the edit mode and use the space bar, rather than the L or X keys. Hold it down, and the code appears character by character. Then it will step the cursor to the left, and finally it will print the overlay characters.

A printer can do this faster. Mine prints the operational code and then a number of hourglass symbols corresponding to the number of backspaces. After that, it prints the overlay.

Henry H. Herrdegen  
Windsor, Ontario



# Advanced Word Processing Made Easy!

Circle 141 on Reader Service card.

POP QUIZ

## the *LeScript* *Sampler* package

**NOW** experience the beauty and ultimate performance of LeScript's full printing capabilities at just a fraction of the cost of the complete LeScript Word Processing System. If you have sent for your free LeScript Trial-Size Disk, then you already know how easy it is to create professional looking documents and merge names and addresses into **Form Letters** using LeScript. You already know about LeScript's **Dual Screen Editing**, **50-User Programmable Macro Keys**, and on-line **Tutorials** and **Help Screens**. You also know that LeScript has on-screen display of **Underline** and **Bold-face**, integrates with a **Spelling Checker**, and has a **Directory** function more powerful than your DOS.

**NOW** see how superb LeScript will make your documents look printed out on your own printer. The proportional spacing, the boldface, the underlining, the italics, the different font sizes will absolutely dazzle you!

**PLUS**, to add to the great value of this incredible offer, the LeScript Sampler package includes the complete **100-page LeScript Instruction Manual**, handsomely bound in an attractive cloth-covered 3-ring binder and slip case.

**AND** we will even let you apply the full purchase price of the LeScript Sampler toward the future purchase of the complete LeScript Word Processing System.

### 30-DAY MONEY-BACK GUARANTEE

Available for: IBM-PC/XT/AT/jr and compatibles,  
TANDY 1000/1200/2000/3000,  
TRS-80 Model 1, 2, 3, 4, 4P, 12, 16,  
TRS-80 Model 4/4P CP/M.

LeScript is available through  
Express Order at your local  
Radio Shack Computer Center

The complete LeScript Word Processing System is available for \$129.95 for TRS-80 1/3/4 versions, all other versions are \$199.95. A Free LeScript Demo Disk is available by calling (305) 259-9397. Demo disk does not allow printing or save-to-disk. The LeScript Sampler does not allow save-to-disk. Demo Disk carries a \$2.00 shipping and handling charge

YES! Rush me the LeScript Sampler Package. I understand that I can apply its cost toward the future purchase of the complete LeScript Word Processing System.

Send to: **LeScript, P.O. Box 361196, Melbourne, FL 32936**  
To order by Credit Card call **(305) 259-9397**

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Telephone# \_\_\_\_\_

My Computer is: \_\_\_\_\_  
VISA/MasterCard# \_\_\_\_\_

Exp. Date \_\_\_\_\_

\$49.95 + \$3.00 Shipping and Handling Florida residents add 5% tax. Add \$3.00 for C.O.D. Add \$5.00 for shipment outside the U.S.

Amount enclosed: \$ \_\_\_\_\_

ONLY  
**\$49.95**



# MONTEZUMA MICRO

WOW!  
ANOTHER  
NEW  
PRODUCT  
FROM  
MONTE

PRESENTS

## MONTE'S TOOLKIT \$49

REQUIRES: Montezuma Micro CP/M® 2.2 version 2.21+

Monte's Toolkit is a collection of utilities that will prove useful to every owner of Montezuma Micro CP/M (you all are owners, aren't you?). It's a disk full of programs that perform functions that are difficult, cumbersome or expensive to do any other way. Monte has tried, in his own way, to briefly explain each function for you below. Read on and be saved.

**DOUBLECROSS™** allows unlimited file transfers between CP/M®, IBM-DOS and Model 3/4 LDOS® /TRSDOS® with unsurpassed ease and speed. In fact, you can move just about anything from any disk to any other disk but you might have to make changes for program operation. Lotus 123® just flat won't run on your Model 3 and I doubt that you could ever modify Scripsit® enough to run on the IBM. Simple menus guide you through the operation with minimal keystrokes. Just tag the files you want in the directory display and go. You won't get doublecrossed with **DBLCROSS**.

**FREEFORM™** formats and backs up Model 3/4 LDOS/TRSDOS and IBM MS & PC-DOS (versions 1.x, 2.x and 3.x), both single side and double side plus there is a special "clone" copy when you just don't know or care what you have. Just insert a disk and copy away. All you have to know about the disk is how to get it into the drive. The Analysis feature lets you look at and print the actual structure of a disk - even the ones with "funny" formats.

**WSPR** lets you print to almost any printer using almost any control code. It's nearly magic and does a whole lot more than I can talk about here including letting you print *anything* your printer can print.

**FILEFIX™** gives you the ability to "fix" your "files" by adding linefeeds when your files are going from CP/M or IBM-DOS to LDOS/TRSDOS or take them away if you are transferring the other way. You can remove the control codes from a WordStar® document thereby converting it to a non-document file. The fix will also fix up Scripsit files so they can be used by CP/M and IBM-DOS based wordprocessors (you know - the real ones). All this is accomplished with the use of simple menus and boy, it is fast.

**SYS2M** requires 128K and our CP/M. The CCP and the BDOS are moved to drive M and the BIOS is modified to allow a Warm Boot from Drive M. So what you say. Well, you still have to have a disk in drive A but it no longer has to have the CP/M system resident. It can be anything. This little jewel copies frequently used programs to drive M and searches there first for all program requests resulting in much faster program loading. Slick isn't it?

**AUTO** is a little goodie that lets you issue multiple commands from the command line. Eliminates the *pain* of Submit. As in all the other parts of **MONTE'S TOOLBOX**, complete and comprehensive instructions are included and it's available right now.



# MONTEZUMA MICRO

PRESENTS

## MONTE'S WINDOW™



WINDOWS ON YOUR MODEL 4!



TAKES NO USER RAM!



**REQUIREMENTS**  
Montezuma Micro CP/M  
2.2 version 2.21+  
128K RAM  
Model 4 or 4P  
8 bit Printer



Pop Up Menus!

**\$49**

Easy to Use!



INDEX CARD FILE

A touch of the keyboard opens a window in your screen for a Note Pad, an Appointment Calendar, a Calculator, even a Mini Data Base. All yours for just \$49! Need RAM? Monte's Christmas gift to you - 64K and the window, both for \$99!

*Once Upon A Time,*

Monte Zuma, our Founder, President and King, has always had trouble keeping his desk organized. The Sidekick™ from Borland International would solve the problem, but alas, it was not available for CP/M®. So Monte asked his favorite nephew, the legendary LaMont E. Zuma (distant cousin to Rondo Talbot, a direct descendant of Monte Zuma himself) to work on the problem as best he could during recess at the home. LaMont, a true legend in his own time, really outdid himself this time. A touch of both shift keys halts your application program in its tracks and up pops **Monte's Window™** ready to use. What could be simpler? Put an end to the fumbling and pawing around the pile of papers on your desk. You will find **Monte's Window™** indispensable. When you are finished, break back to your application program and it resumes without error. **Monte's Window™** is truly a breakthrough. See for yourself - Look through **Monte's Window™** on your Model 4. How did you ever get along without it? See the page opposite for order information. **Monte's Window™** is available right now.



# MONTEZUMA MICRO

PRESENTS

## MONTE'S BASIC

Your TRSDOS BASIC (01.01.00) will work the same, for the most part, under CP/M as it does under TRSDOS. However, for the most part isn't good enough. But, with some changes provided by our **BASCON™** program, you can be 100% compatible with the standard BASIC used with CP/M. True, you lose some of the TRSDOS BASIC features while gaining new features such as FILES, NULL, RESET, etc. **BASCON** alters your TRSDOS BASIC, which was included with your Model 4 when you bought it, so that it will function under CP/M. You must have the unaltered original TRSDOS BASIC as above in order to convert with **BASCON**. The program operation is fully automatic and quick. The resulting BASIC runs any CP/M 2.2 BASIC program that previously required **MBASIC™**. Programs written for TRSDOS BASIC may require modification to run correctly under the converted BASIC. Fully compatible with **MBASIC**. We even provide for additional documentation that is keyed by page number to your TRSDOS BASIC manual. **MONTE'S BASIC** is available right now.

**\$49**

©Copyright 1985 by Montezuma Micro. All Rights Reserved.

# Can we talk? CP/M vs TRSDOS

By moving to CP/M on your Model 4 you achieve two things. First you open the door to a wealth of existing software. More 8-bit software runs under CP/M than any other operating system. This includes virtually all of the "big name" programs which have set the standards by which all others are measured. Programs like **WordStar**, **dBASE II**, and **Turbo Pascal** are available for CP/M, but not TRSDOS. Public domain software, almost unknown under TRSDOS, fills hundreds of megabytes of disk space. Valuable public domain programs like the **Small C Compiler** are just a toll-free phone call away. Most importantly, hundreds of applications programs are available from a multitude of vendors. Many include the source code. Wouldn't you like to be able to choose from scores of Accounts Receivable or General Ledger programs, instead of the meager selection you now have? Circle our special Reader Service number 600 on the Reader Service Card to receive our comprehensive free listing of suppliers of application programs that run under CP/M.

### What about the future?

When the time comes to move up to another computer it will almost certainly use MS-DOS. That's when CP/M users get a pleasant surprise. Since MS-DOS was a derivative of CP/M it operates in almost the same manner. Even better, most of the same software packages are available in 16-bit form and they operate in virtually the same way that they did under CP/M.

### Is it easy to use?

Montezuma Micro's CP/M has been carefully crafted to present a maximum of features while taking a minimum of memory. It supports all of the standard features of the Model 4/4P/4D computers, as well as most of the optional ones. Our CP/M has been consistently been awarded the highest ratings in industry magazines. It is version 2.2, the most popular and reliable of all the versions of CP/M produced. Our CP/M has been made as easy to use as possible. All customer-selected features are chosen from simple menus in our CONFIG utility. This includes the ability to configure a disk drive to run like that of scores of other CP/M com-

puters for maximum ease of software portability. Using the unique DBLCROSS program in our Monte's Toolkit utility package you can move files back and forth between CP/M, TRSDOS (1.3 and 6.x), and MS-DOS.

### Why use Montezuma CP/M?

We have already told you why our CP/M is the best for the Radio Shack Model 4 computer. The only question left to answer is "Why buy CP/M at all?" Radio Shack has abandoned TRSDOS — all of their new machines use MS-DOS. Most of the software producers have followed, leaving no new software development and saddling the TRSDOS user with whatever software "left-overs" he can find. Which DOS do you want to head into the future with: the one originally written for the Model I or the one that served as the basis for MS-DOS? Make the right choice right now for just \$169.

### If I need support?

We don't forget you after the sale. If you have a problem you will find our phones are answered by people, not answering machines or hold buttons. Our philosophy is very simple — we want you to be happy and satisfied with your purchase. If you have a problem then we have a problem, and we'll do whatever we can to resolve it.

### Cost to update?

Our owners are protected against instant obsolescence by our lifetime upgrade policy. At any time you can return your original CP/M disk to be upgraded to the latest version free of charge, except for a small shipping and handling fee. Periodically we publish **NEW STUFF**, a newsletter for registered users of Montezuma Micro CP/M. This publication carries news about new products, tips for getting more out of CP/M, and other valuable information for our users. It is sent free of charge to registered owners.

### Can I use a hard disk drive?

CP/M hard disk drivers are available for Radio Shack, Aerocomp, and most other popular brands of hard disk drives. These drivers allow the hard drive to be partitioned into one to four logical drives of varying sizes.

These drives may all be used by CP/M, or may be divided between CP/M and TRSDOS. A head-parking utility is included on the driver disk to minimize the risk of damage when the hard disk drive is not in use. Also included at no charge is a utility which will copy, compress, list, print, and delete files with ease. There isn't much you can say about a driver. It either works or it doesn't. Ours works supremely and it only costs \$30.

### Hard disk backup?

Unlike the high-priced, underpowered backup utilities available for backup of TRSDOS hard drives, our CP/M **HARDBACK** utility makes the backup of a hard disk to floppies quick and painless. Only **HARDBACK** gives you the choice of backing up the entire drive or only those files which it knows have been changed since the last backup. Daily backup is no longer a chore, since only new data must be copied. With **HARDBACK** you can quickly restore an entire drive, or only a single file if necessary. Only **HARDBACK** will perform a complete check of the hard disk drive and lock out tracks which have become flawed to prevent the use of those tracks for later data storage. Add this supreme program to your hard disk for just \$49. Isn't your time and data worth it?

### Specs?

**Size of Transient Program Area (TPA):** 56,070 bytes in a 64k system. 55,046 bytes in a 63k system (with optional hard disk driver). **CP/M IOBYTE:** Fully implemented. **Device Drivers:** Disk (35, 40, 77, & 80 track, single/double density single/double sided, 3, 5, or 8 inch. (More than 85 disk formats supported) **Maximum Disk Capacity:** 40T SS=220k, 40T DS=440k, 80T DS=880k **RS-232:** All word lengths, parity, & baud rates. **Parallel Printer:** With or without line-feed and/or formfeed. **Video:** 24 by 80 with reverse video. **Keyboard:** Full ASCII with 9 function keys. **RAM Disk:** 64k, automatic on 128k systems. **Hard Disk:** Optional drivers available at extra cost for most popular models. Standard CP/M programs included: **ASM, DDT, DUMP, ED, LOAD, MOVCPM, PIP, STAT, SUBMIT, SYSGEN, and XSUB.**

## Order Information

Give us a call now with your order and we will ship immediately. Prices include delivery to your door in the lower 48 States including APO/FPO. All others please add an amount commensurate to shipping requested. Any excess will be refunded. Credit cards will not be charged before we ship your order. The suitability of software selected is the responsibility of the purchaser as there are **NO REFUNDS ON SOFTWARE**. Defective software will be replaced upon its return, postpaid.

The toll-free lines are for orders only.  
Specifications/prices are subject to change without notice.

Montezuma CP/M: Model 4 version 2.30 ..... \$ 169

*The following items require Montezuma CP/M 2.2 version 2.20 or later.*

Optional Hard Disk Driver (specify exact hard drive) ..... \$ 30  
HARDBACK ..... \$ 49



**ORDER NOW ... TOLL-FREE**

**800-527-0347** U.S.A.

**800-442-1310** TEXAS

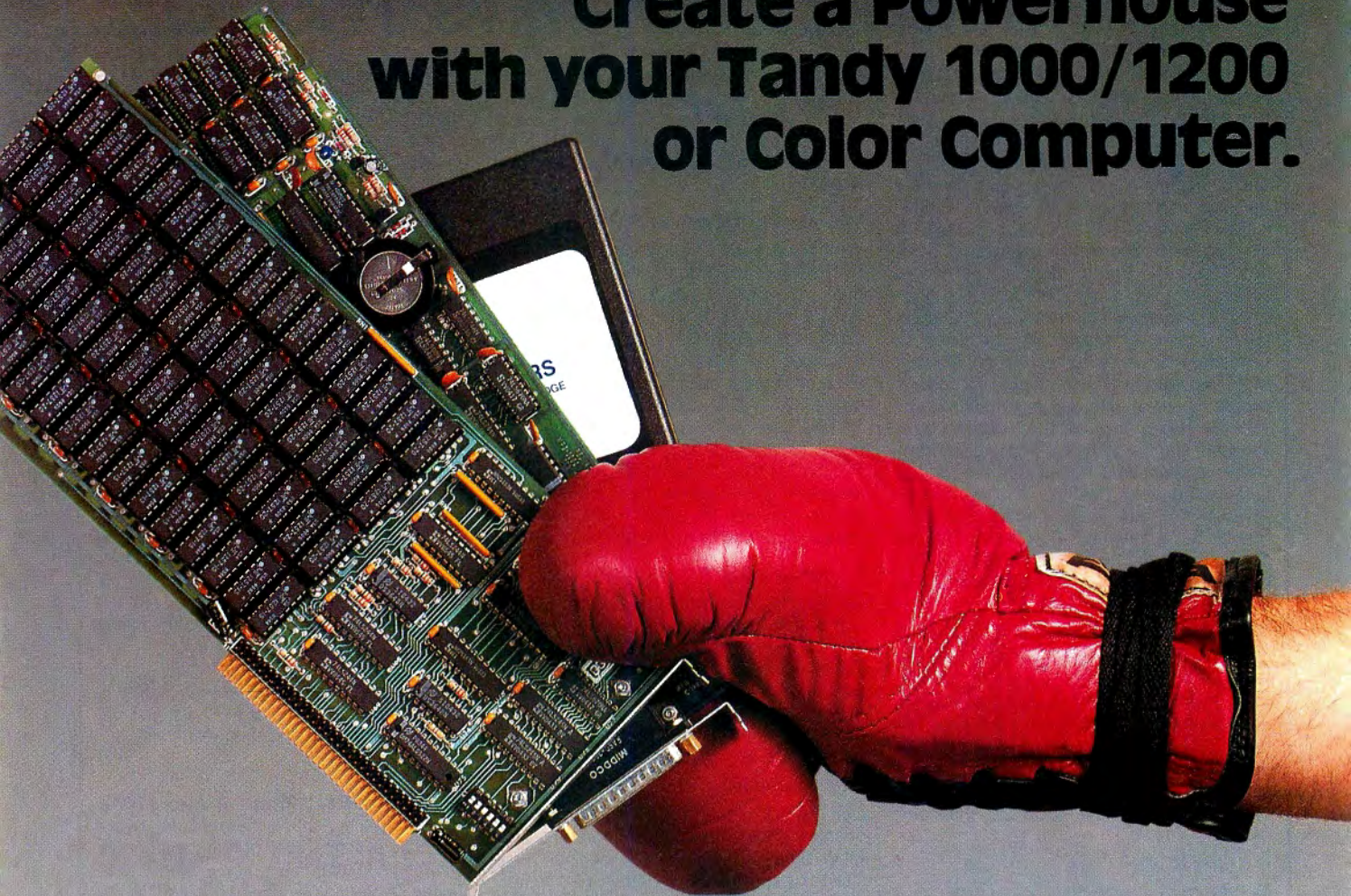


# MONTEZUMA MICRO

"We Keep You Running"

For Information:  
214-339-5104  
Redbird Airport, Hangar #18  
Post Office Box 763009  
Dallas, Texas 75376-3009 U.S.A.

# Create a Powerhouse with your Tandy 1000/1200 or Color Computer.



When you're ready to expand, look to the champion. PBJ boards have been setting industry records for years. Designed to enhance and increase your computer's capabilities, without putting the crunch on your wallet.

Add some extra punch to your Tandy with any of these PBJ expansion boards:

### **XRAM: Satisfies Memory Hungry Applications**

Our expanded memory board solves that only too familiar problem, "out of memory." XRAM breaks the 640K barrier imposed by DOS and adds up to 2 megabytes of memory to your system. Designed around the Intel/Lotus/Microsoft expanded memory specification, XRAM feels right at home with programs like Framework™ II, and 1-2-3® Release 2, Symphony® Release 1.1, Microsoft® Windows, and many others. In addition to the expanded memory DOS Driver, we also include a full diagnostic package and a versatile Ramdisk program.

(List \$299.95 w/256K)

### **MFB-1000: Solves Basic Needs**

Our multifunction board contains the three most needed functions on a single expansion card. The MFB-1000 contains up to 512K of Ram, a serial port for your modem, printer or mouse, and a battery

backed real time clock/calendar for your convenience. Provided with the board is a clock driver and a Ramdisk program.

(List \$299.95 w/128K)

### **Wordpak-RS: A Real Screen for the CoCo**

The newest version of the popular Wordpak, our 80 column video cartridge, goes hand-in-hand with the latest release of OS-9® for the Color Computer. The board is fully supported by software packages from both Radio Shack and third party vendors — a must for any serious application on the Color Computer.

(List \$99.95)

### **Bonus Software Coupons\***

With the purchase of XRAM or MFB-1000, we will include discount coupons worth hundreds of dollars. These coupons may be applied towards the purchase of some of the more popular software packages.

PBJ Boards are available at dealers nationwide and at your local Radio Shack store.



PBJ, Inc.  
503 East 40th Street, Paterson, NJ 07504, 201-523-8663

**Heavyweight performance at a knockout price.**

Radio Shack and Tandy are registered trademarks of Tandy Corporation.  
Microsoft and Windows are registered trademarks of Microsoft Corporation.  
1-2-3 and Symphony are registered trademarks of Lotus Development Corp.  
OS-9 is a registered trademark of Microware, Inc.

\*This offer may be discontinued without notice at the sole discretion of PBJ, Inc.

# The New Scripsit Makes All the Pieces Fit

by Terry Kepner

★★★★

**Scripsit Pro** runs on the Model 4 (128K) and requires two disk drives. Tandy/Radio Shack, One Tandy Center, Fort Worth, TX 76113. Catalog number 26-1601. \$249.95.

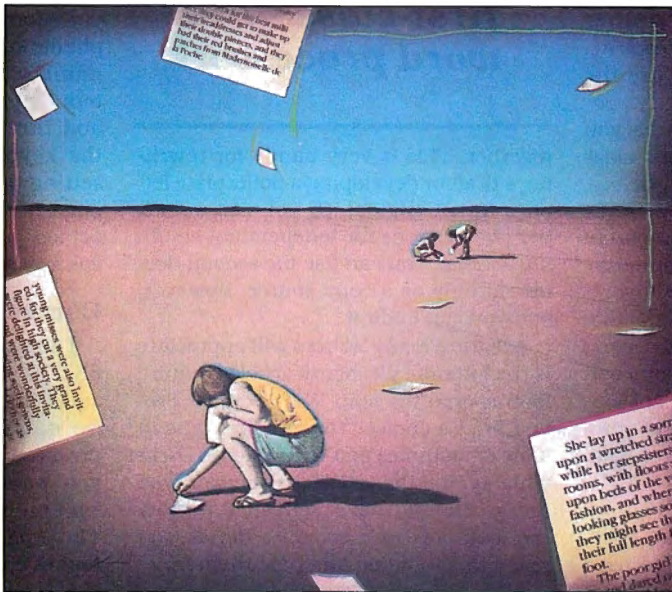
Tandy has finally got it right. I was surprised to discover that I liked Tandy's latest incarnation of its Scripsit word-processing program; Scripsit Pro lives up to its name. The original Scripsit was nice for beginners, but its poorly planned command structure, inadequate text formatting, and lack of printer support eliminated it from consideration by serious writers. SuperScripsit corrected many of these problems but was still inadequate for serious work. Its lack of footnoting, inability to chain files, and failure to merge with ASCII files from other programs hampered its performance.

Scripsit Pro, on the other hand, looks and feels like Tandy consulted professional writers in its design and implementation. In addition to correcting the aforementioned SuperScripsit problems, Scripsit Pro includes a 6K help file, a spelling checker, and the ability to load a second document in a window for comparison (and you can copy data from that file into the first).

Unfortunately, there were some trade-offs for these improvements. The most important one is that you must have a Model 4 with 128K of memory. Scripsit Pro aborts loading as soon as it discovers you have only a 64K machine.

## Starting Statistics

Like SuperScripsit, Scripsit Pro begins every document with an opening menu that lists the document's name, author, operator, a comment line, printer type, the number of lines printed per page, the character pitch used, the first page numbers for headers and footers, and the widow line on/off status. (This last item prevents the last line of a paragraph



from being the first line of the next page; instead it moves the paragraph's last two lines to the next page.)

When you're finished with this menu, Scripsit Pro loads the entire document into memory. You have room for either 32,768 characters or 256 pages in your document. Exceeding the limits gives you an error message that tells you to save the document as a chained file and to proceed to the next file.

When you enter the text buffer, only 22 lines of text are displayed; the bottom two are reserved for the tab and the status lines. The tab line is a line of dashes interspaced with numbers marking every 10th column position. Left and right parentheses indicate left and right margins, respectively. Plus signs indicate tabs. The status line gives the document name, the page and line numbers of the current cursor location, the cursor posi-

tion in inches from the left margin, pitch, line spacing, and the percentage of free space left. It is also a prompt area for control commands with secondary options.

Text appears on the screen the way it will on paper. Since both paper and screen are 80 columns wide, this works nicely. Centered lines on paper are also centered on the screen. Similarly, left and right margins, indentations, and other spacing parameters are displayed on the screen. It's not quite a "what you see is what you get" word processor, but it's as close as the Model 4 will ever get.

The arrow keys control cursor movement, with the lateral movement by the character, word, paragraph, page, or video page. The shifted arrow keys move the cursor to the beginning and end of the document and the left and right margins. You can also move to a specific line or page number.

If you have old files that you want to use with Scripsit Pro, you must first save them in ASCII. You can then open a new file in Scripsit Pro and import the old file into the program.

## The Heart of the Matter

Like Scripsit, Scripsit Pro leaves you in over-type mode unless you specify otherwise. To change it, just press the F1 key. This doesn't toggle an insert mode as you might expect. Instead, it inserts a line of 80 blank spaces. Should you reach the end of a video line before reaching the end of the spaces, it inserts another line of blanks. When you are finished inserting, pressing the break key closes the gap.

I tried to force Scripsit Pro to miss characters during this insert-new-line-while-typing procedure (the bane of Scripsit) by filling memory and then inserting several lines of type at the beginning. Not once did it miss a character. Character deleting is equally simple: Press the F2 key. Pressing F3 and then the appropriate key deletes a word, line, sentence, paragraph, or page. All other

### The Star Ratings

80 Micro's star ratings reflect our reviewer's impression of a product.

The stars mean:

- ★★★★★ Superior
- ★★★★ Excellent
- ★★★ Good
- ★★ Fair
- ★ Poor

control commands are two- and three-keystroke combinations.

Scripsit Pro uses several methods of invoking different commands. For example, to move the cursor to the previous paragraph you press the up-arrow (or the left-arrow) key and the G key simultaneously. To move it to the next paragraph, simultaneously press the down-arrow (or right-arrow) key and the G key. Most of Scripsit Pro's other commands (such as invoking a block action or centering a paragraph) use the control key.

Scripsit Pro has all the commands you would expect to find in any first-class word processor. You can copy, delete, move, print, and file blocks of text; freeze them so that operations such as search/replace functions, margin adjustments, line-spacing changes, and so forth won't affect them; read text files from disk into your current document or load a second file into the screen window and copy text from it to your original file (but not vice versa); define and total a column of numbers; and perform a global search-and-replace operation.

Scripsit Pro gives you some advanced commands for manipulating the document. You can view the disk directory, copy the current document to another name on the disk, rename the current file, and erase the current file. You can also toggle the display of tabs, paragraph markers, and printer codes and change all or part of the document's line spacing.

The word processor has a variety of save commands. You can cancel all changes made since the last save, save the file and return to the main menu, save the file and return to DOS, and save the file and go to either the previous document in the chain series or the next file in the series. But I didn't like Scripsit Pro's requirement that you must save a document to disk before exiting it.

Scripsit Pro has 10 user-defined keys that can store up to 127 keystrokes each. You can chain these keys one after the other.

A caveat in regard to block copies and moves: Scripsit Pro creates a special disk-control file when you copy a block into the copy buffer. This file contains the material copied. When you retrieve material from the copy buffer, for a move or copy operation, it is being read from disk. In other words, if you are tight on disk space, you could get an "out of disk space" error message.

The windowing feature is interesting. When invoked, it divides the screen in half. Your original document is in the top half and the other document is in the lower half. If you're editing a document, you can load a previous version and lock the versions into step so that they scroll

## ***Scripsit Pro has all the commands you expect to find in any first-class word processor.***

together. This is very handy for rewriting a draft or developing a boilerplate letter from an original. Or you can unlock the two versions for independent scrolling actions. You can use the second document only as a copy source, however, and you can't edit it.

A feature many writers will appreciate is the footnote file. Many articles require footnotes in the text. With Scripsit Pro, you have a choice: You can first type in a file of footnotes and then refer to them while typing the article, or you can type the article and have Scripsit Pro write the footnotes to a separate file as you reach their citation and type them in.

With the program's window feature, you could have a footnote library and copy the appropriate one from the library to your document's footnote file. However, the footnotes must be in sequential order (removing a reference to a footnote without removing the footnote will throw the sequence out of order when printing), individual footnotes cannot exceed two pages in length, and the line count in the status line will be incorrect (the program doesn't look at the footnote file to see how many lines the footnotes use on each page).

### **Printer Power**

How well a word processor formats text is as important as how it edits it. Scripsit Pro lets you boldface, underline, strike-through, double-underline, and use superscripts and subscripts on printers with those options. In addition, you can insert text while printing, insert the current date, force top of form, and pause during printing (to give you a chance to swap disks while printing documents longer than a disk). Scripsit Pro provides 19 user-definable printer keys so you can access any printer features not normally supported by the program.

Scripsit Pro includes 23 different printer drivers: Courier, Elite, Gume, DMP120, DMP430, DW2B, DMP200, DMP500, DWP210, LP4, DMP400, DMP105, DMP2100, DWP410, LP8, DMP110, DMP420, DMP130, DW2, DWP510, DMP2200, DMP220, and a plain-vanilla driver

called Printer. Amazingly, the documentation includes instructions on how to write your own driver (including specifications for some of the subroutines used), and you can access the drivers themselves as text files with Scripsit Pro.

Outside of the physical support features, Scripsit Pro lets you use multi-line page headers and footers on all or just even- or odd-numbered pages; it provides form-letter document merging, hyphenation, insertion of the current page number in text, printing special characters (left and right braces and brackets and the tilde, for example) input from the keyboard, pausing between pages, setting the page length and the starting page number, selecting the number of copies printed, and setting the printer column in which to begin printing.

### **Corrections**

The spelling checker supplied has a 53,000-word vocabulary, and you can add 1,300 words of your own to customize it. Using it is sinfully simple: Just press control-S while in the document you want checked. If the spelling check isn't on line, you're prompted to load it. The program scans your documents and makes a list of unknown words (and provides a count of the total number of words in your file); it then reloads your document and shows you these words in the context of your document. You can skip the word, correct it, or add it to your dictionary. When you complete the operation, you're already back in your original file ready to save the corrected version to disk.

### **Conclusion**

Scripsit Pro's documentation was written by David Lien's company, CompuSoft. It is superlative. Everything is clearly explained and thoroughly indexed. This is the best manual I have ever seen from Tandy.

The manual is divided into four major sections. The first is for people who merely want an electronic letter writer. The second builds on that, teaching basic word-processing techniques. The third is for the advanced student, while the last is for the professional who wants to squeeze every last feature out of his printer.

After years of dealing with the inadequacies of Scripsit and SuperScripsit, Tandy has finally put it all together. Scripsit Pro isn't perfect, but then I've never seen a program that was. However, it is far superior to its two predecessors. If you use Allwrite, Lazy Writer, or LeScript, I don't suggest switching. But if you have Scripsit or a comparable program and want to upgrade, take a good hard look at Scripsit Pro before buying anything else. ■

# POWER TOOLS

## C Compiler

Alcor C is a full implementation of the C language. It includes a standard function library and a 450 page manual. The manual contains a 130 page tutorial so you won't have to buy any other books to learn the language. You also get our programmable full screen editor. It's everything you need to become a productive C programmer.

*"a serious, comprehensive implementation"*  
*"superlative work, I recommend it highly"*

**Creative Computing Nov. 85**

*"the most comprehensive manual"*

*"the professionalism presented is very apparent"*

*"we would not hesitate to use it in a large programming effort"*

### Features Include

|          |         |                   |
|----------|---------|-------------------|
| char     | 8 bits  | initializers      |
| short    | 8 bits  | typedef           |
| int      | 16 bits | static            |
| unsigned | 16 bits | auto              |
| long     | 32 bits | extern            |
| float    | 32 bits | struct/bit fields |
| double   | 64 bits | union             |

**Computer Language Feb. 85**

Execution speed on the Model 3 for 10 iterations of the prime number program published in Byte, Jan 83, page 284.

|             |           |
|-------------|-----------|
| LC Compiler | 105 secs. |
| Alcor C     | 78 secs.  |

## Multi-Basic Compiler

Alcor Multi-Basic is a powerful and versatile BASIC compiler. While remaining compatible with both MS-BASIC™ and CBASIC™ programs, it extends the BASIC language to include features normally found only in Pascal or C. Now you can take advantage of features like multi-line functions, recursion, and dynamic memory allocation without having to switch to another language. Multi-Basic has the features you need to improve the way you program. You can get rid of line numbers and actually write programs that other people can read. Multi-Basic is the most portable version of Basic you can buy. You can write a program on the TRS-80 Model 4 and then move it with no changes to the Tandy 1000. Multi-Basic also includes our programmable full screen editor.

*"the most comprehensive BASIC"*  
*"the manual is thorough and well organized"*  
*"the compiler is fast and efficient"*  
*"did exceptionally well on the benchmarks"*

**Computer Language May 85**

*"a superior compiler"*

*"Anybody who wants to compile existing programs or write BASIC programs in a Pascal-like fashion should consider Multi-Basic a must purchase"*

**80 Micro Nov. 85**

Execution speed on the Model 3 for 10 iterations of the prime number program published in Byte, Jan 83, page 286.

|                   |            |
|-------------------|------------|
| BASIC Interpreter | 4570 secs. |
| Multi-Basic       | 89 secs.   |

## New Low Price: Only \$69.95 Your Choice

|                               |          |                           |                               |          |
|-------------------------------|----------|---------------------------|-------------------------------|----------|
| Alcor C Compiler              | \$69.95  | Name _____                | Alcor Multi-Basic             | \$69.95  |
| In Texas add \$4.28 sales tax | _____    | Street _____              | In Texas add \$4.28 sales tax | _____    |
| Add shipping                  | _____    | City _____                | Add shipping                  | _____    |
| (\$5 USA/\$25 Foreign)        |          | State _____ Zip _____     | (\$5 USA/\$25 Foreign)        |          |
| Total                         | \$ _____ | Country _____ Phone _____ | Total                         | \$ _____ |

Check One:

- Model I TRSDOS   
 Model III TRSDOS  Works with LDOS,  
 NEWDOS, DOSplus, Multi-DOS



### Method of Payment

- MC  Visa  Money Order  Check   
 Card # \_\_\_\_\_ Exp. \_\_\_\_\_

Multi-Basic is a trademark of Alcor Systems.  
 TRS-80 is a registered trademark of Tandy Corp.  
 MS-Basic/MSDOS are trademarks of MicroSoft  
 CBASIC/CP/M are trademarks of Digital Research  
 LC is a trademark of Misisys

Check One:

- Model I TRSDOS   
 Model III TRSDOS   
 Model 4 TRSDOS   
 Model 4 Montezuma CP/M   
 Model 4 Radio Shack CP/M   
 Tandy 1000/1200 MSDOS   
 Tandy 2000 MSDOS

TRSDOS version also works with LDOS, NEWDOS, DOSPLUS and MULTIDOS

## Combination Windows

by Bobby Ballard

★★★★

**Window Weaver** runs on the Models 1000/1200/3000 (256K) and requires one disk drive. Integrated Micro Technology, P.O. Box 698, Station J, Calgary, Alberta T2A 4X8, 403-293-5972. \$49.99.

Windows here, windows there. Windows are everywhere, except possibly in the programs that you are writing. Wouldn't it be nice to just call a function and have a window magically appear?

Window Weaver is a fast machine-language utility for creating and manipulating text windows. It's easy to call from a number of languages and has good Basic support. Window Weaver works with IBM's BasicA 2.x interpreter, Microsoft's Basic Compiler 1.x, GW-Basic and Quick Basic, and Summit Software's Better Basic.

### Clear Windows

I put the Window Weaver through its paces with Tandy's GW-Basic and it's a real charmer. It's fast and easy to use. Your first step when writing an interpreted program is to load Window Weaver into a segment of RAM. The minimum amount of RAM allowed is 256K, and I suspect that you need more for a Tandy 1000. (I used a 1000 with 640K on board.)

The 33-page manual contains a chart with load addresses for various system configurations to help you determine the load address to use on your system. The syntax for loading Window Weaver into GW-Basic uses the BLOAD command, which follows a DEF SEG for setting the memory segment for loading the utility. The following code loads Window Weaver into a 256K configuration:

```
10 DEF SEG=&H38A0
20 WN%=0:BLOAD "WW.BIN",WN%
```

Once you have Window Weaver installed, the only thing left is to learn the parameters required to make the call. To use it, you invoke Basic's Call command followed by nine variables telling Window Weaver where to put the window, the window type, and action to take on any active window. The variables passed to Window Weaver must always be integers and must always fall within the allowable range for each function.

The following command will call Window Weaver into action from GW-Basic:

```
30 CALL WN%(ULR%, ULC%, LRR%, LRC%, S%, N%, A%, SN%)
```

where you have previously defined the variables to allowable values. The first parameter is used for GW-Basic as the offset address to use in the call. Other languages might not need this value.

The next four parameters tell Window Weaver where to place the new window. ULR% is for the upper-left row while ULC% is for the upper-left column, and so on. LRR% and LRC% must both be higher than ULR% and ULC%.

The next function, S%, controls the actual function you wish to invoke. There are 13 functions, including clearing, scrolling up and down, scrolling left and right, and various save functions. The N% parameter tells Window Weaver the number of lines to scroll when used with one of the scroll functions under S%.

This is followed by the A% parameter, which is the attribute of the lines cleared if S% is a clear-type function. The attribute represents the 16 screen colors. The final parameter in the series, the screen number SN%, is used to keep track of the different windows.

If you use a Basic compiler like Quick Basic, then changing your code is easy. Just change all the Call statements to Call Absolute statements. Then you link the Window Weaver just as you would any other external file.

### Documentation

The Window Weaver comes on an unprotected disk that you can easily back up or install on a hard disk. The disk contains several programs and files, including sample programs that have already been compiled using Window Weaver, a version specifically for Better Basic users, and the object files to use in linking Window Weaver with compiler object codes. There are also sample BasicA program listings to load and run with your interpreter. These files work well with GW-Basic.

The spiral-bound, typeset manual provides Basic program listings, installation instructions for floppies and hard drives, complete operation instructions, and a collection of useful appendices, one of which covers Quick Basic interfacing in detail.

### Conclusion

If you'd like to add windows to your programs, take a look at Window Weaver. GW-Basic and Turbo Pascal both support windows, but they are slow and don't pop onto the screen like Window Weaver. It takes some time to get used to its syntax, but it's a breeze once you get the hang of it. This package has a lot going for it: It's not copy protected, has no royalty restrictions, is priced fairly at \$49.99, is easy to learn and use, and interfaces easily with many languages. ■

## No More Mousing Around

by Mare-Anne Jarvela

★★★★

**The LX200 Trackball** works with the Models 1000/1200/2000/3000. It comes with a power supply, cable, and disk. Disc Instruments, 102 E. Baker St., Costa Mesa, CA 92626, 714-979-5300. \$139.

★★★

**The L-PC Lite-Pen** works with the Models 1000/1200/3000. Lite-Pen Company, P.O. Box 45255, Los Angeles, CA 90045, 213-305-7616. Color monitor pen \$179.95 (color plus mono pen \$199.95).

Using a mouse as an input device is a pretty good idea, but who has enough desk space for the little critter? My desk is crowded enough without having to plot out an area just for a rodent. But there are alternatives, such as a trackball or a light pen, which serve the same purpose but don't take up as much desk space.

### On Track

A trackball is an upside-down mouse; it has the rolling ball on the top, not on the bottom. With the LX200, you use the palm of your hand to roll the ball around, instead of moving a mouse all over your desk. You need only a small space next to the computer for the trackball. It hooks up easily to the serial port on the Model 1000 with a gender-changer cable.

The LX200 Trackball emulates the Microsoft mouse. This means that most software that supports the Microsoft mouse will run with the trackball. One exception is MS Windows from Microsoft, but Disc Instruments is working on a fix for this.

The two buttons on the Microsoft Mouse have been replaced by three on the trackball. The left button is the enter key, the middle is the escape key, and the right button functions as a "drag" initiator. The drag function works the same as when you hold a button down on the mouse and roll it around. On the trackball you press first the right button and then either of the other two buttons to get into drag mode. To release the trackball back to the click mode, press any of the three buttons.

I tried the trackball with PC Paintbrush, a standard PC paint program. I replaced the Mouse.COM file that came with the program with the trackball's Mouse.COM driver. I found it much easier to control the cursor with the trackball than with the mouse. The buttons are easy to get used to and simple to operate. The drag



option, for instance, lets you draw without pressing a button, and you can move the cursor quickly and accurately.

### Light Me Up

While the Model 1000 has a light-pen port, it isn't much good if no one sells a light pen. Tandy doesn't sell one and there wasn't one for the 1000 until the Lite-Pen appeared. The L-PC Lite-Pen hooks up nicely to the 1000's light-pen connector. If you have a computer without the light-pen connector (the Model 1200 or 3000), the Lite-Pen company supplies the two cables needed.

To use the pen, you touch its tip to the screen and then press on the screen until the tip retracts into the pen. The pen is made of stainless steel and measures 7½ inches long by ½ inch in diameter.

The software includes the Lite-Pen driver, a mouse emulator, and several sample programs. The checkout option lets you calibrate the pen for correct readings, and the samples let you see the different areas for which you can use the pen. The music program shows how you enter notes with the Lite-Pen. The game option includes two solitaire card games, reversi, and backgammon. L-PC Sketch is a Lite-Pen-controlled drawing program. The menu also includes a text-editing program, a computer-education program, a keyboard tutor, an order-entry program, and a map program that lets you take a closer look at a particular area of the world.

The manual also has a section on how to write your own Basic programs for the Lite-Pen.

The Lite-Pen Company supplies a list of software that includes light-pen drivers: PC Draw by Micrografx, Sargon III by Hayden, MS Windows by Microsoft, IMSI Designer by IMSI, Spoc by Cypress Software, and Prodesign II by American Small Business Computers Inc.

I used the pen with PC Paintbrush using the mouse-emulator option and with DR Halo II 2.03 using the light-pen driver included with the Lite-Pen software. The pen is easy to use but my hand got tired after a while. I'm not sure if it was tired from the weight of the pen (1.5 ounces) or the way you have to push the tip against the screen.

### Conclusion

Some industries predicted a couple of years ago that computer mice would gain universal acceptance. It hasn't worked out that way, however. These two devices correct some of the deficiencies of using a mouse, such as wasted desk space and lack of control over input. While the ultimate input device still isn't with us, the light pen and the trackball are viable alternatives. ■

## Comparing Notes On C Compilers

by Gary A. Shade

★★★★

**Let's C** runs on the Models 1000/1200/2000/3000 (256K) and requires one disk drive. Mark Williams Company, 1430 W. Wrightwood Ave., Chicago, IL 60614, 800-692-1700. Express Order Software number 90-0419. \$75.

★★★

**Eco-C** runs on the Models 1000/1200/3000 (256K) and requires one disk drive. Ecosoft Inc., 6413 N. College, Indianapolis, IN 46220. 317-255-6476. \$59.95

There are so many low-cost C compilers available today that it is difficult to ascertain which would be best for a beginner. Benchmarks that test a compiler's speed can be useful in evaluating them, but to paraphrase a famous quote, "There are lies, damned lies, and benchmarks." It is better to use benchmarks only as one of several factors in deciding which compiler to buy.

These two compilers, Let's C and Eco-C, both have many different features. Each can be installed on and run from a hard-disk system, and neither is copy protected. While they both provide efficient and fast code, it's in the extras that you will find their differences.

### Benchmarks

I adapted the benchmarks (see the Table) from a pair of articles in *Byte* magazine: "Benchmarking Unix Systems," by David F. Hinnant (August 1984), and "Comparing C Compilers for CP/M-86," by Jerry Houston, Jim Broderick, and Les Kent (August 1985). In all, I used four benchmarks in comparing the two compilers.

Each benchmark was compiled, linked, and executed five times. I then averaged these times for execution and compilation speed.

While the compilation times for the Mark Williams compiler are significantly

longer than for Eco-C, the executable code produced by Let's C is nearly half that produced by Eco-C. The Sieve of Eratosthenes benchmark has become a *de facto* standard in benchmarking systems, CPUs, and compilers. Let's C executed the Sieve benchmark in an average 8.2 seconds compared with 13.28 seconds for Eco-C.

The loop benchmark performed 10,000 iterations of a do-nothing loop. The timings slightly favored the Mark Williams compiler by .36 seconds, but Eco-C produced less machine code and compiled significantly faster.

The Fibonacci benchmark is a good test for compiler efficiency and recursive operations. It calculates the 24th value in the Fibonacci sequence (where each successive number is the sum of the two most recent numbers). Here, Eco-C came out on top with an execution time of 48.6 seconds compared to 59.38 seconds for Let's C. The code produced by Eco-C was also significantly shorter than that produced by Let's C.

The floating benchmark executes 140,000 floating-point operations. As there wasn't an 8087 math coprocessor present, the results indicate how well the floating-point software executes for each compiler.

As can be seen, Let's C executes the floating-point benchmark some 3.5 times faster than does the code produced by Eco-C. Although Eco-C produces a smaller object module and compiles faster, the difference in execution speed is considerable.

One noteworthy compiler difference is that Eco-C automatically checks for the presence of an 8087 math coprocessor. If one is present, Eco-C uses it in processing the floating-point calculation. Since the compiler must sense the presence (or absence) of the 8087, Eco-C pays a penalty in execution speed when the chip isn't present.

In contrast, Let's C doesn't generate code in support of the 8087 math processor, while The C Programming System, from which it was adapted, does support it. This is a serious omission for a product of this caliber.

| Benchmark | Execution time in seconds |        | Code size in kilobytes |       | Compilation time in seconds |       |
|-----------|---------------------------|--------|------------------------|-------|-----------------------------|-------|
|           | Let's C                   | Eco-C  | Let's C                | Eco-C | Let's C                     | Eco-C |
| Sieve     | 8.20                      | 13.28  | 4,855                  | 9,308 | 48.10                       | 30.39 |
| Loop      | 2.24                      | 2.60   | 4,778                  | 1,062 | 45.84                       | 26.40 |
| Fibonacci | 59.38                     | 48.60  | 4,837                  | 1,058 | 46.67                       | 27.74 |
| Floating  | 117.40                    | 420.19 | 6,251                  | 3,154 | 47.30                       | 32.47 |

Table. Comparative benchmark results for Let's C and Eco-C. Times are averaged over five executions or compilations.

SAVE 48% RIGHT NOW!

**"I have found something in almost every issue that has been worth the price of the subscription. I am amazed at the broad spectrum of the technical articles you publish, with ample material for both novice and advanced programmer."**

Roger L. Holstege...MD



And with 6 to 12 new programs for your Tandy computer in every issue, you too will find something each month that's worth the low cost of your subscription! Just type them in, and they're yours. Spreadsheets, word processors, all kinds of home, business and personal applications, plus helpful utilities that make all your programs easier to write, debug and use.

### VALUABLE HARDWARE PROJECTS

Want more value? How about *80 Micro's* money saving **hardware projects** you build yourself... or our frequent **patches and enhancements** that make commercial software programs even better.

### PROGRAMMING TECHNIQUES & TUTORIALS

You'll add to the value of your computer and get more out of every hour you spend computing with expert guidance from *80 Micro's* **programming techniques** that help you streamline and improve programs. In addition, *80 Micro's* step-by-step **tutorials** keep you ahead of today's fast-moving technologies like nothing else.

### HARDWARE & SOFTWARE REVIEWS

Avoid even one chancey hardware purchase, and you've saved enough to repay years of *80 Micro* subscriptions! You'll save yourself a bunch of time and hassle, too, with *80 Micro* checking out new software for you. Zero in on programs and products you want and skip the clunkers.

### THE MOST WIDELY READ MAGAZINE IN ITS FIELD

*80 Micro* is the most widely read magazine serving Tandy users today, with the largest editorial staff in its field. It's the oldest and most authoritative, too, so you know you can trust the help and advice you find in every issue.

### START SAVING NOW WITH 48% OFF THE COVER PRICE!

Yes it's true. You don't even have to wait for your first issue to start saving with *80 Micro*! Just use the coupon below or return the postpaid card opposite and you'll start receiving *80 Micro* every month at a full 48% off the Newsstand Rate. *If you're ever dissatisfied, for any reason, you'll be reimbursed for all un-delivered issues. Guaranteed!* So do it now. And get *80 Micro's* value working for you, every month from now on!

\* TRS-80 is a trademark of Radio Shack, a division of Tandy Corp.

**YES, I want to add the value of *80 Micro* every issue.** Enter my no-risk subscription for 12 monthly issues at the Introductory Rate of just \$24.97! I save a full 48% off the newsstand price!

Payment enclosed     Bill me

Name (Please Print) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Canada and Mexico, \$27.97, Foreign surface \$44.97, 1 year only. Foreign airmail, \$79.97. US funds drawn on US bank. Please allow 6-8 weeks for delivery.

369B8

**80 Micro • Box 981 • Farmingdale, NY 11737**

► For even quicker service, **CALL TOLL FREE 1-800-258-5473** (in NH, dial 1-924-9471) and charge it to your credit card!

## Supplies

Like all C compilers, Let's C includes several utilities derived from Unix: wc counts the number of lines, words, and characters in a file; egrep searches for a character string within a file; and cmp does a byte-by-byte comparison of two files.

The handiest utility shipped with Let's C is MicroEMACS, a full-screen editor, which is a terrific bonus. You can use the program to write programs or compose letters.

Mark Williams supplies an assembler and linker with its compiler. Eco-C also contains its own assembler but requires Microsoft's macroassembler MASM when interfacing Assembly-language routines to C.

Eco-C uses Link.EXE, the MS-DOS linker that links the compiler's object code and produces executable machine code. Let's C contains its own linker (ld), which can't link MS-DOS-format modules. Unfortunately, Let's C doesn't generate object modules compatible with the MS-DOS linker. (The more advanced C Programming System compiler does support both Mark Williams- and MS-DOS-format object files.) This could be a problem if you have efficient Assembly-language routines that you want to use within your C programs. Here, Eco-C has an advantage over the Let's C package.

## Memories and Libraries

Both compilers support only the small memory model: All code must reside within 64K and data is likewise restricted to 64K. Eco-C, however, provides a method for working around this limitation by including a function (farcall) in its library.

While both compilers have function libraries, Eco-C has the better set. Eco-C includes MS-DOS routines and BIOS routines specific to the IBM PC/XT in addition to the standard Unix-like I/O library. The Eco-C package also contains many standard functions for memory management that let you work around the 64K limit of the small memory model.

Let's C also has a Unix-like standard I/O library and includes many MS-DOS-type extensions (i.e., date and time functions), although they are fewer in number than those supplied with Eco-C.

## Options

Ecosoft sells the C source code for its library for \$10 and the ISAM (indexed sequential-access method) file handler in object form for \$15. Ecosoft also has two books on C published by Que Corp.. Jack Purdum is the president of Ecosoft and the author of the *C Programming Guide* (\$19.95) and coauthor of the *C Programmer's Library* (\$21.95, \$124.95 with disk), which details the ISAM file handler.

Mark Williams has an optional software package called CSD, a source-level debugger worth every penny of the \$75 price tag. The package allows the programmer to debug a C-language program at the source level rather than at the machine level.

A programmer can trace any C-language statement or qualify an expression and halt execution on any statement. This is an affordable productivity tool for the home-computer user. But there is one catch: CSD works only with programs compiled by Let's C and the C Programming System.

## Conclusion

Eco-C's documentation is very disappointing when compared to the documentation in the Let's C package. Eco-C's documentation consists of a 92-page stapled manual with no index, making it difficult to find a function description within the manual. Neither set of documentation can be considered a tutorial on the C language.

The Mark Williams Let's C documentation is first class and contains a 270-page manual describing the compiler, assembler, and linker. The manual contains a good description of each function and includes an index. The manual also contains another 61 pages describing MicroEMACS plus another separate index for the screen editor.

Benchmarks are not the sole criteria by which to choose your compiler. What the Mark Williams compiler lacks in MS-DOS-specific library functions, it makes up for in other ways, such as the auxiliary programs supplied, the ability to upgrade to the larger C Programming System, its ease of use and documentation, and the availability of a source-level debugger. Let's C comes out on top of the Ecosoft compiler by a wide margin. And the execution times in the benchmark tests I performed were also generally faster than those of Eco-C.

The strong points in favor of Eco-C are its ability to produce 8087 code if the chip is present in the system and to sense for one at run time, the availability of the library source code, the optional ISAM object code and book (*The C Programmer's Library*), and generally smaller executable file sizes and faster compilation times.

Evaluate your needs before deciding on any C compiler. Consider the type of programming you're going to do. If you never plan to write large, involved programs, Eco-C might be what you are looking for. However, if in the future you plan to write sophisticated programs that require more than the 64K limit, consider purchasing Let's C, which can be upgraded to the more advanced C Programming System. ■

## Addressing Issues

by Wynne Keller

★★★

**The Name and Address System** runs on the Models 1000/1200/3000 (256K) and requires one disk drive. Indian Ridge Enterprises Inc., 508 Second St., Dept. 80, Oakland, CA 94607, 415-268-1435. \$29.95.

A name-and-address filing system is just a data-base program without the flexibility. In my opinion, it is a poor trade-off. Not only is your name-and-address filing cast into a mold that might not fit your needs, but it is unusable for any other purpose. While the Name and Address System (NAD) is inexpensive, it has serious shortcomings. The savings in initial price might be a poor investment for the long haul.

NAD comes with a paperback-book-style manual, printed on a dot-matrix printer and reduced to 6- by 8-inch page size. The print quality is marginally acceptable. The contents are reasonably good, but an index would be helpful. There appears to be text missing between pp. 65 and 66.

The disk is not copy protected. Support is available only on a fee basis: \$5 for five minutes; \$1 per minute thereafter. You are encouraged to back up your program disk. If you fail to do so and damage the disk, you won't be able to obtain a replacement disk from the company. You must buy the program again.

An important consideration for any filing job is capacity. Inexplicably, NAD's manual does not deal with this topic at all. You are left to guess whether your intended mailing list will fit on a disk. Since NAD does not span disks, this is an important omission. In testing the program using an 80-character reference field, I found that about 1,400 names and addresses will fit on one floppy disk.

NAD has a serious weakness in file layout: There is only one name field, which means both last and first names must go in the same field. It is therefore impossible to obtain normal last-name, first-name sorted order unless you type the names in last name first. The drawback to this is the appearance of the labels, which will also print last name first—a generally unacceptable format.

## Adding and Editing

As you enter the program, you must type the date, since NAD doesn't use the system date. All program choices are selected by number from a menu. Each time you enter a choice, you must spec-

*Continued on p. 113*

# THE WONDERFUL WORLD OF **TANDY 1000** **ADD-ONS**



Not all MS-DOS hardware add-ons

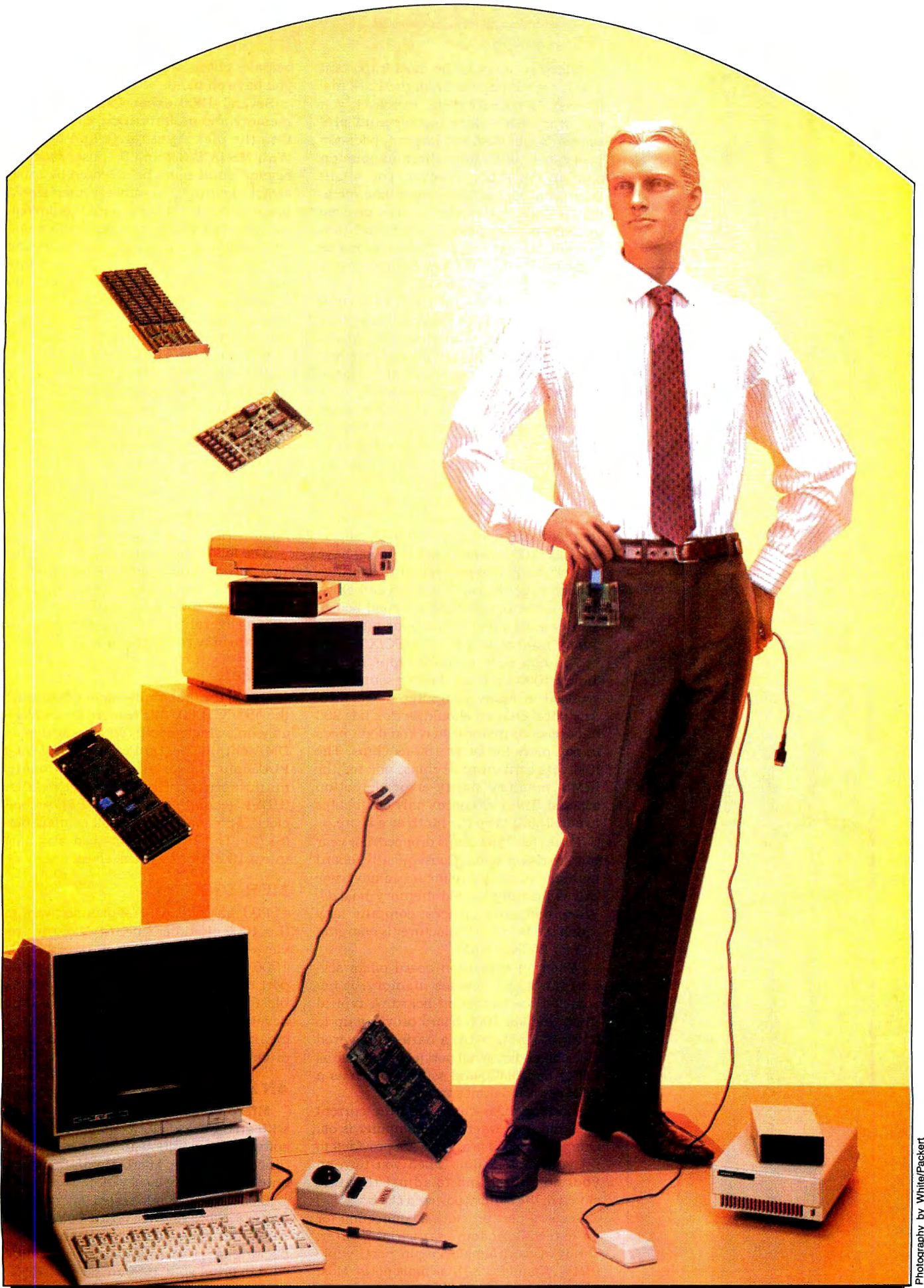
are Tandy 1000 compatible.

**O** We tell you what works and what doesn't work.

One of the rewards of owning a Tandy 1000 is that you can choose from the stacks of software written for the IBM PC. Unfortunately, 1000-compatibility stops at software. Buy an IBM memory multifunction board that will fit in the 1000 (shorter than 10½ inches) or one of those on-sale-cheap PC hard drives and you're out of luck. The 1000 has just enough hardware quirks to keep them from working.

It's not just that some types of hardware don't work in the 1000—serial ports, modems, and clocks usually work fine—it's that you have only three short slots to work with. Fortunately, enough manufacturers have smelled the market for 1000-specific hardware that you now have real choices in upgrading your 1000. A whole range of 1000-compatible memory and multifunction boards designed to make good use of those three slots is available. Many hard-drive suppliers have also noticed Tandy's booming clone sales and have converted their products to the 1000.

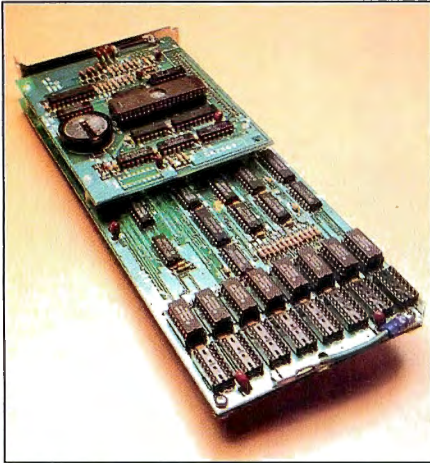
*80 Micro* has reviewed much and tested most of the hardware available for the 1000. (Refer to the Product Index elsewhere in this article for a list of what we've covered here.) We have the information you need to upgrade your micro effectively and cheaply, not only with multifunction boards and hard drives, but modems, mice, speedup boards, light pens, and more. Whether you're shooting for a power machine with megabytes (MB) of RAM, multiple input/output (I/O) ports, and a hard drive, or just shopping for a little extra memory and a modem, you're in the right place.



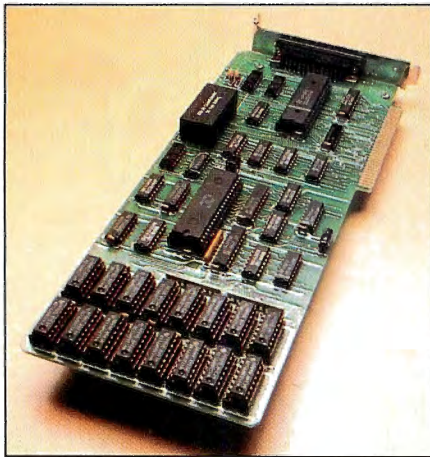
Photography by White/Packert

# Multifunction Boards

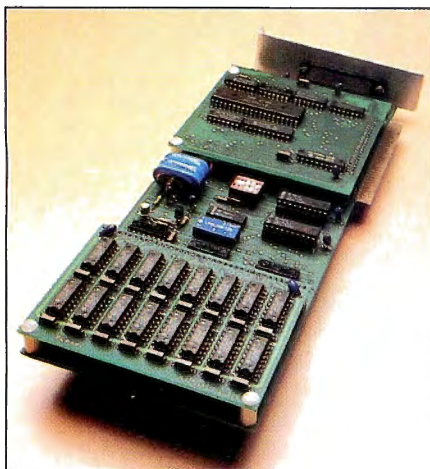
by Dave Rowell



Tandy's Memory PLUS.



ATD's Zuckerboard MFB.



Matthew's Master/Card.

Added memory is the most important 1000 upgrade (especially for the 128K machines). As your RAM size increases, you can work with more background programs, bigger files, and larger application programs. With only three expansion slots in the 1000, however, you might need a board that offers more than memory: a clock, serial port, mouse, or even another printer port. Chances are that you'll find what you need at a reasonable price among the 1000-compatible boards described in Tables 1 and 2.

Memory boards for the 128K 1000 must provide a DMA (direct memory access) chip. DMA, standard with IBMs and their clones, speeds up disk access and some other processes that move large blocks of memory. More importantly, it increases IBM compatibility because some software copy-protection schemes require DMA, as do certain hardware add-ons like hard drives. Bringing your 128K Tandy to 256K also increases Basic's program area from 21K to the maximum 60K.

You can use some expansion boards that have an optional (or no) DMA chip as a second 1000 memory board. If you have an old Tandy memory board that brings you up to 256K, you'll have to add chips to 384K before installing a second board. You can also use these boards in the Tandy 1200 or an IBM PC or PC/XT.

You can buy memory chips for the Tandy 1000 from third-party sources advertised in many computer magazines. Any 256K chip set should work if it is 200 nanoseconds (ns) or faster. You don't need to pay more for faster 150-ns chips. The IBM sets contain nine chips, one for the IBM's memory parity-error detection scheme. The 1000 needs only eight chips to add 256K; keep the ninth as a spare.

Prices for 256K chips dropped last year but are rising again. Consequently, board manufacturers are reluctant to advertise prices for fully loaded memory boards. When comparing prices, compute how much the board manufacturer is charging you for 256K of RAM.

When an expansion board offers several functions besides memory, it becomes a multifunction board. A typical multifunction 1000 board provides up to 512K of RAM, DMA, a battery-powered clock/calendar, serial port (configurable as COM1 or COM2), and software such as a RAM drive and print spooler.

Clock/calendar chips store the current date and time when your computer is off. One or two clock programs are provided to set your system time when you turn on your computer and to adjust the time stored in the battery-powered clock.

A serial port provides a connection for an external modem or a serial printer. Tandy uses a female 25-pin port, while IBM's PC and PC/XT has male ports. Most 1000 boards come with female ports. To

be safe, check what kind of serial cable you have on hand.

Several 1000 expansion boards (both memory and multifunction) can take you into the megabyte range and beyond. With MS-DOS 2.x and 3.x, user memory beyond 640K must be accessed by bank-switching through a software interface. At present, the use of banked RAM is limited. All boards with more than 640K come with a RAM-disk program that can use the RAM above 640K. RAM disks mimic floppy drives but store files in RAM instead of on a disk. A RAM disk is faster than a floppy drive but evaporates when you turn your computer off.

Most megabyte boards also offer an expanded memory manager (EMM) driver that follows the latest Lotus/Intel/Microsoft expanded memory specification (LIM EMS 3.2B) for bank-switching above 640K. Recent versions of large spreadsheet programs like Lotus 1-2-3 can use expanded memory. More software will be using LIM EMS or a superset of this standard sponsored by AST, Quadram, and Ashton-Tate (AQA/EMS).

The following summaries of multifunction and memory boards supply information or comments not found in the Tables. We've tried most in our 1000s but have listed several we haven't used because they are only recently available.

## TanPak

One of the first multifunction boards for the Tandy 1000, this bruiser fits comfortably on a single board (\$80 less without a DMA chip). The TanPak accepts Tandy PLUS plug-ins or attachments from its manufacturer, Hard Drive Specialist (HDS): second serial port (\$85), second clock (\$85), or a serial/clock combination (\$170). The HDS plug-ins can also plug into a 1000 slot by themselves.

## MFB-1000

PBJ has added RAM-disk software to this 1000 old-timer since *80 Micro* first reviewed it. The MFB-1000 is one of the only 1000 expansion boards with a male serial-port connector, so it requires an IBM cable. PBJ packed a lot on a small board and developed a reputation for good service by clearing up early problems with hard-drive compatibility.

## 4N1, All-N-1

Micro Mainframe's 4N1 now comes with an on-board clock/calendar chip and software, in addition to the usual multifunction goodies. Micro Mainframe guarantees its RAM chips for life.

*80 Micro* has not tested Micro Mainframe's All-N-1. This board comes with 512K and gives you the option of piggy-backing Micro Mainframe's new memory card to bring your 1000 to 2.6MB of RAM, using only one slot. The card uses an EMS

# MISOSYS, Inc.

We have professional software products for your Tandy Computer

**Now toll-free telephone ordering available. 800-MISOSYS**

**ON SALE**

## LITTLE BROTHER DATA MANAGER

"... a lot of versatility in such an inexpensive program." *Hardin Brothers, 80 MICRO, Sept. 1985.*

- Menu driven for ease of use
- 65534 records, 1024 characters per record
- 64 fields/record, 1-254 chars/field
- Definable input screens
- Definable print formats
- TRSDOS™ 6 or MS-DOS™ (T1000, T1200)

**Complete LB** ..... **74<sup>95</sup>**  
 (Regular \$99) + \$3 S&H

**ON SALE**

## LITTLE BROTHER MAINTENANCE UTILITY

- Generate a new data file set from existing LB data.
- Add new fields or delete old fields.
- Perform special field type conversions.
- Re-chain deleted records in a Little Brother data file.

**LBMU-M4 or LBMU-MS** ..... **29<sup>95</sup>**  
 + \$2 S&H

**NEW**

## Enhanced BASIC Compiler

- Includes CED: a full featured line editor
- Supports LOGO-like turtle graphics: DRAW, ROT, & SCALE
- Supports an "X" file mode which extends random access record lengths to 32767 bytes!
- Supports in-line assembler code via: Z80-MODE/HIGH-MODE
- Multi-line functions; fast keyed/tagged sort; REPEAT-UNTIL; IF-THEN-ELSE; labeled statements; much more!

**ENHCOMP (For Model III)—PRO-ENHCOMP (For Model 4) either version** ..... **124<sup>95</sup>**  
 + \$3 S&H

**ON SALE**

## THE SOURCE

**While they last—only a few hundred sets left**

The complete, commented assembler source code for TRSDOS™ 6.2.0 excluding hard disk support, BASIC, and HELP.

- Volume 1—The System: 302 pages
- Volume 2—The Libraries: 486 pages
- Volume 3—The Utilities: 358 pages

**The three volume set:** ..... **99<sup>95</sup>**  
 (Regular \$249) + \$5 S&H

**NEW LOW PRICE**

## LDOS™ 5.1.4

LDOS™ is the Model III DOS most compatible with your TRSDOS™ 6. To run Model III software on your Mod 4, make your selection.

- LDOS™ 5.1.4 disk plus Quick Reference Card . . . . . \$19.95 + \$2 S&H
- LDOS™ 5.1.4 disk + QRC plus smallDOS user handbook . . . . . \$29.95 + \$3 S&H
- The complete LDOS™ system: 5.1.4 disk plus 400 page manual...binder e/w tabs \$5.00 extra . . . . . \$49.95 + \$5 S&H  
 (Previously \$69)

Note: Model I systems available on request

**NEW**

## Mister ED Application Pac

- DED—full screen edit a disk
- FED—full screen edit a file sector
- MED—full screen edit a RAM page
- TED—full screen edit a text file
- VED—edit the video screen
- CARDFORM—populate CARD with a form
- DOLOAD—loads DOSAVED files
- REGENBU—shrinks BRINGUP/DAT file

**Mister ED** ..... **59<sup>95</sup>**  
 (Requires PRO-NT0) + \$3 S&H

**NEW**

## Model I, III, and 4 Language Power!

- PRO-MC—Our FULL K&R C compiler with nearly 200 functions compatible with UNIX™ System V. Wildcards, I/O redirection, args, overlay support. Requires PRO-MRAS or M80 . . . \$124.95 + \$4 S&H
- PRO-MRAS—Powerful Relocating macro Assembler Development System. /REL module compatible with Microsoft! Includes full screen text editor, librarian, VM linker . . . . . \$74.95 + \$3 S&H
- PRO-CREATE The "standard" macro assembler used by professionals and novices alike. Full screen editor; cross-reference; more. . . . . \$74.95 + \$3 S&H
- PRO-HartFORTH—A full 1979 STANDARD FORTH compiler; runs under TRSDOS 6. Floating point! Access DOS files! Editor! Graphics! . . . . . \$74.95 + \$3 S&H

Note: Model I/III products available on request

MSDOS is a trademark of Microsoft Corp.  
 TRSDOS and TRS-80 are trademarks of the Tandy Corp.  
 UNIX is a trademark of Bell Telephone Laboratories

**POP QUIZ**

**MISOSYS, Inc.**

PO Box 239  
 Sterling, VA 22170-0239  
 703-450-4181 MC, VISA, CHOICE  
 800-MISOSYS 1P-5P EST Mon-Fri  
 Orders Only! Circle 107 on Reader Service card.

driver to access memory over 640K. Micro Mainframe also offers a Small Computer System Interface (SCSI) card and an eight-computer network card that fit onto the All-N-1. The SCSI interface can be used with several laser printers, hard drives, and networks.

Micro Mainframe also offers a stand-alone *plug-in* version of the 2MB card.

### Memory PLUS

This is the board that Tandy puts in the 1000HD. You can use it to bring your 128K 1000 to 384K or 640K, but the Memory PLUS is not as flexible or inexpensive as others. It's a memory board that accepts one plug-on option, either a serial port or a clock/mouse board, but not both. PLUS options come with new support brackets to make the appropriate port available at the rear of your 1000. This is the only board we've seen backed with RFI (radio-frequency interference) shielding.

### Zuckerboard MFB

ATD's 512K MFB is a low-price Zuckerboard with all options included and a serial port. Like the original, the configuration jumpers are labeled so you don't have to read the instructions to set them; the serial-port jumpers are marked COM1 and COM2. The instructions are good—short

and to the point. The board is 1000 specific with a Tandy-style-card support bracket and nonremovable DMA chip. *80 Micro* tested (but did not review) the board, and it performed satisfactorily.

### Master/Card (MEGaboard)

The Master/Card (formerly Matthew Electronic's MEGaboard) was the first 1000 board to go beyond 640K. It can add 512K or 1MB to 128K and 384K systems (DMA is a removable plug-on sandwich). Automation Facilities Corp. now markets Matthew's products. The board has two sandwiches, one for DMA and the other for the second 512K of RAM, but fits easily between other expansion boards.

The Master/Card has its own system of bank-switching (not EMS) and comes with a RAM disk to use memory beyond 640K. A section of the manual details use of the bank-switching software for programmers. An EMS driver is being developed. The big advantage of the Master/Card and its bank-switching software is that the contents of the RAM disk survive a reboot.

While *80 Micro* has not reviewed this board, we have given it several months of hard use and it has survived. Matthew Electronics has plans for more memory expansion (up to 32MB) in conjunction with its expansion chassis for the 1000.

### Full House

SJS says that the Full House will bring your 1000 to its full memory (640K) and I/O capabilities for only \$315. SJS sells the only 1000 multifunction board that gives you two serial ports and two more printer ports. Full House is two boards: the I/O board with ports (\$170) and the memory board (\$165 with 512K). You can install them separately or assembled (\$315), taking only one slot. We haven't tested the product yet.

### Multiboard

Another promising multifunction board we haven't tested yet, PCA Technology's Multiboard adds 2MB to your system, mediated with an LIM-standard EMS driver. It also includes a DMA, clock/calendar, RAM disk, printer spooler, and serial port. One easy-to-use setup program allocates RAM for a RAM disk, print spooler, and EMS. Setup values are then stored on the board using the battery.

### PG Design Electronic's 2.5MB MFB

Not yet available from this manufacturer of Model 100 upgrades, this 2.5MB multifunction board sounds good on paper: LIM/EMS support, DMA, serial port, clock/calendar, RAM disk, and print spooler. ■

| Product/<br>manufacturer                                  | RAM (K)<br>(min./max.) | EMS<br>**          | DMA<br>(configurable) | Serial<br>port      | Clock/<br>calendar                          | Software<br>bundled  | Warranty<br>(p&l)*        | Price<br>(min. RAM) | Price<br>(max. RAM)     | <i>80 Micro</i><br>reviewed |
|---|------------------------|--------------------|-----------------------|---------------------|---|--|---------------------------|---------------------|-------------------------|-----------------------------|
| 2.5 MB MFB<br>PG Design Electronics                       | 512/2,560              | yes                | yes(yes)              | female(yes)         | yes   | RAM disk<br>print spooler  | six months<br>30 days MBG | n/a                 | n/a                     | none                        |
| 4N1<br>Micro Mainframe                                    | 0/512                  | no                 | yes(no)               | female(yes)         | yes   | RAM disk<br>print spooler<br>communications<br>program, other<br>utilities | one year                  | \$199.95            | \$259.95                | 1/86, p. 36                 |
| All-N-1<br>Micro Mainframe                                | 512/2,560              | yes<br>with > 640K | yes(yes)              | female(yes)         | yes   | as with 4N1<br>above   | one year                  | \$349.95            | \$930                   | none                        |
| Full House ***<br>SJS Engineering                         | 0/512                  | no                 | yes(no)               | two ports           | yes   | no   | 90 days                   | \$170               | \$315                   | none                        |
| Master/Card (MEGaboard)<br>Automation Facilities<br>Corp. | 512/1,024              | no<br>yes(yes)     | female(yes)           | yes                 | RAM disk<br>print<br>spooler<br>memory test | 90 days  | \$395                     | \$555               | coming up               |                             |
| Memory PLUS<br>Tandy Corp.                                | 256/512                | no                 | yes(no)               | option<br>(\$99.95) | clock/mouse<br>option<br>(\$99.95)          | no   | 90 days                   | \$179.95            | \$309.90<br>(w/RAM kit) | 1/86, p. 36                 |
| MFB-1000<br>PBJ Inc.                                      | 128/512                | no                 | yes(yes)              | male(yes)           | yes   | RAM disk   | one year                  | \$299.95            | \$359.95                | 1/86, p. 36                 |
| Multiboard<br>PCA Technology                              | 256/2,048              | yes                | yes(yes)              | male(yes)           | yes   | RAM disk<br>print spooler  | two years                 | \$299.99            | \$499.99                | none                        |
| TanPak<br>Hard Drive Specialist                           | 0/512                  | no                 | yes(yes)              | female(yes)#        | yes#  | RAM disk<br>print spooler  | one year                  | \$329               | n/a                     | 1/86, p. 36                 |
| Zuckerboard MFB<br>ATD                                    | 512                    | no                 | yes(no)               | female(yes)         | yes<br>(20-year<br>battery)                 | RAM disk<br>print spooler  | two years                 | —                   | \$249                   | none                        |

\*\*\*comes with 2 parallel ports, RAM and I/O ports on a separate board that can be combined as one

\*\*Expanded Memory Specification (Lotus/Intel/Microsoft)

# takes plug-on 2nd clock, 2nd serial port, or serial/clock combo (\$85, \$85, \$170) or Tandy PLUS boards

\*parts & labor MBG is money-back guarantee

Table 1. Multifunction board vital statistics.



# Memory Boards

by Dave Rowell

## XRAM

XRAM, PBJ's multimegabyte memory board, can be used in any PC clone because it doesn't have a DMA chip (although our test board has a 1000-type support bracket). It uses LIM EMS 3.2 to bank-switch up to 2MB above 640K. XRAM holds all of the 2MB on a single board but has no extras. There is a piggy-back plug that can hold a second 2MB XRAM or some other function card in the future. The XRAM system is designed to work with up to three more sibling boards (8MB total) in two slots.

PBJ provides an extensive diagnostic program that not only does several types of expanded memory tests but also views expanded memory and performs EMS functions—sort of a Debug for expanded memory. We tested the RAM disk (2MB) with the Doran test of drive performance and it ran 25 percent slower than a PC/XT hard drive, but much faster than a floppy.

## Zuckerboard Expansion Memory

One of the cheapest ways to add RAM to your Tandy 1000, ATD's Zuckerboard comes with DMA but no serial port. A clock/calendar chip and RAM-disk and print-spooler software are options. The Zuckerboard comes with simple instructions and is easily installed. The one jumper can go either on the 384K pins or the 640K pins, both clearly labeled. If the two-year warranty isn't long enough, you can purchase a five-year warranty.

## Maxit

The 8088 microprocessor can address 1MB of memory. MS-DOS reserves ad-

resses between 640K and 1MB for itself but doesn't actually use much of that address space. Maxit, from McGraw-Hill CCIG Software, steals those unused addresses for some of its own 256K of RAM. Maxit software can either load your memory-resident programs in the stolen area above 640K, or use its RAM following the LIM expanded memory specification. The card works in the 1000, but its support bracket has to be trimmed or removed.

## Turner Hall Card

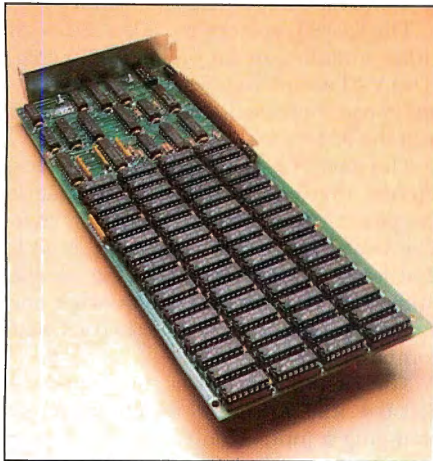
The Turner Hall Card supplies 256K of RAM, a clock/calendar, a RAM-disk program, and a print spooler. Because it is very short and has no serial port, the plug-in card needs no support bracket. If you have the older Tandy memory board that brings you to 384K, the Turner Hall Card will top you off at 640K with a clock and RAM disk for \$99.95. It has no DMA, and it works only if you already have 384K.

## Memory Only

HDS's Memory Only board is just that: nothing but 512K with a DMA chip. It includes no software, but the price is right. Memory Only accepts Tandy PLUS and HDS plug-ins (see TanPak above). 80 Micro has not yet used this board.

## Micro Mainframe MS5150 2MB Memory Board

This is a stand-alone version of Micro Mainframe's All-N-1 2MB add-on card. It comes with the EMS driver, RAM disk, print spooler, and a memory test that maps around any bad memory. If some RAM is bad, you can still use the board. We haven't tested this product. ■



PBJ's XRAM memory board.

| Product/<br>manufacturer               | RAM (K)<br>(min./max.) | EMS<br>** | DMA<br>(configurable) | Serial<br>port | Clock/<br>calendar | Software<br>bundled                                   | Warranty<br>(p&l)*      | Price<br>(min. RAM) | Price<br>(max. RAM) | 80 Micro<br>reviewed |
|--|------------------------|-----------|-----------------------|----------------|--------------------|---|-------------------------|---------------------|---------------------|----------------------|
| Maxit<br>McGraw-Hill                   | 256                    | yes       | no                    | no             | no                 | special driver  | one year<br>30 days MBG | \$195               | —                   | 8/86, p. 108         |
| Memory Only<br>Hard Drive Specialist   | 512                    | no        | yes(no)               | no#            | no#                | no  | one year                | —                   | \$195               | none                 |
| MS5150 2MB Board<br>Micro Mainframe    | 256/2,048<br>##        | yes       | no                    | no             | no                 | RAM disk<br>print spooler<br>memory test              | one year                | \$299.95            | \$579.95            | none                 |
| Turner Hall Card<br>Turner Hall Publ.  | 256                    | no        | no                    | no             | yes                | print spooler<br>RAM disk                             | one year<br>30 days MBG | \$99.95             | —                   | 8/86, p. 108         |
| XRAM<br>PBJ Inc.                       | 256/2,048              | yes       | no                    | no             | no                 | EMS DOS driver<br>several RAM<br>disks<br>diagnostics | one year                | \$299.95            | n/a                 | coming up            |
| Zuckerboard<br>Expansion Memory<br>ATD | 256/512                | no        | yes(no)               | no             | option (\$49)      | option \$49<br>(RAM disk,<br>print spooler)           | two years               | \$109               | \$149               | 8/86, p. 108         |

##Must be added to 640K 1000  
\*\*Expanded Memory Specification (Lotus/Intel/Microsoft)

#takes plug-on 2nd clock, 2nd serial port, or serial/clock combo (\$85, \$85, \$170) or Tandy PLUS boards

\*parts & labor MBG is money-back guarantee

Table 2. Memory board vital statistics.

# 8087 Support

by Ryan Davis-Wright

The early models of the 1000 didn't have a socket for the 8087 math-coprocessor chip, but the 1000A does. Several manufacturers have worked out hardware solutions that allow you to install an 8087 in your older-model 1000.

An 8087 chip can speed up many math-intensive operations, such as spreadsheets, statistical work, and CAD programs. Just plugging in an 8087, however, doesn't automatically speed up all your programs. To benefit, programs must be written specifically to use the 8087's math instructions.

The 8087, designed to work in tandem with the 8088, specializes in floating-point math operations on 80-bit numbers

(compared to the 8088's 32-bit integers). Depending on the operation, the 8087 can compute results from 10 to 100 times faster.

You can also write programs to take advantage of the 8087's capabilities, which you must access through Assembly language. Many C compilers have 8087 support, as do Turbo Pascal, True Basic, BetterBasic, and Modula-2.

While you can't ordinarily access the 8087 chip through Microsoft Basic, MicroWay sells an 87Basic package that patches itself to the Microsoft Quick Basic compiler. After you run a program through the compiler, it can take advantage of math properties of the 8087 chip. ■

# Speedup Boards

by Ryan Davis-Wright

Everybody wants his computer to work faster, whether for calculating spreadsheets, finding a file, or compiling programs. Many users become impatient if the computer pauses for even a few seconds to process something.

When it comes to adding speedup boards, Tandy 1000 users are limited, since most of the products on the market haven't been tested on the 1000. Speedup boards usually replace the central processing unit (CPU) with a faster chip (either an 8088-2 or an NEC V20) and step up the clock speed via the 1000's 8248 chip. If you inquire about a board, ask if it has been specifically tested with the 1000.

If you own a 1000A, the model with the 8087 socket in it, you have another problem. When Tandy upgraded from the 1000 to the 1000A, it replaced the socketed 8248 clock chip with on-board VLSI (very large-scale integrated) circuits, making the boards that access the 8248 chip unusable with the 1000A.

I looked at the SURPRISE! board from Maynard Electronics, OverThrust from Nucleus Corp., Fast88 from MicroSpeed Inc., and the SpeedPac 286 from Victor Technologies. First the bad news: Only the Fast88 worked on my 1000. None of the others would even boot up. After installing OverThrust and SURPRISE!, all I could get out of the computer was harsh feedback noise. And Victor's SpeedPac 286 nearly fried my computer, since the manual failed to note that proper placement of the 8088 CPU is crucial to the board's working correctly. (The 1000's 8088 is socketed exactly opposite from the IBM PC's.)

Another board that doesn't quite work with the 1000 is the TinyTurbo (using an 80826 processor) from Orchid Technology. The board gives a 2.8 Norton rating, but the software caching, which would normally boost the rating to over 6.0, doesn't work at all.

## A Frisky 1000

MicroSpeed has done limited testing of

the Fast88 in the Model 1000 and reports no compatibility problems. The 1000A is, as mentioned above, another story.

The Fast88 replaces the 8088 CPU with either a 8088-2 or an optional V20 chip. (The V20 seems to offer a more substantial speed increase.) It also plugs a cable into the 8248 socket.

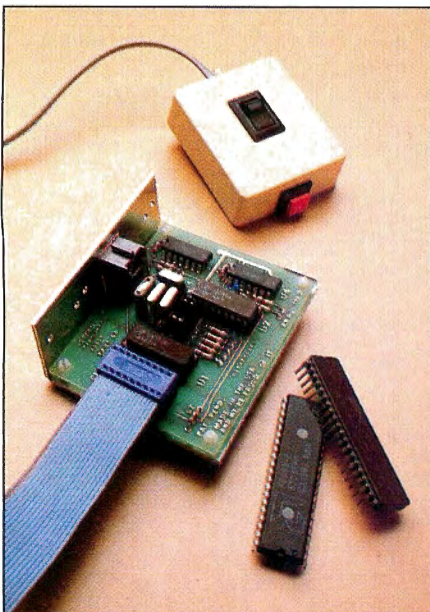
The Fast88 is a little board (3½ inches square) that can be installed up against the power-supply wall in your computer. The board has a wire extending from it that leads to a little box kept outside the computer. The box has two buttons: one for speed on/off and the other to reset your computer.

The Fast88 can run at three speeds—6.1, 6.4, and 7.4 MHz—which are set by changing a jumper on the board. If your computer can't handle the higher speeds at bootup, you can run it at low speed during the boot sequence and then shift into turbo once you're at DOS. You might also have problems accessing floppy-disk drives at the higher speeds. Lower the speed until you reach a point where you can crank it up. I tried it at 7.4 MHz with a 20MB hard disk and had no trouble booting up and running programs.

The Fast88 manual is superb. It does a terrific job of pointing out all the possible problems with such a product and includes an extensive index.

Peter Norton's SYSINFO program, which rates how fast computers run, gives the standard IBM PC (and Tandy 1000) a 1.0 rating. With the V20 chip installed and the speed off, the rating is 1.7. With the speed at 7.4 MHz, the rating is 2.8. Programs definitely ran faster and the 1000 had a friskier feel.

Other manufacturers are developing speed-up boards for the 1000. PC Technologies is working on its 286 Express board (which uses an 8-MHz 80286 AT processor) and Dynatec Systems is adapting its 10-MHz 8088 speed demon, Supercharger. Both might be on the market by the time you read this. ■



MicroSpeed Inc.'s Fast88.

Circle 293 on Reader Service card.

POP QUIZ

# C FEVER *catch it!*

It's becoming an epidemic . . . everyone is switching to C! First there were a few hackers, then came the college students, next the major software houses, and now the rest of the programming world. Programmers everywhere are infected with the desire for SPEED, POWER, and PORTABILITY.

It's time to face the inevitable. You're going to catch the fever too! When you do, give us a call. We've got the best cure—an illustrated guide to the C language, plus a complete program development system. Everything you need to master the C programming language . . . all at a price that's less than the cost of a book!

But don't let this price fool you. Our system is powerful; it compiles twice as fast as the others, is completely standard, and it's very easy to use. Most C compilers are designed for wizards. We have designed ours for you!

**What do you get for a mere \$39.95?**

- A 450 Page book filled with sample programs, plus . . .
- A fast, standard, full featured C compiler that supports all data types and the latest features like bit fields, enumerations, structure assignment, and passing/returning structures.
- A fast linker that loads separately compiled files, searches libraries, and builds an executable program.
- An extensive library of more than 170 functions (including the standard C functions and the computer specific functions that provide direct access to the operating system and BIOS).
- Tools that allow you to optimize your programs for minimal space or maximum speed.



**Works on all  
MSDOS/PCDOS  
and all CP/M Z80  
COMPUTERS!  
(Not Copy  
Protected!)**

**The Powerful MIX  
C COMPILER**  
Harness the Power of the C Language  
with this full featured Compiler  
MIX software  
©1987 MIX Software, Inc.

**Incredible Value**  
**\$39.95**  
AT ONLY **With 30 Day**  
**Money-Back Guarantee**

Operators are standing by . . . Please use this Number for ORDERS ONLY!

**CALL TOLL FREE FOR RUSH ORDER DELIVERY!**

# 1-800-523-9520

**IN TEXAS, PLEASE  
CALL TOLL FREE  
1-800-622-4070**

For Technical Support Please call 1-214-783-6001

MIX Software, Inc. / 2116 E. Arapaho / Suite 363 / Richardson, Texas 75081

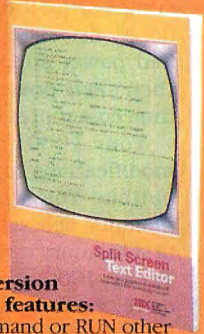
**Or contact our Worldwide Distributors direct in:**

Canada: Saraguay Software 1-416-923-1500 Switzerland: DMB Communication CH-1-825-53-29  
Australia: Techflow 047-586924 France: Info/Tech 1-43-44-06-48

## Split Screen Text Editor

**an Incredible Value**  
**AT ONLY \$29.95**  
(Not Copy Protected!)  
Works on all MSDOS/  
PCDOS and CP/M Z80  
Computers

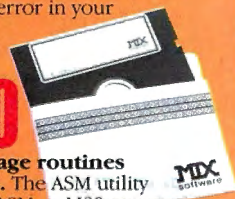
Our high powered editor is great for editing high level languages. **It works just like Micropro's Wordstar<sup>SM</sup>** but macros allow you to create your own custom editor, and the split-screen feature lets you edit two files at the same time.



**The MSDOS/PCDOS version is loaded with special features:**

- Execute any DOS command or RUN other programs from the editor.
- Quickly edit files as large as 300,000 characters.
- Compile MIX C programs directly from memory. The editor automatically positions the cursor to the first error in your program.

**ASM UTILITY**  
**an Incredible Value AT ONLY \$10**



**Call assembly language routines from your C programs.** The ASM utility works with Microsoft's MASM or M80 assembler. Macros make it easy! Works just as if you were calling a C function, and you can even call C functions from assembly language. Lots of useful assembly language functions are included as examples.

## RUSH REPLY ORDER FORM!

**SPECIAL OFFER!**

Buy both for an even greater value!

SAVE \$14.95 Off Our Regular List Price!

**Limited Time Only \$54.95**  
C Compiler & Text Editor

**Please check method of payment:**  
 Check  Money Order  MasterCard/VISA

Your Card #: \_\_\_\_\_

Expires \_\_\_\_\_

**Shipping Charges:** (No charge for ASM Utility)

**In the U.S.A.:** Add \$5.00 per Order.

**In CANADA:** Add \$10.00 per Order.

**OVERSEAS:** Add \$10.00 per Text Editor. Add \$20.00 per C Compiler. Add \$30.00 for combined C Compiler and Text Editor.

**Operating System: (Check one)**

CP/M Z80  MSDOS/PCDOS

Specify Your Computer Name \_\_\_\_\_

Specify Disk Format \_\_\_\_\_

NAME \_\_\_\_\_

Telephone A/C (\_\_\_\_\_) \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Country \_\_\_\_\_ ZIP \_\_\_\_\_

| Description                          | Quantity | PRICE   | Total Order |
|--------------------------------------|----------|---------|-------------|
| Split-Screen Text Editor             | _____    | \$29.95 | \$_____     |
| C Compiler                           | _____    | \$39.95 | \$_____     |
| C and Text Editor (Special)          | _____    | \$54.95 | \$_____     |
| ASM Utility                          | _____    | \$10.00 | \$_____     |
| Texas Residents Add 6.125% Sales TAX |          |         | \$_____     |
| Shipping Charges (See at Right)      |          |         | \$_____     |
| <b>TOTAL OF YOUR ORDER:</b>          |          |         | \$_____     |

**MIX software** 2116 East Arapaho Suite 363 Richardson, Texas, 75081  
**Ask about our Volume Discounts!**  
Call 1-214-783-6001

# Pointing Devices

by Ryan Davis-Wright



The Tandy Digimouse, Lynx Trackball, and Microsoft Mouse (left to right).

Sometimes the keyboard is not enough. Moving around on screen can be tedious and graphics programs are particularly difficult to use with a keyboard. As an alternative, a mouse has some obvious advantages over keys, particularly when you are working with graphics packages.

Among its disadvantages, a mouse needs room to roam across your desk. Also, since the rolling ball or light beam of the mouse is facing the desk, it is subject to slight movements and is difficult to control.

We've checked the Microsoft Mouse and Tandy's Digimouse (see Dave's MS-DOS Column, July 1986, p. 84). While they look alike, the Microsoft Mouse is clearly the superior choice. It has a smooth-rolling, rubber-coated ball that doesn't need a lot of room. The manual is well written and gives instructions for writing your own mouse drivers and interfaces. Installation is a snap, since all you do is plug it into the serial port.

The Digimouse from Tandy is another story. It has a rough-riding ball bearing that makes a lot of noise as it moves across your desk. It needs a special board: either the clock/mouse board or a clock/mouse add-on option for the Memory PLUS expansion board. This might well be the worst piece of hardware that Tandy has

marketed for the Model 1000.

The other mice mentioned in the index at the end of this article should be compatible with the 1000, but we haven't tested them yet. The Logitech and the Maynard Mouse use a rolling ball, while the PC Mouse uses a light beam that is supposed to give steadier tracking.

There are alternatives to the mouse. We've reviewed the Lynx Trackball and the Lite-Pen Plus in this issue (p. 30). The Lynx Trackball is a mouse turned upside-down. Instead of rolling a mouse across your desk, you roll your hand over the ball that is on the top. The idea makes sense, and the trackball solves the jittery-hand problem. The Lynx Trackball stays in one place and is a welcome alternative to a mouse.

Another new input device is the Lite-Pen Plus. Instead of rolling things around on your desk, you touch the screen to move the cursor. The pen picks up the coordinates from the screen and interprets the proper commands. It doesn't clutter your desk, and there are advantages to painting and moving directly on screen. For an artist, it might be the best device. The Lite-Pen Plus was a handy performer, but you might have problems interfacing it to other programs. ■

# Hard-Disk Drives

by Dave Rowell



The Tandy 10MB external hard drive (top) and Disk Cartridge System.

Low prices have moved hard drives out of the luxury category. To some, they are a necessity. A healthy number of companies provide hard drives for the Tandy 1000, many of which we've tested. Here are some things you should know before shopping.

A hard-drive kit provides the hard drive itself, a short controller board that takes one of your three expansion slots, and two ribbon cables to transfer information between the drive and controller board. Plated magnetic recording surfaces are more durable than oxide coated. Internal drives usually slide into the half-height compartment above your first floppy drive and accept the three-wire power connector meant for a second floppy.

Because Tandy doesn't supply the standard 1000s with hard-drive utilities, some (but not all) kits come with the programs needed to partition and format your drive. Fewer give you the full set of MS-DOS hard-drive utilities, including Backup and Restore. Most companies provide a head-parking utility that moves the read/write heads to a safe area on the platters in preparation for moving your computer. The latest 1000 MS-DOS (2.11.22) comes with a parking utility (SHIPTRAK.COM), but you should use the utility designed for your drive. You might end up trying to park the heads where they shouldn't go.

Off-the-shelf PC drives are not 1000 compatible. Since Tandy switched the hard-drive interrupt-request line from 5 to

2, hard-drive suppliers must reprogram the EPROM-based I/O routines on their controller boards. All the suppliers listed below provide half-height drives with modified controller boards. When ordering, however, make certain that you specify Tandy 1000. All the drives we've looked at have low to moderate power consumption (in the same range as the 1000's floppy drive), suitable for the 1000's limited power supply. External drives have their own power supply and case (and thus cost more).

Your 1000 might need some minor modifications to make it hard-drive compatible. You will need the DMA (direct memory access) chip that comes with a first memory upgrade. If you own an older Tandy 1000 and buy a non-Tandy hard drive, you might also need to upgrade to BIOS (basic input/output system) ROM 1.01. (Check for your ROM version in the message that appears when you boot up.) A Radio Shack computer-repair center can make the chip replacement for about \$40. If you have an old PBJ MFB-1000 multifunction board, you might also need a different DMA chip. (PBJ will make the switch for free or very inexpensively.)

If you buy a drive 20MB or larger, you should also purchase PC-DOS 3.1. In addition to general improvements (e.g., you can run a program in another subdirectory if you give the full path name), it divides a 20MB drive into 2K clusters (the

minimum space allotted for files). DOS 2.x, designed for the IBM PC/XT's 10MB drive, formats a 20MB drive into wasteful 8K clusters.

### **HDS Internal 10MB**

Hard Drive Specialist (HDS) developed the first third-party hard drive for the Tandy 1000. The 10MB internal kit we tested came with a Western Digital controller board and Tandon 5¼-inch drive; it now comes with a plated, power-efficient Tandon 3½-inch drive (10 watts [W] on power up but only 6W while running). HDS supplies a complete set of MS-DOS hard-drive utilities: the same Tandy disk that comes with hard-drive kits from Fort Worth.

The HDS 10MB drive performed 10 percent faster than a standard PC/XT drive on the Doran test (running Norton Utilities' Disktest program with the /D option), testing 48.56K of disk per second (KB/s) compared to the standard PC/XT value of 44 KB/s. (See Dave's MS-DOS Column, February 1986, p. 84.) The only problem noted was the controller-board startup routine's refusal to boot copy-protected disks (SubLOGIC's Jet) from drive A. You can run Jet from the DOS prompt.

### **J&M Systems 10MB Internal**

The J&M drive kit consists of a Micro-computer Memories Inc. (MMI) 3½-inch drive rated at 12W average power consumption. The unusual Konan controller board shows no circuit traces and uses many contact-soldered chips. With no support bracket, it screws to the 1000's back plate via a small metal tab. J&M supplies an extension to the 1000's three-line power cord. Besides being necessary to reach the drive's power plug, the extra length helps with testing the drive outside your 1000 before installation. In addition, you get a chip containing the original PC controller ROM with instructions to make the drive work in a standard PC clone.

The Tandy-specific instructions for physical installation are adequate (better than most). J&M doesn't supply you with any software, so you'll need PC-DOS 2.x or greater or the Tandy hard-drive utilities. J&M's controller ROM has a fairly sophisticated program that formats (low level) and partitions the MMI drive, but you still need a high-level format program (e.g., MS-DOS HFORMAT). The built-in format program lets you set the interleave and several partitions if you need them.

J&M states that you need a version of PC-DOS, which is true if you follow their formatting instructions. MS-DOS 2.11 won't boot from the hard drive or read the last .6MB of disk space. J&M suggests formatting 18 sectors per cylinder, giving a total disk capacity of 10.7MB. We found that using the standard (PC/XT) 17 sectors per cylinder reduced disk size to 10.1MB, but also allowed the use of the

1000's MS-DOS 2.11 as an operating system. The Tandy SHIPTRAK head-parking program also works with the J&M drive. The 1000's HSECT low-level format program does not work.

Using MS-DOS 2.11 instead of PC-DOS 2.1 also gave the drive much faster sequential-access times. The Doran test ran at 60.14 KB/s compared to 44 KB/s for a standard PC/XT drive. The Core test gave run-of-the-mill readings of 16.5 milliseconds (ms) for average track-to-track time, and 101 ms for average random-access time. These readings essentially agree with MMI's ratings of 18 ms track-to-track and 75 ms average access time. The fast sequential access probably results from the drive's ability to use a low interleave (3) and the controller board mechanisms. The MMI drive is louder than most, but bearable.

### **Tandy 10MB External**

Tandy provides a 10MB external hard drive you can install yourself. (They recommend that a Tandy repair center install their internal 10MB drive.) The unit we tested contained a 5¼-inch Tandon 252 drive controlled by a Xebec expansion board. As an external drive, it has its own power supply. Tandy provides a the full set of MS-DOS hard-drive utilities and detailed installation instructions.

### **Qubie PC20-1000 20MB Internal**

The Qubie 20MB drive should provide you with plenty of storage space. The Tandon 622, 3½-inch plated drive uses 14W. You must clip one-half inch off the Basic Time controller board's support bracket to make it fit in the 1000. Qubie gives you bundled software (the DOS shell program ldir and text-retrieving Zyindex), but an incomplete set of hard-drive utilities. The physical installation instructions are frustrating to boot, but Qubie's technical service department is helpful.

The drive comes formatted, and Qubie provides a low-level formatting utility (QUBIEFMT.COM), but you'll need FDISK to partition and a high-level format program. You can use MS-DOS 2.11.22 if you have the Tandy hard-drive utilities, but PC-DOS 3.1 is your best bet for getting the most efficient use of a 20MB hard drive. Qubie does provide other utilities and a park program (QPARK.COM).

Qubie's 20-megger performs well with a Doran time of 53.15 KB/s when formatted with the Qubie-recommended interleave of 3. The Core test produced times of 17 ms track to track and 92 ms average random-access time. Qubie rates their drive at 80 ms average access time.

### **Statewide 20MB Internal**

You can have two internal floppy drives and a Statewide 20MB hard drive, because the Statewide occupies the empty space

between the 1000's drive cage and the expansion board area. The Statewide kit supplies the same Tandon 3½-inch plated drive as Qubie (14W power consumption), but with a customized Western Digital controller board. The DOS shell program LeMenu comes with the drive kit, along with enough programs to get you set up.

The instructions described installation in an IBM only, but we managed. Statewide should have 1000-specific instructions shortly. The drive comes formatted, and if you have trouble now or in the future, Statewide insists it be reformatted at the factory. Setup is simple; you run a batch file that transfers your DOS system files to the hard drive. Another batch file can set up LeMenu as an operating-system shell program. You get a head-parking program, but no Backup and Restore.

The Statewide is fast for an XT-type drive, producing a Doran test rating of 59.7 KB/s. The Core test produced readings of 17 ms track to track and 100 ms average random-access time. Statewide rates their 20MB drive at 65 ms average access time.

### **Bernoulli Box**

Tandy sells the Disk Cartridge System (DCS), a version of Iomega's Bernoulli Box, for its MS-DOS computers. Bernoulli technology achieves hard-drive access speed and recording densities from a flexible-surfaced disk without risk of head crashes. One light, damage-resistant cartridge (about \$80) holds 10MB of data. If all your data doesn't have to be on one disk, you have unlimited storage capacity at hard-drive speeds. You can't boot from a Bernoulli disk, however.

The 10MB DCS comes with an interface expansion card, one 10MB cartridge, and the Iomega equivalent of hard-drive utilities, including format, backup, and restore programs. A copy program let's you back up one Bernoulli cartridge to another (two-drive model) in less than five minutes. With the Doran test, Tandy's DCS ran faster than any hard drive I've tested: 63.4 KB/s. It does make a constant ticking noise after 10 seconds of inactivity—the result of a random head-seeking pattern that distributes wear evenly over the cartridge. You can flick the lock lever open to stop it.

### **Other Options**

As hard-drive prices drop, a number of hard-disk cards, which put a 3½-inch hard disk on a board that fits into one of the slots in the computer, have come on the market. Express Systems, which makes a 20MB hard-card for the IBM PCs, is now working on a 1000-specific hard-card. It should be available by the time you read this.

Other hard drives advertised for the Tandy 1000 that we haven't tested are listed in the Product Index at the end of the article. ■

# Disk Drives

by Ryan Davis-Wright

The Tandy 1000 is more than two disk drives, 640K, and a color monitor. The market for MS-DOS computers is rife with add-ons. Depending on how you use your computer, you can upgrade to some interesting configurations for a relatively small investment.

Two good upgrades are Manzana Microsystems' MDP3T, a 3½-inch, 720K disk drive, and Pacific Micro Systems' Pelican, a 5¼-inch, 2.78-megabyte (MB) drive. Both are powerful peripherals that expand your computer's capabilities.

## Small Wonder

The Manzana MDP3T (\$550) is a double-sided disk drive like the one in IBM's PC Convertible and other MS-DOS laptop computers. Though you will probably want to use this drive (which needs an outside power source) beside your machine, Manzana does sell an internal version, the MDI3 (\$355), that you can install as drive B.

Perhaps because it's new for the 1000, installation of the MDP3T is a bit tricky. The preliminary manual gives wrong instructions about cable placement and jumper settings on the MUX adapter card that must be installed. Contrary to instructions, I had to twist the disk-drive cable and reset a jumper because of an inner port conflict that kept hanging up the machine. Manzana has noted the problems and says it will correct them in a new manual.

Once set up, Manzana's 3½-inch wonder has a lot going for it. It doubles the disk space of the 1000 (720K versus 360K), it's quiet, and the box doesn't take up much room. I had no difficulty moving files between the 3½-inch drive and the 1000's standard 5¼-inch drives. If you own an MS-DOS portable computer, it lets you move files between your desktop system and the portable, as well. You can read and write to a variety of computers, including Data General DG One, Toshiba T1100, IBM PC Convertible, GRiD Compass, Atari 520 ST, Tandy 600, and Hewlett-Packard HP 110 and 150. The drive can also read and write to single-sided disks.

The 3½-incher is only marginally faster than a regular floppy drive, but its other capabilities far outstrip those of a regular 5¼-inch drive. While 3½-inch disk prices

are high compared to other formats, you will probably see some price erosion as the format becomes more widespread.

## A Giant Pelican

Pacific Micro Systems' 2.78MB Pelican disk drive (\$695) isn't petite like Manzana's MDP3T. Measuring 13 inches long, 6½ inches high, and 2½ inches wide, it takes up quite a bit of room on your desk. And weighing in at a hefty 7½ pounds, it's not a component you're going to move around.

The Pelican uses special Verbatim floppy disks, but it really operates more like a hard drive. It has fast access and can store a huge amount of data. Since you can change disks at will (just like a regular floppy drive), you have unlimited storage—sort of like a poor man's Bernoulli Box. The disks are available from Pacific Micro Systems in packages of five (13.9MB). Each package sells for \$65.

Setting up the Pelican is easy, thanks to its well-written manual. The drive plugs into a card that you install in the back of the 1000; your machine must have at least 512K RAM and a DMA chip. While the unit is sturdy, the Verbatim disks seem more fragile than regular disks. They do, however, come with a lifetime guarantee. Nevertheless, with so much data crammed onto them, you should exercise the utmost care.

The software utilities supplied include a format command, a cache program, and a verify-disk utility. (Check disks carefully and map out bad sectors.) You can do one-disk copies with the Pelican and transfer data between it and other drives. You can also read from (but not write to) regular floppy disks.

The Pelican software has a dangerous command called Lock, which you can use to speed up the cache operation. However, before removing the disk, be sure to unlock it. If you don't, any new disk you put in will be trashed. Use the Lock and Unlock commands at your own risk.

The Pelican is an interesting solution to the mass-storage problem. With it, you don't have to worry about filling up your hard disk. As a backup, it's ideal, since only four 2.78MB disks are required to back up a full 10MB hard disk. ■



The Manzana MDP3T 3½-inch drive (top) and Pacific Micro Systems' Pelican 5¼-inch drive.

# Trackstar Apple Emulator Board

by Bradford N. Dixon

I was always warned about trying to mix apples and oranges; everyone said it just couldn't be done. But it turns out that you can mix Apples and Tandys. With the addition of Diamond Computer System's Trackstar Apple Emulator Board (\$375), my Tandy 1000 mixes just fine with Apple software.

## Simple as Apple Pie

The Trackstar system consists of two

printed-circuit boards and the necessary cables for connecting them to your Tandy 1000's disk drives and your monitor. A 10-inch board fits into one of the Tandy 1000's three expansion slots and houses the emulator's 6502 chip. The smaller second controller interfaces with the 1000's disk controller and connects directly to the unit's floppy disks. While the installation instructions are clear, they are misleading in one area that could give you

problems if you're not accustomed to taking your machine apart.

The first step in installing the system is to add two capacited jumpers to the 1000's disk drives. The Trackstar manual says to remove a few bolts on the sides of the drives, remove the drives, and add the jumpers. Unfortunately, that won't do it. I had to completely remove the drive mount box to get the drives out and install the jumpers on the drives, making the machine look pretty empty all the while. Perhaps this is why Tandy usually sells the Trackstar system installed to schools looking to take advantage of the emulator. Nonetheless, once the drives are back in the computer, installing a new disk-drive controller board and the main Trackstar board was as easy as adding a new memory board to the unit.

If you're a die-hard Tandy user, the first time you boot an Apple program on the Tandy 1000 you'll probably look over your shoulder to see if anyone is watching. I can hardly believe that I can make my 1000 drives read Apple disks and then actually run the programs. The drives even have that funny purring sound emitted by Apple drives.

Compatibility testing conducted by Dr. Chris Templar at Johnson Bible College in Knoxville, TN, revealed that only 10 disks of 360 would not run using the Tandy 1000 and the Trackstar board with either the internal drives or an external Apple drive. Problems with the disks that did not work were generally attributed to copy-protection schemes. Popular programs from Grolier, MECC, Milton Bradley, The Learning Company, and many others were tested. Programs I tested, which all ran with no problems (including joystick control), include Kidwriter from Spinnaker, EduCalc and Note Card Maker from Grolier, Snake Byte from Sirius Software, and Sea Dragon from Adventure International. Also, Diamond offers a set of patches that allows you to run Appleworks, the successful integrated program.

After using the Trackstar system and looking at the compatibility testing done on it, I can't help but be impressed. The emulator doesn't detract from using the 1000 as an MS-DOS machine, since the emulation software can even be configured to run in the background (with enough memory), ready to be called by pressing the alternate and escape keys from a DOS prompt.

One unfortunate circumstance is that Tandy doesn't sell the Trackstar through their EOH (Express Order Hardware) service. It is available only to educational institutions through Tandy. You can, however, obtain the board directly from the manufacturer, though you'll have to install it yourself. This one fault aside, I found the Trackstar everything it was touted to be and more. ■

**TANDY®  
COMPUTERS**  
with the Manufacturers  
Warranty.

**ALWAYS AT SALE PRICES  
AND WE SHIP FAST!**

*(Normally next business day...)*

**Do You Want A Real Warranty. . .**

or will you settle for a vague promise?

**S**ince 1977, we have operated a Radio Shack Authorized Sales Center (ASC), in the city of Grapevine, Texas. This will be significant for you only if (a) you want a warranty which you can exercise easily, if necessary and (b) the reassurance of our long term stability and business ethics.

When you buy a Tandy/Radio Shack product from us the Tandy/Radio Shack Warranty will accompany it and the warranty and service will be available to you, anywhere in the U.S.

We will not install any foreign parts which might, and probably will, have an adverse affect upon your warranty. We will assist you in obtaining local support, should you experience difficulty, and will make an offer to buy-our-product-back\* (hardware) if it dissatisfies you, within 30 days.

"We ship fast," has always been our motto and if anyone is offering you a lower price, we suggest you ask about the foreign parts (and warranty) before closing the deal. We will "NOT meet-or-beat" a lower price so you can be sure you have our best quote the first time, and our toll-free phone lines (outside Texas) make the quote easy for you to get, from 9 a.m.-5 p.m. central time, Monday thru Friday. (\*For a small handling charge)

**ORDER INQUIRIES AND CUSTOMER SERVICE  
(817) 481-SALE**



**Tandy 3000 Sale Priced at \$1895.00**  
(25-4001, monitor excluded)



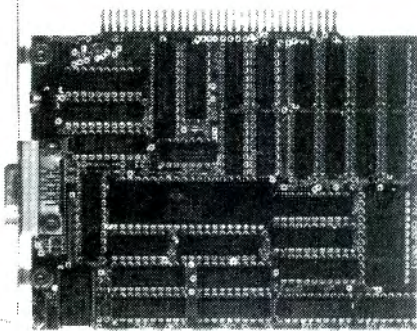
**DFW Computer Center**  
326 Main Street  
Grapevine, TX 76051

Customer Service & in Texas  
(817)-481-SALE 9am-5pm  
Central Time

**CALL FOR PRICES TOLL FREE 1-800-433-SALE**

# FULL POWER.

**PCA offers maximum IBM compatibility  
for your TANDY 1000.**



## Monographics Adapter

The basic Tandy 1000 BIOS and MSDOS do not support TTL monochrome boards. The monochrome graphics referred to in their documentation is simply a black and white version of their color graphics.

The advantages of a monochrome board over the color graphics display is that the characters are much sharper, the display rates are faster, and the monochrome board does not suffer from the jumpy display when used with programs which write directly to the screen. Also, some word processing programs will display underlining as underlining on the screen when used with a monochrome board.

The addition of monochrome graphics makes your Tandy 1000 much more versatile. Programs such as CAD systems, paint programs, etc. can show more detail. Graphics based systems such as Microsoft Windows and GEM show much clearer pictures. It will be possible to use Lotus 1-2-3 Version, 2A with the PCA Multiboard and have a 2MB spreadsheet with 38 rows and 90 columns!

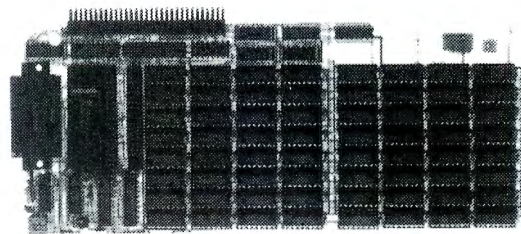
- Compatible with software written for the IBM Monochrome Display Adapter.
- Compatible with software written for the Hercules Graphics Card.
- Uses the same style standard character set used by the IBM Monochrome Display Adapter.
- Supports 720h x 348v monochrome graphics resolution making the PCA Plus fully compatible with Hercules graphics software.
- Flicker free display!
- 64K RAM on board will support two separate pages of graphics or text.
- Co-exists with an IBM compatible color graphics adapter (or IBM Enhanced Graphics Adapter) residing in another slot.
- Up to 100% video speed increase
- One Year Warranty.

### FREE TTL MONITOR

with purchase of PCA Monographics Adaptor for the Tandy 1000 or any IBM compatible.

with Free  
Monitor

**\$249**



## Multiboard - Free 256K RAM

The PCA Multiboard includes everything you'll ever need on one 10" card; serial port, clock/calendar, RAM Disk, Print Spooler, and room for up to 2MB of Lotus/Intel compatible RAM.

The Multiboard is also very easy to use, thanks to the PCA Technology Smart Setup program. By using Setup, you can change or disable the serial port, set or disable the clock, and allocate any amount of memory you wish without opening the case on your computer, and without having to set any switches.

The Multiboard keeps the information you decide on in a memory area that always stays on, even without any power. By using this technique the Multiboard will always return to the same setup after turning the computer off.

- Memory chip type : 41256, 256K DRAM
- Chip speed : 150ns
- Number of chips : 64 (8 per bank of 256K)
- Serial Port : Standard IBM compatible, COM1, COM2, or OFF
- Clock/Calendar : Set bt setup, system set automatic (can be disabled)

**Multiboard with FREE 256K RAM \$299**

**Fully populated 2MB \$499**

## Combine these two boards and take the Tandy 1000 to the max!

PCA Multi Board with **FREE EMS 256 RAM** installed, serial port and clock. **PLUS** the PCA Monographic adapter and **FREE TTL monitor.**

\*Special package price –

**\$499**

RAM \$40 per  
bank installed



**805/392-1714**

Dealer Inquiries Invited

2512 Pegasus Drive  
Bakersfield, CA 93308



# Cauzin Softstrip System

by Bradford N. Dixon

Data-entry systems sometimes evolve in unexpected ways, as evidenced by the recent introduction of the Cauzin Softstrip System from Cauzin Systems Inc. The Softstrip System is a printed-data coding system, with which Cauzin hopes to find a niche in the personal-computer market. Whether or not it's successful, some observers think the Softstrip System heralds a new generation of data-input technology.

The Softstrip System is capable of storing 5,500 bytes of information on a single 7- by  $\frac{1}{8}$ -inch strip of printed code. The system comes with a Softstrip Reader, power supply, RS-232 interface cable, communications software that accepts information from the reader, a user guide, and a library booklet with short programs printed in the Softstrip format.

## An Easy Read

Setting up the Softstrip System on the Tandy 1000 is easy. To get started, connect the interface cable to the RS-232 port at the back of the computer and plug the reader's power supply into a wall outlet. Make a backup of the communications software that comes with the reader, run it, and type CAUZCOMM at the DOS prompt.

When I loaded the communications program, an instruction box appeared telling me to press alternate-R to activate communications with the reader. After the instruction box, however, I received another message that said, "I can't figure

out what machine you have," and advised contacting my Cauzin dealer. Apparently, the few hardware differences between the Tandy 1000 and the IBM PC confused the software. Despite the message, the communications program loaded successfully and I was able to proceed.

Once you have correctly aligned the Softstrip data under the reader, you press the R key. A read head inside the plastic housing of the reader moves down the data strip, reads the encoded information, and sends it to the computer. The information is written to disk when the read head reaches the end of the Softstrip. I read and ran several Basic programs using data strips from the Softstrip library, which comes with the system. I also read and displayed several Softstrips from Cauzin advertisements in *Byte* and *PC Magazine*.

## A Soft Future?

As yet, the Softstrip format and reader have not made significant inroads into the world of microcomputer data entry and storage. The greatest source of Softstrip programs and data files is Cauzin's advertisements. The company hopes the system will catch on as a new means of transferring information from machine to machine and between media. The microcomputer industry, however, is usually reluctant to take on new, untried, and perhaps unneeded technologies. Cauzin Systems can expect a long battle. ■



The Cauzin Softstrip System data reader.

# Internal Modems

by Bradford N. Dixon

The incompatibility between the full-sized IBM PC expansion cards and the Tandy 1000's smaller slots has troubled some Model 1000 users. Fortunately, this incompatibility doesn't apply to internal modem cards.

The cards examined here represent but a sample of modems that will run on the 1000. While some cards mentioned require minor adjustments to fit inside the Model 1000, they still work well.

Options and prices vary widely. Before buying a modem card, you should decide what you want your modem to do and evaluate your needs against the features (and prices) of other internal modems.

## PCMODEM Half-Card

The Ven-Tel Inc. PCMODEM Half-Card is a Hayes-compatible internal modem that runs at 300 or 1,200 baud on the Tandy 1000. Since it is Hayes compatible, most terminal programs and bulletin-board system (BBS) software can use the half card with no modification. We used the Ven-Tel Half-Card with Perfect Link and SideKick terminal programs, as well as The Bread Board System electronic BBS software.

Installing the modem is as easy as inserting any expansion card, with one ex-

ception. You must clip the bottom of the mount holding the card to the Tandy 1000 chassis so the card will go completely into the expansion slot. This is not an unusual problem when dealing with cards designed for the IBM PC.

In addition to the hardware and a short telephone cable, the Ven-Tel modem package includes the Crosstalk XVI telecommunications program, so you can go on line as soon as the board is installed.

## Tandy 1,200-Baud Internal Modem

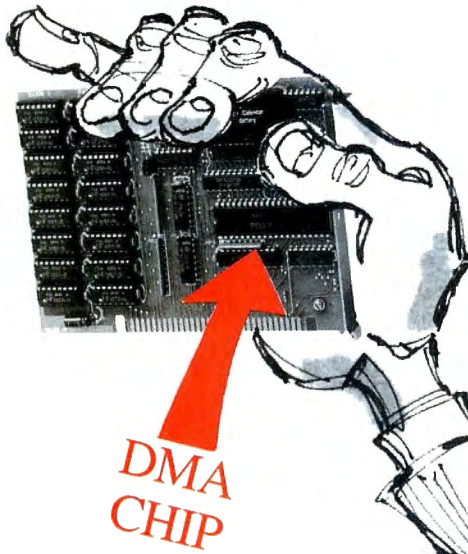
Tandy's entry into the internal modem-card arena is a Hayes-compatible board. While it has problems, they are more annoyances than hard bugs.

When you install the card you'll have difficulty inserting the phone plugs for two reasons. First, the jacks are critically close to the slot openings, making insertion clumsy. You must loosen the card support screw and adjust the placement of the board before you plug in the phone cord. The other problem is that the jacks fit very tightly compared to those of other modems.

The Tandy 1,200-baud modem has one other quirk that might bother Tandy 1000 power users. The Tandy modem does not work with the SideKick dialer, although it

# TANDY IS DANDY...

...until you want more



"...the Zuckerboard is a high-quality, reliable alternative to the high prices of Tandy's expansion memory boards."

June 1986 Issue

**PCM**

Magazine



| TANDY 1000             | Zuckerboard Expansion Memory | Tandy Memory Plus      |
|------------------------|------------------------------|------------------------|
| DMA with 256K          | Inc. \$109                   | Inc. \$319.95          |
| with 512K              | \$149                        | \$519.90               |
| Options:               |                              |                        |
| Clock/Calendar         | \$49                         | \$ 99.95*              |
| 256K Upgrade           | \$49                         | \$199.95               |
| RAM Disk/Print Spooler | \$49                         | N/A                    |
| Warranty               | 2 Years                      | 90 Days<br>*with mouse |

"... High Power Low Price." PCM

It's another

# ZUCKERBOARD



235 Santa Ana Court • Sunnyvale, CA 94089 • (800) 233-6874 (CA) • (800) 222-4920

Dr. Dr. Zucker



# It's another ZUCKERBOARD



235 Santa Ana Court • Sunnyvale, CA 94089  
(800) 233-6874 (CA) • (800) 222-4920

## FOR TANDY 1000

|          |       |  |
|----------|-------|--|
| 116-100  | \$109 | Memory Board with 256K   |
| 116-200  | 149   | Memory Board with 512K   |
| 116-300  | 49    | 20 Year Clock/Calendar   |
| 130-100  | 49    | 256K Chip Upgrade  |
| 115-256  | 109   | Secondary Memory Board with 256K   |
| 115-384  | 125   | Secondary Memory Board with 384K   |
| 116-400  | 249   | Multifunction Board with 512K + Serial + Ramdisk + Print Spool Software                          |
| 116-400C | 279   | Multifunction Board with 512K + Serial + Ramdisk + Print Spool Software + 20 Year Clock Calendar |
| 125-100  | 549   | Internal Half Height 20MBYTE Hard Disk includes Controller and Cables                            |

## FOR TANDY 1200

|          |       |   |
|----------|-------|---|
| 115-200  | \$149 | Memory Board with 512K                          |
| 119-200C | 198   | Memory Board with 512K + 20 Year Clock/Calendar |
| 115-300  | 125   | Memory Board with 384K                          |
| 119-300  | 174   | Memory Board with 384K + 20 Year Clock/Calendar |

## FOR TANDY 1000 & 1200

|         |       |                                  |
|---------|-------|----------------------------------|
| 124-000 | \$129 | Mouse                            |
| 124-100 | 159   | Mouse with PC Paint Software     |
| 129-000 | 49    | Ramdisk + Print Spooler Software |
| 130-000 | 109   | Keyboard Upgrade                 |

| Model                 | Qty.  | Unit Price | Ext. Price |
|-----------------------|-------|------------|------------|
| <b>FOR TANDY 1000</b> |       |            |            |
| 116-100               | _____ | \$109      | _____      |
| 116-200               | _____ | \$149      | _____      |
| 116-300               | _____ | \$ 49      | _____      |
| 130-100               | _____ | \$ 49      | _____      |
| 115-256               | _____ | \$109      | _____      |
| 115-384               | _____ | \$125      | _____      |
| 116-400               | _____ | \$249      | _____      |
| 116-400C              | _____ | \$279      | _____      |
| 125-100               | _____ | \$549      | _____      |

|                       |       |       |       |
|-----------------------|-------|-------|-------|
| <b>FOR TANDY 1200</b> |       |       |       |
| 115-200               | _____ | \$149 | _____ |
| 119-200C              | _____ | \$198 | _____ |
| 115-300               | _____ | \$125 | _____ |

|                                  |       |       |       |
|----------------------------------|-------|-------|-------|
| <b>FOR TANDY 1000 &amp; 1200</b> |       |       |       |
| 124-000                          | _____ | \$129 | _____ |
| 124-100                          | _____ | \$159 | _____ |
| 129-000                          | _____ | \$ 49 | _____ |
| 130-000                          | _____ | \$109 | _____ |

|  |       |
|--|-------|
| Subtotal                               | _____ |
| CA Residents add applicable tax        | _____ |
| Shipping \$6.00 per product in the USA | _____ |
| Total                                  | _____ |

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City, State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone \_\_\_\_\_

Visa  MasterCard   
 Number \_\_\_\_\_ Expires \_\_\_\_\_  
 Check or money order  
 Please allow 2-4 weeks for delivery

| Model                 | Qty.  | Unit Price | Ext. Price |
|-----------------------|-------|------------|------------|
| <b>FOR TANDY 1000</b> |       |            |            |
| 116-100               | _____ | \$109      | _____      |
| 116-200               | _____ | \$149      | _____      |
| 116-300               | _____ | \$ 49      | _____      |
| 130-100               | _____ | \$ 49      | _____      |
| 115-256               | _____ | \$109      | _____      |
| 115-384               | _____ | \$125      | _____      |
| 116-400               | _____ | \$249      | _____      |
| 116-400C              | _____ | \$279      | _____      |
| 125-100               | _____ | \$549      | _____      |

|                       |       |       |       |
|-----------------------|-------|-------|-------|
| <b>FOR TANDY 1200</b> |       |       |       |
| 115-200               | _____ | \$149 | _____ |
| 119-200C              | _____ | \$198 | _____ |
| 115-300               | _____ | \$125 | _____ |

|                                  |       |       |       |
|----------------------------------|-------|-------|-------|
| <b>FOR TANDY 1000 &amp; 1200</b> |       |       |       |
| 124-000                          | _____ | \$129 | _____ |
| 124-100                          | _____ | \$159 | _____ |
| 129-000                          | _____ | \$ 49 | _____ |
| 130-000                          | _____ | \$109 | _____ |

|  |       |
|--|-------|
| Subtotal                               | _____ |
| CA Residents add applicable tax        | _____ |
| Shipping \$6.00 per product in the USA | _____ |
| Total                                  | _____ |

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City, State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone \_\_\_\_\_

Visa  MasterCard   
 Number \_\_\_\_\_ Expires \_\_\_\_\_  
 Check or money order  
 Please allow 2-4 weeks for delivery

TEAR HERE AND SAVE TO BUY LATER

NO POSTAGE  
NECESSARY  
IF  
MAILED  
IN THE  
UNITED STATES



## BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 1625 SUNNYVALE, CA

POSTAGE WILL BE PAID BY ADDRESSEE

### ADVANCED TRANSDUCER DEVICES, INC.

235 Santa Ana Court  
Sunnyvale, CA 94089

ATTENTION: DR. DR. ZUCKER



NO POSTAGE  
NECESSARY  
IF  
MAILED  
IN THE  
UNITED STATES



## BUSINESS REPLY CARD

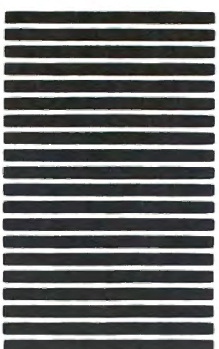
FIRST CLASS PERMIT NO. 1625 SUNNYVALE, CA

POSTAGE WILL BE PAID BY ADDRESSEE

### ADVANCED TRANSDUCER DEVICES, INC.

235 Santa Ana Court  
Sunnyvale, CA 94089

ATTENTION: DR. DR. ZUCKER



Dr. Dr. Zucker



# It's another ZUCKERBOARD



235 Santa Ana Court • Sunnyvale, CA 94089  
(800) 233-6874 (CA) • (800) 222-4920

### FOR TANDY 1000

|          |       |  |
|----------|-------|--|
| 116-100  | \$109 | Memory Board with 256K   |
| 116-200  | 149   | Memory Board with 512K   |
| 116-300  | 49    | 20 Year Clock/Calendar   |
| 130-100  | 49    | 256K Chip Upgrade  |
| 115-256  | 109   | Secondary Memory Board with 256K   |
| 115-384  | 125   | Secondary Memory Board with 384K   |
| 116-400  | 249   | Multifunction Board with 512K + Serial + Ramdisk + Print Spool Software                          |
| 116-400C | 279   | Multifunction Board with 512K + Serial + Ramdisk + Print Spool Software + 20 Year Clock Calendar |
| 125-100  | 549   | Internal Half Height 20MBYTE Hard Disk includes Controller and Cables                            |

### FOR TANDY 1200

|          |       |   |
|----------|-------|---|
| 115-200  | \$149 | Memory Board with 512K                          |
| 119-200C | 198   | Memory Board with 512K + 20 Year Clock/Calendar |
| 115-300  | 125   | Memory Board with 384K                          |
| 119-300  | 174   | Memory Board with 384K + 20 Year Clock/Calendar |

### FOR TANDY 1000 & 1200

|         |       |                                  |
|---------|-------|----------------------------------|
| 124-000 | \$129 | Mouse                            |
| 124-100 | 159   | Mouse with PC Paint Software     |
| 129-000 | 49    | Ramdisk + Print Spooler Software |
| 130-000 | 109   | Keyboard Upgrade                 |

does work with other programs' dialers.

### The Tandy 300-Baud Internal Modem

In the field of less expensive and less sophisticated 300-baud modems, Tandy has little to offer. The 300-baud internal board installs easily and can be configured to use either the COM1 or COM2 communications port, but that's where ease of use ends.

The biggest complaint that people have with their modems is the way they handle line noise when on line. Here the Tandy 300-baud modem falls seriously behind. When we used the modem to call CompuServe, it behaved poorly at times when other modems had no problems with telephone line noise.

Consider whether it's worth buying a cheaper modem if you must upload or download files several times because it doesn't handle line interference well. You might save more investing in a better modem.

### SideDialer

Quattel's short-card telephone-dialer board is a simple add-on card that might find a niche in the Tandy 1000 business market. The SideDialer is not a modem, rather it takes a phone directory that you compile, or SideKick's phone directory, and dials the phone for you.

The short board is easy to install once you've clipped the chassis mount. The memory-resident SideDialer software is also a snap to install. During the installation process, the software prompts you to supply information regarding your monitor type, display colors for the SideDialer window, tone or rotary dialing, length of dialing pauses, and whether or not you want to press a key before dialing continues.

Included with the board is an installation disk, simple instruction card, and a short telephone cable. This is a nice package that serves its simple purpose.

### Everex EV-920

The EV-920 300-/1,200-baud internal modem is billed as a smart modem that can do just about everything except take messages for you.

Installation of the half-card EV-920 is easy, but like the Ven-Tel and the SideDialer, the chassis mount on the board must be clipped to fit in the Tandy 1000. Being a Hayes-compatible unit, the Everex modem works with SideKick and Perfect Link.

The smart aspects of the modem include automatic baud adjustment, auto-answer/auto-dialing capability, automatic voice/data switching, and automatic speaker control. The EV-920 can be configured to use COM ports 1-4 on an IBM PC, but for use in the Tandy 1000, only COM1 and COM2 are supported. ■

# Product Index

## 8087 Support

### Hard Drive Specialist (HDS)

16208 Hickory Knoll  
Houston, TX 77059  
800-231-6671 or 713-480-6000  
8087 Board: \$249 (Model 1000)  
8087 Upgrade: \$119 (Model 1000A)

### MicroWay

P.O. Box 79  
Kingston, MA 02364  
617-746-7341  
87Basic: \$150

### PG Design Electronics

66040 Gratiot  
Richmond, MI 48062  
313-727-2744  
Speed Ticket: \$249 (Model 1000); \$149 for the 8087 only

### Trionix

3563 #B Roosevelt St.  
Carlsbad, CA 92008  
619-434-4439  
8087 Board: \$235 (Model 1000)  
\$110 without the 8087

## Cauzin Softstrip

### Cauzin Systems Inc.

835 Main St.  
Waterbury, CT 06076  
Cauzin Softstrip System: \$199.95

## Disk Drives

### Manzana Microsystems Inc.

P.O. Box 2117  
Goleta, CA 93118  
805-968-1387  
MDP3T 3½-inch disk drive: \$550.

### Pacific Micro Systems Inc.

160 Gate 5 Road  
Sausalito, CA 94965  
415-331-2525  
Pelican 2.78MB disk drive: \$695.

## Hard-Disk Drives

### HDS

(See address above)  
\$549 (10MB); \$749 (20MB); \$1,349 (42MB); \$769 (20MB that doesn't use drive compartment); add \$150 for external versions. One-year warranty.  
Issue reviewed: Dave's MS-DOS Column, February 1986, p.84.

### J&M Systems

15100-A Central SE  
Albuquerque, NM 87123

505-292-4182

\$495 (10MB). 90 days parts and labor.

### Gube

Dept. W  
507 Calle San Pablo  
Camarillo, CA 93010  
800-821-4479  
PC20-1000: \$499 (20MB); secondary drive without controller, \$399. One-year warranty (with 30-day, money-back guarantee).  
Issue reviewed: August 1986, p. 106.

### Statewide

Ten E. 22nd St.  
Lombard, IL 60148  
800-882-8311  
\$779 (20MB). One-year warranty.  
Issue reviewed: August 1986, p. 106.

### Tandy Corp.

One Tandy Center  
Fort Worth, TX 76102  
817-390-3011  
Disk Cartridge System: \$2,395 with interface card; two-cartridge unit, \$3,395.  
Catalog no. 25-1245. 90-day warranty.  
Issue reviewed: Dave's MS-DOS Column, July 1986, p. 84.

External Hard Disk Drive: \$699 (10MB).  
Catalog no. 25-1025. 90-day warranty.  
Tandy Hard Disk Controller: \$299.95.  
Catalog no. 25-1007. 90-day warranty.

## Hard Drives Not Discussed

### Advanced Transducer Devices (ATD)

1287 Lawrence Station Road  
Sunnyvale, CA 94089  
408-734-4631  
Zuckerboard Internal Hard Disk: \$529 (10MB); \$599 (20MB). Two years parts and labor.

### Aerocomp

Redbird Airport Hangar #8  
P.O. Box 764246  
Dallas, TX 75376  
800-527-3582  
800-442-1310 in Texas  
Aerocomp 20: \$549 (20MB); \$749 (30MB). One year parts and labor.

### Bi-Tech (BT Enterprises)

10 Carlough Road  
Bohemia, NY 11716-2996  
800-645-1165  
\$495 (10MB internal); \$625 (20MB internal). One year parts and labor.

Index continued

**Express Systems Inc.**

1254 Remington  
Schaumburg, IL 60195  
800-341-7549, ext. 2900  
312-882-7733, ext. 2900 in Illinois  
Express Hard Disk Card: \$595 (20MB)

**Software Support Inc.**

1 Edgell Road  
Framingham, MA 01701  
800-343-8841  
Megadisk: \$359.95 (10MB internal);  
\$459.95 (20MB internal). One year  
parts and labor.

---

## Internal Modems

**Everex Systems Inc.**

48431 Millmont Drive  
Fremont, CA 94538  
415-489-1111  
EV-920 300-/1,200-Baud Internal  
Modem: \$249

**Quadtel**

2030 E. 4th St., #234  
Santa Ana, CA 92705  
714-543-7755  
Sidedialer: \$59.95

**Tandy/Radio Shack**

(See address above)  
300-Baud Modem Board: \$149.95. Cat-  
alog no. 25-1003.  
1,200-Baud PC Modem: \$299.95. Cata-  
log no. 25-1013.

**Ven-Tel Inc.**

2432 Walsh Ave.  
Santa Clara, CA 95051 408-727-5721  
Ven-Tel 300-/1,200-Baud Internal  
Modem: \$549

---

## Memory Boards

**ATD**

(See address above)  
Zuckerboard Expansion Memory: \$109  
(256K); \$149 (512K)

**HDS**

(See address above)  
Memory Only: \$195 (512K)

**McGraw-Hill CCIG Software**

8111 LBJ Freeway  
Dallas, TX 75251  
800-221-8439; 214-437-7411 in Texas  
Maxit: \$195 (256K)

**Micro Mainframe**

11285-E Sunrise Gold Circle  
Rancho Cordova, CA 95670  
916-635-3997  
MS5150 Memory Board: \$299.95  
(256K); \$579.95 (2MB)

**PBJ Inc.**

503 East 40th St.  
Paterson, NJ 07504  
201-523-8663  
XRAM: \$299.95 (256K); n/a (2MB)

**Turner Hall Publishing**

10201 Torre Ave.  
Cupertino, CA 95014  
800-556-1234, ext. 526; 800-441-2345,  
ext. 526 in California  
Turner Hall Card: \$99.95 (256K)

---

## Multifunction Boards

**ATD**

(See address above)  
Zuckerboard MFB: \$249 (512K)

**Automation Facilities Corp. (AFC)**

6383 Rose Lane  
Carpinteria, CA 93013  
800-543-2233; 805-684-5464 in  
California  
Master/Card (MEGboard): \$395 (512K);  
\$555 (1MB)

**HDS**

(See address above)  
TanPak: \$329 (no memory); n/a (512K)

**Micro Mainframe**

(See address above)  
4N1: \$199.95 (no memory); \$259.95  
(512K)  
All-N-1: \$349.95 (512K); \$930 (2.5MB)

**PBJ Inc.**

(See address above)  
MFB-1000: \$299.95 (128K); \$359.95  
(512K)

**PCA Technology**

2512 Pegasus Drive  
Bakersfield, CA 93308  
805-392-1714  
Multiboard: \$299.99 (no memory);  
\$499.99 (2MB)

**PG Design Electronics**

(See address above)  
2.5MB MFB: n/a (512K); n/a (2.5MB)

**SJS Engineering**

50 W. Brokaw Road, Suite 64  
San Jose, CA 95110  
800-452-4445, ext. 1131; 800-626-  
9541, ext. 1131 in California  
Full House: \$170 (no memory); \$315  
(512K)

**Tandy/Radio Shack**

(See address above)  
Memory PLUS: \$179.95 (256K);  
\$309.90 (512K with RAM kit). Catalog  
no. 25-1011.

---

## Pointing Devices

**Disc Instruments**

102 E. Baker St.  
Costa Mesa, CA 92626  
714-979-5300  
Lynx Trackball: \$139  
Issue reviewed: September 1986, p. 30.

**Lite-Pen Company**

P.O. Box 45255  
Los Angeles, CA 90045

213-305-7616

L-PC Lite Pen Color Monitor Pen:  
\$179.95  
Color plus mono pen: \$199.95  
Issue reviewed: September 1986, p. 30.

**Logitech Inc.**

805 Veterans Blvd.  
Redwood City, CA 94063  
415-365-9852  
Logimouse C7: \$99

**Maynard Electronics**

460 E. Semoran  
Casselberry, FL 32707  
305-331-6402  
The Mouse: \$215

**Microsoft Inc.**

10700 Northrup Way  
Box 97200  
Bellevue, WA 98009  
206-882-8080  
Microsoft Mouse: \$195  
Issue reviewed: Dave's MS-DOS Col-  
umn, July 1986, p. 84.

**Mouse Systems**

0100 San Tomas Expressway  
Santa Clara, CA 95051  
408-988-0211  
PC Mouse: \$195

**Tandy/Radio Shack**

(See address above)  
Tandy Digimouse: \$99.95. Catalog no.  
26-1197.  
Issue reviewed: Dave's MS-DOS Col-  
umn, July 1986, p. 84.

---

## Speedup Boards

**Dynatec Systems Inc.**

870 E. 9400 South  
Suite 103-B  
Salt Lake City, UT 84070  
801-572-1568  
Supercharger: \$279.95.

**MicroSpeed Inc.**

4307 Randall Place  
Freemont, CA 94538  
415-490-1403  
Fast88: \$149; \$20 extra for the  
V20 option.

**PC Technologies Inc.**

704 Airport Blvd.  
P.O. Box 2090  
Ann Arbor, MI 48106  
313-996-9690  
286 Express: \$595.

---

## Trackstar

**Diamond Computer Systems**

26459 Taaffe Road  
Los Altos Hills, CA 94002  
415-941-1221  
Trackstar Emulator Board: \$375. One-  
year warranty.



# USE THE BRAINS YOUR TANDY WASN'T BORN WITH.

## Right at your fingertips in CompuServe's Tandy Forums.

Our Tandy forums involve thousands of Tandy users worldwide. These forums will show you just how easy it is to get the most from your Tandy computer.

The **Tandy Professional Forum** supports users of the larger Tandy computers, including the MS-DOS and XENIX operating systems, encompassing the largest spectrum of Tandy microcomputer users of any of our Tandy forums.

The **Model 100/Portables Forum** is for users of Tandy laptop computers, providing functionality and portability in one package.

The **Color Computer Forum** is for the dual personalities of the Tandy Color Computer, the perfect home computer and highly respected microcomputer.

The **OS-9 Forum** provides support to an international group of users linked by a common operating system.

The **LDOS/TRSDOS® Forum** supports users of the LDOS operating system for Tandy Model 1 and 3 computers, as well as TRSDOS-6 users on the Tandy Model 4.

### Easy access to free software.

- Download first-rate, non-commercial user-supported software and utility programs.
- Take advantage of CompuServe's inexpensive weeknight and weekend rates (when forums are most active, and standard online charges are just 10¢ per minute).
- Go online in most major metropolitan areas with a local phone call.
- Receive a **\$25.00 Introductory Usage Credit** when you purchase your CompuServe Subscription Kit.

### Information you simply can't find anywhere else.

Use the Forum Message Board to exchange mail with fellow members. Join ongoing, real-time discussions in a Forum Conference. Scan Forum Data Libraries for free software, documentation and contributions from Tandy enthusiasts.

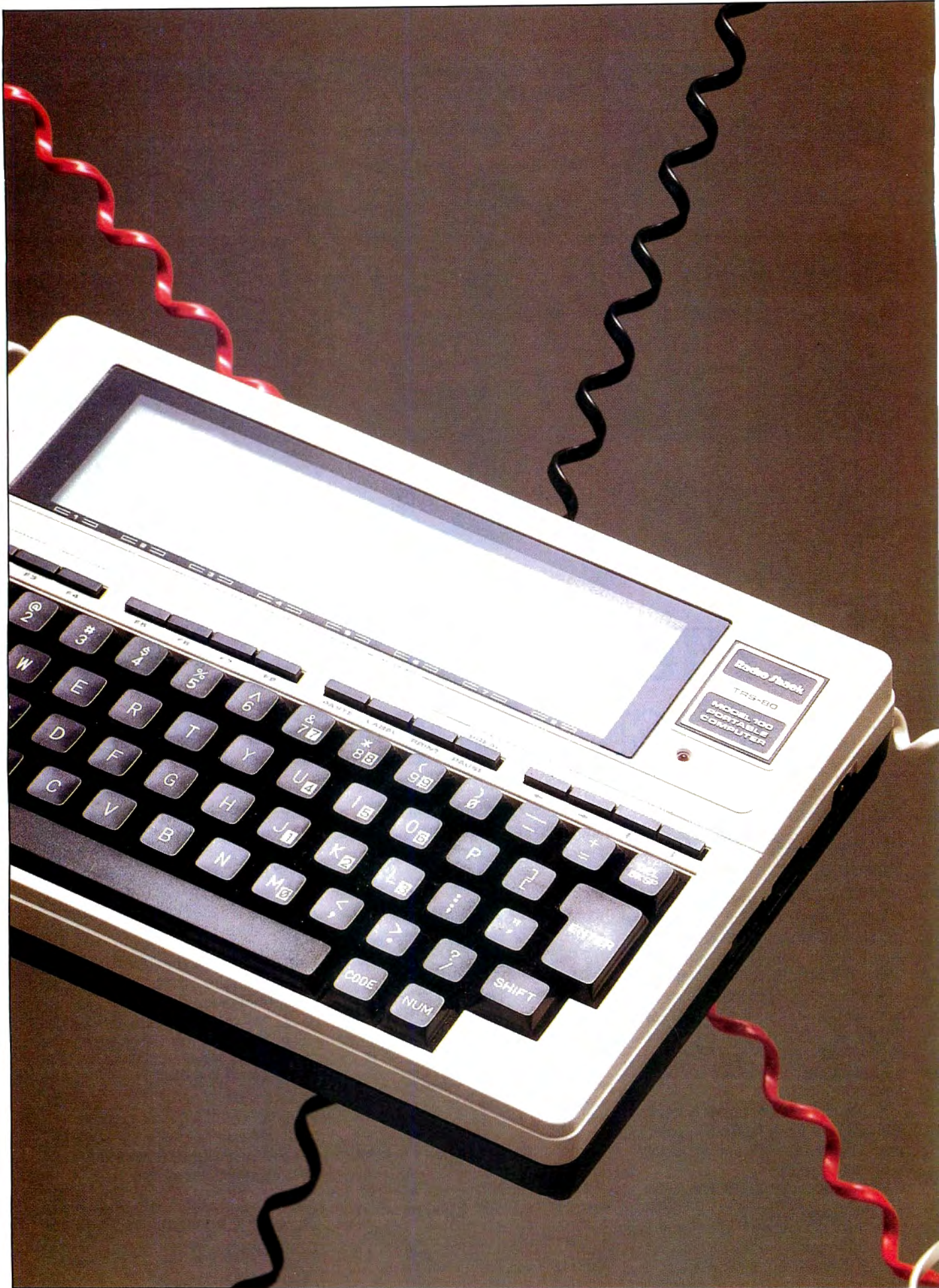
Enjoy other useful services too, like electronic editions of your favorite magazines, newsletters and articles, including the Tandy Corporate Newsletter, TCBUG (the Tandy Computer Business Users Group), and the Fort Worth Computer Chronicles.

### All you need is your Tandy computer and a modem... or almost any other personal computer.

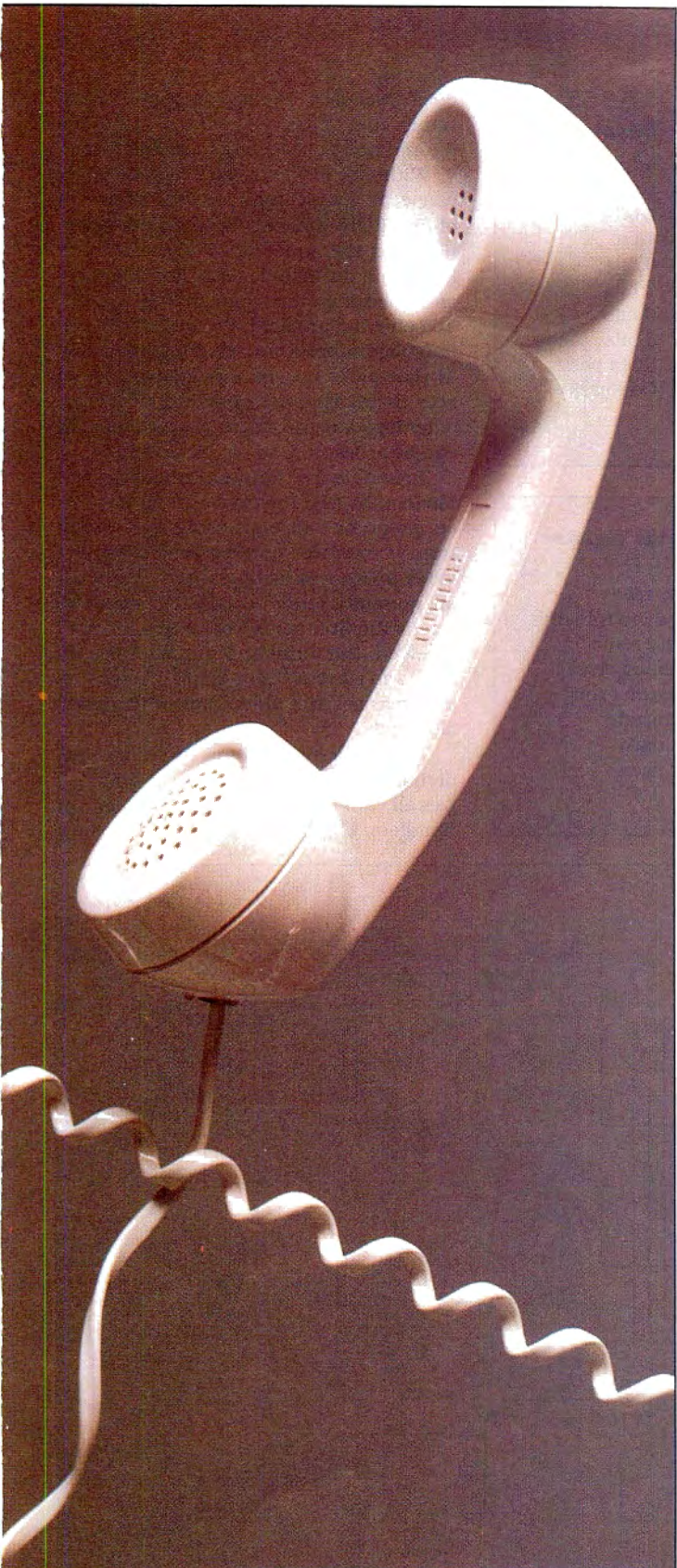
To buy your CompuServe Subscription Kit, see your nearest computer dealer. Suggested retail price is \$39.95. To receive our free brochure, or to order direct, call 800-848-8199 (in Ohio, call 614-457-0802). If you're already a CompuServe subscriber, just type GO TANDYNET at any ! prompt and see what you've been missing.

## CompuServe®

Information Services, P.O. Box 20212  
5000 Arlington Centre Blvd., Columbus, Ohio 43220  
**800-848-8199**  
In Ohio, call 614-457-0802  
An H&R Block Company  
Circle 78 on Reader Service card.







---

### System Requirements

Model 100 or 102  
Model I, III, 4, 1000,  
1200, 2000, or 3000  
Basic

---

# The <sup>m</sup> Model 100

Turn your Model 100 into a modem  
for use with any computer.

by Jeff Holtzman

**W**hen my homemade, acoustically coupled modem went on the fritz, I figured I had two choices: fix it or buy a new one. Fixing it didn't seem worthwhile, but buying a new 300-baud modem wasn't an appealing alternative. I remained in a quandary until I realized that my Radio Shack Model 100 had a modem and serial port built right into it. Why not use the portable computer as a modem for my desktop computer?

I soon realized I couldn't create a modem using just the Model 100's built-in hardware. By writing some new software and adding a simple circuit, however, I eventually succeeded. The software requires less than 2K of RAM, and the circuit I added can be put together for about \$30. For those of you who own a Model 100 or 102 and want an inexpensive means of adding modem capabilities to your desktop system, I'll describe the procedures that allowed me to build my communications peripheral (see the Photo).

### Around the Circuit

Because they're multiplexed through the same UART (universal asynchronous receiver/transmitter), the modem and the serial port cannot be used at the same time. A separate serial port is required. Fortunately, adding one is easy. Figure 1 is a schematic of the circuit I constructed. According to the *Model 100 Technical Reference Manual*, the Model 100's input/output (I/O) decoding scheme leaves the lower 128 ports free. My circuit decodes the lowest of those port addresses.

Here's how it works. Signals from the Model 100's system-expansion socket are transferred to the serial adapter via a 40-conductor ribbon cable. There, IC3 (74HC138), in conjunction with IC4 (74HC32) and IC5 (74HC02), decodes the desired I/O ports. I assigned port zero as the UART's data register, port 1 as its control register, and port 2 as its status register. Actually, IC3, IC4, and IC5 decode these ports only partially; since bits 3-5 of the I/O bus are ignored, port addresses repeat every 8 hexadecimal (hex) bytes for ports below 40 hex.

The UART's word length, stop bits, and parity are set by its control register. The status port indicates whether a character has been received, whether one can be transmitted, and whether a transmission error has occurred. Table 1 shows what each bit in the control register means; Table 2 shows how each bit of the data, control, and status registers corresponds to each bit of the data bus.

IC6 (ICL7660) generates a -5 volt signal, which operates the RS-232 driver (Q1). Q2, in conjunction with diode D1, clips the incoming RS-232 signal to a level that is appropriate for the UART.

### Timely Interrupts

Basic makes it easy to deal with I/O, whether to a RAM file, cassette tape, the modem, or the serial port. However, any time a

Photograph by Ed Justice

| Function             | Value | Meaning        |
|----------------------|-------|----------------|
| Parity inhibit       | 1     | Inhibit parity |
|                      | 0     | Enable parity  |
| Stop bits            | 1     | 2 bits         |
|                      | 0     | 1 bit          |
| Character length 1/2 | 11    | 8 bits         |
|                      | 01    | 7 bits         |
|                      | 10    | 6 bits         |
|                      | 00    | 5 bits         |
| Parity odd/even      | 1     | Even parity    |
|                      | 0     | Odd parity     |

Table 1. UART control register.

| Data-bus bit number | Data register (port 0) | Control register (port 1) | Status register (port 2) |
|---------------------|------------------------|---------------------------|--------------------------|
| 0                   | 0                      | Parity inhibit            | Data ready               |
| 1                   | 1                      | Stop bits                 | Ready to transmit        |
| 2                   | 2                      | Char. length 2            | Parity error             |
| 3                   | 3                      | Char. length 1            | Framing error            |
| 4                   | 4                      | Parity odd/even           | Overrun error            |
| 5                   | 5                      | Not used                  | Not used                 |
| 6                   | 6                      | Not used                  | Not used                 |
| 7                   | 7                      | Not used                  | Not used                 |

Table 2. Port and bit assignments.

device sends a 1A hex character, Basic thinks that it has reached the end of the file and won't accept any more characters.

With text files, this isn't a problem because 1A hex is commonly used as an end-of-file (EOF) marker. However, program files and the squeezed files common on BBSes might include a 1A hex character as something other than an EOF marker. To solve the problem, I wrote a machine-language subroutine (see Program Listing 1) that picks up characters before Basic sees them. The routine stores each character it picks up in a memory location that can be accessed by a PEEK statement.

To handle the communications, I wrote Modem.BA (see Program Listing 2), a Basic program that dials a number chosen from a menu or entered manually; provides a two-way data transfer, including all nonalphanumeric ASCII characters; tracks the number of characters sent and received, the number of transmission errors, and start and stop times of a session; and releases the phone line when a session ends.

The program contains three independent modules. The first (see Fig. 2) initializes all variables and enables the interrupt handlers. (Table 3 lists subroutine entry

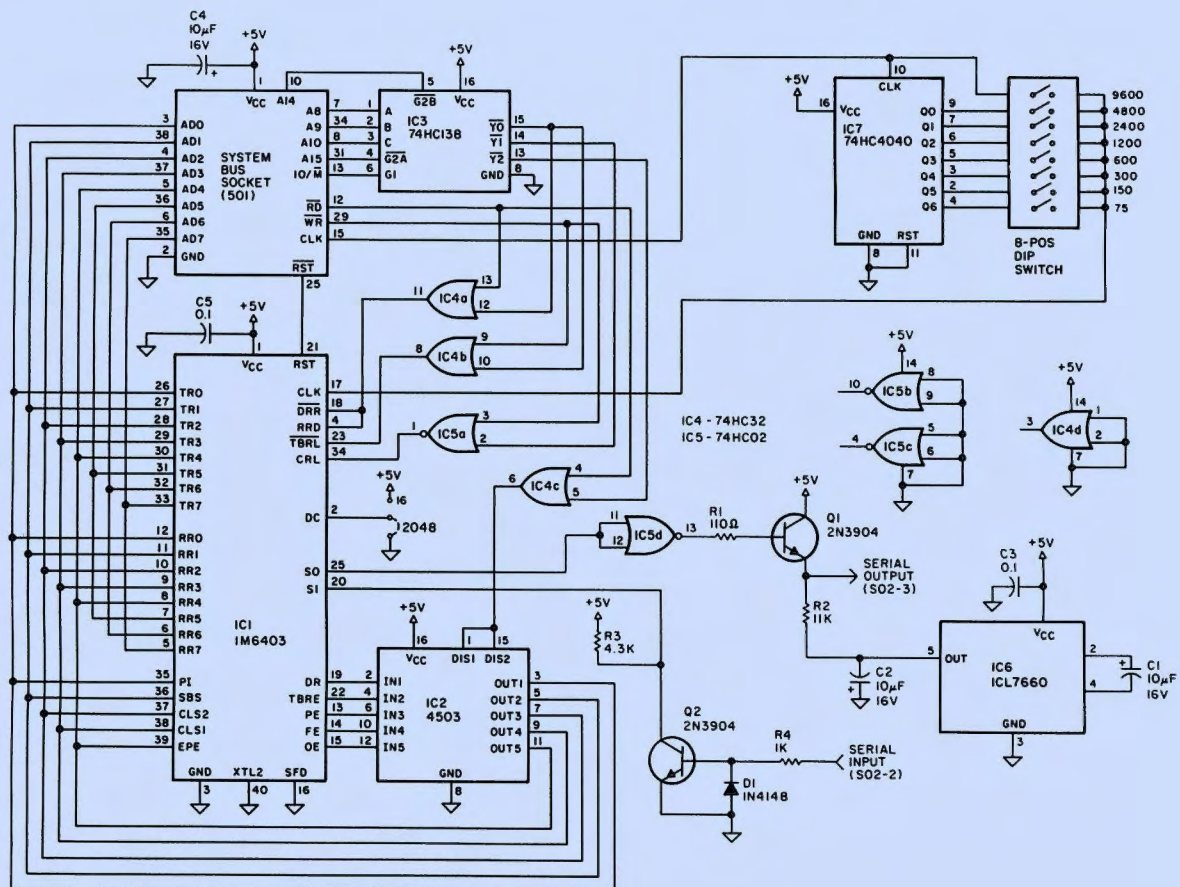
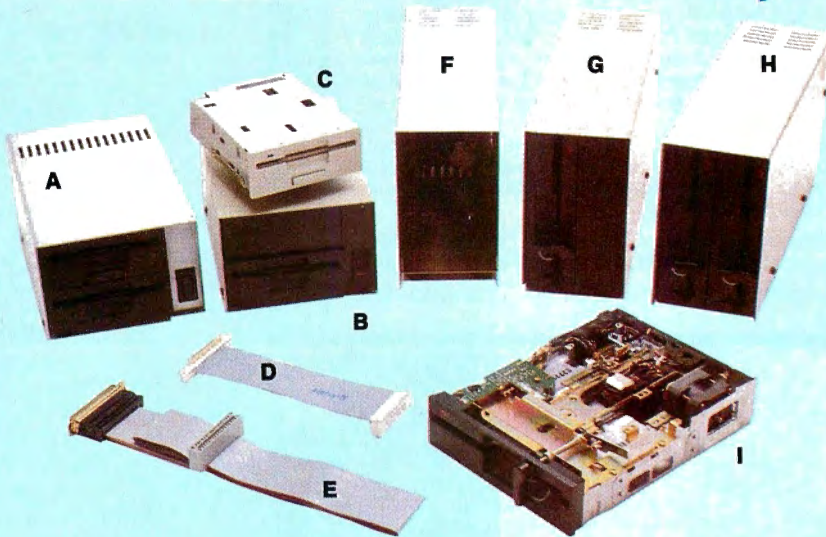


Figure 1. Main schematic of Model 100 serial adapter.



# NEW FLOPPY DISK DRIVES For Mod 1-3-4-1000, IBM

- A. 2-40k DS 3.5" TEAC ..... \$259
- 8-80k DS 3.5" TEAC ..... 289
- B. 1-40k DS 3.5" TEAC ..... 159
- 1-80k DS 3.5" TEAC ..... 179
- Add \$13 for Stainless Steel
- C. Bare 40k DS 3.5" TEAC ..... 109
- Bare 80k DS 3.5" TEAC ..... 129
- D. Extender cable w/gold ..... 10
- E. IBM 1-3-4 external cables
- 2-drive cable ..... 24
- 4-drive cable ..... 34
- Disk Operating Systems
- M1 TRSDOS 2.3 complete ..... 25
- M3 TRSDOS 1.3 complete ..... 25
- M4 TRSDOS 6.2 complete ..... 35
- LDOS (specify M1 or M3) ..... 45
- Montezuma CP/M for M4 ..... 159



- F. 5.25" Power supply ..... \$ 59
- G. 1-40k SS 5.25" TEAC ..... 129
- 1-40k DS 5.25" TEAC ..... 139
- 1-80k DS 5.25" TEAC ..... 169
- H. 2-40k SS 5.25" TEAC ..... 219
- 2-40th DS 5.25" TEAC ..... 259
- 2-80k DS 5.25" TEAC ..... 299
- Add \$17 for Stainless Steel
- I. Bare 40k SS 5.25" TEAC ..... 99
- Bare 40k DS 5.25" TEAC ..... 109
- Bare 80k DS 5.25" TEAC ..... 139
- Bare 40k SS TM100-1 ..... 109
- Bare SS 8" TM848-1E ..... 260
- Bare DS 8" TM848-2E ..... 335
- TEAC FD55A/B/F Ser. Man ..... 20
- TM100-1/2 Service Manual ..... 20
- TM848-1/2 Service Manual ..... 20

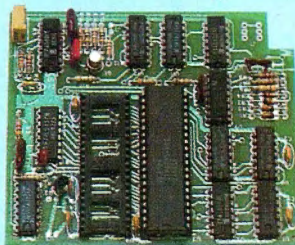
Aerocomp continues to lead the way to the BEST value in disk drives and related peripheral products for your computer. Sound engineering, high performance, quality construction, no-risk free trial, outstanding warranty service and a reputation for doing the right thing make your decision to buy AEROCOMP the correct one. Please look over our selection and call our toll-free order number with your selection now. If you are not sure of

what you need just call our technical assistance number and we'll help you out. All drives are new—not factory blembs, seconds, closeouts or defunct manufacturers surplus (MPI, Qume, Shugart, etc). Instruction manuals are included at no extra cost and service manuals are available. We appreciate your business and will do our very best to support you.

Add \$4 shipping for non-drive items; \$6 for single drives; \$10 for dual drives.

## INCREASED DISK STORAGE FOR YOUR MODEL I Add 80% more capacity to your disk drives with our Double Density Controller (DDC).

Add double density to your TRS-80 Model I by installing our DDC in your expansion interface. Lets talk about density. The Model I was designed to store data on diskettes in single density. Single density refers to the method used to write data to the disk. Your diskette is organized into tracks and sectors. Early Model I's had 35 track drives while later models, and most aftermarket drives, had 40 tracks. In single density the tracks on the diskette surface are divided into 10 sectors. Each sector contains 256 bytes of data for a total of 2,560 bytes or 2.5k per track times the number of tracks your drive is capable of addressing. Double density, on the other hand, allows each track to be divided into 18 sectors. As in single density each sector contains 256 bytes but now there are 18 sectors instead of 10 giving a new storage capacity of 4,608 bytes or 4.5k per track. The result is 80% more data in the same space. You may wonder why Radio Shack did not choose to use double density in the beginning. The reason is simple. It costs more money. Double density disk storage techniques were more expensive to implement back then.



Reliable double density operation required a better disk drive than Radio Shack was furnishing in addition to better quality components and diskettes. Therefore, no double density for the Model I. We went to work and came up with a design that allowed

reliable double density operation on the Model I. In fact, our DDC had a higher probability of data recovery than any other disk controller on the market then or since. Our analog design phase lock loop data separator has a wider capture window than the digital types others use. This allows high resolution data centering. Our "DDC" analog circuit allows infinitely variable tuning with optimum attack and settling times. The oft-stated fears of adjustment problems rumored by digital dilettantes have been proved groundless by thousands of satisfied users the world over. The bottom line is state-of-the-art reliability and performance. TRS-80 Model I disk system owners who are ready for reliable double density operation will get 80% more storage per diskette; single and double density operation with far fewer disk I/O errors; single density compatibility; simple plug-in operation. You will need a disk operating system that has the necessary double density software driver. All the popular DOS's (except TRSDOS) have the software driver. We have a special combination offer that saves you \$10 and includes the LDOS operating system in the event you do not already have a DOS.

- DDC by itself ..... \$ 99
- DDC including the latest version LDOS ..... 139

Please add \$5 shipping

# LOW COST HARD DISK DRIVES FOR YOUR TRS-80



**\$ 495 & up  
COMPLETE  
5 Megabyte  
Primary  
Add a Secondary  
for only  
\$395**

Add \$20 shipping \$395 Add \$30 for Stainless Steel



**STAINLESS  
STEEL!**

Our hard disk systems provide you with the latest integrated designs, proper controllers and pre-tested drives to ensure no unwelcome surprises. Our systems are engineered to provide years of trouble free service. These systems come complete ready to go to work. There is nothing else to purchase. Your choice of either CP/M, LDOS or TRSDOS software drivers at no charge. Additional drivers may be purchased for \$30.

Each unit is guaranteed for one full year, parts and labor, at no additional cost. We provide the little things that are so important to a long troublefree life. Things like state-

of-the-art continuous duty switching power supplies; buffered seek drives; plated media; filtered forced-air ventilation for cool operation and extended life; power line EMI filter; solid steel construction; gold plated connectors; front panel LED indicators for Power—Ready—Select—Read—Write; built-in diagnostics; automatic error correction; provision to add a secondary drive; plus attention to details and a dedication to provide quality service that is unequalled. We are so sure you will be satisfied that we offer a 14 day

free trial. If you are unhappy with your hard drive, for any reason, just let us know within 14 days of your receipt and we will promptly refund your purchase price (less shipping). You can't go wrong. Start enjoying the real power and speed of your computer with one of our hard disk drives. Do it today! Use our toll-free ordering lines now.

## ADDITIONAL SIZES AVAILABLE

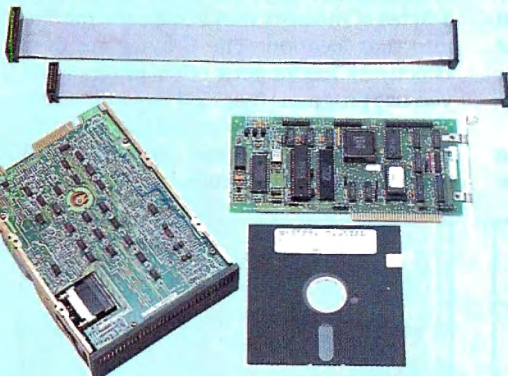
|             | PRIMARY | SECONDARY |
|-------------|---------|-----------|
| 10 Megabyte | \$699   | \$599     |
| 20 Megabyte | 849     | 749       |
| 30 Megabyte | 999     | 899       |

## SAVE YOUR MONEY WITH OUR NEW INTERNAL HARD DISK DRIVES

When you shop and compare hard disk drives for your Tandy 1000 or IBM you will find the best values here. Our hard drive specialists put together a hard disk system that you can count on to give you years of dependable service.

These systems allow you to boot directly from the hard drive. The controller automatically goes into a self test diagnostics mode at power up that verifies optimum system performance. The latest in error checking and correction is built-in allowing extremely reliable handling of your data. Our installation kit comes complete with everything you need to install it into your computer. Complete illustrated instructions as well as all cables and software needed are included. All connectors and card edges are gold plated and keyed so correct assembly is assured with no possibility of damage to your computer, the controller or hard disk drive. These kits are warranted for one year including parts and labor. Our half-high drives have low power requirements making it unnecessary to modify or change your factory power supply. Model 1000 computers require a memory board (Tandy or other) with DMA. Use your standard PC or MS-DOS version 2.1 or later.

We promise your satisfaction with a 14 day money back guarantee. If, for any reason, you are unhappy with your hard drive just let us know within 14 days of receipt and we will arrange the return and a full refund of your purchase price (less shipping). Why wait? Call us now toll-free.

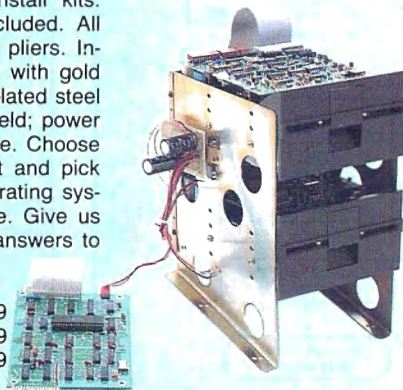


20 Megabyte ..... \$ 549  
30 Megabyte ..... 749  
Add \$10 shipping

## ADD DISK DRIVES TO YOUR MODEL 3/4

Convert your cassette Model 3 or 4 to disk operation with one of our easy to install kits. Detailed illustrated instructions are included. All you need is a screwdriver and pair of pliers. Included is our own advanced controller with gold contacts capable of 4-drive operation; plated steel mounting towers complete with RFI shield; power supply plus all the cables and hardware. Choose a 1 or 2 drive system or the basic kit and pick the drives you want and your disk operating system from the list on the opposite page. Give us a call. We are ready to help with the answers to your questions.

Complete system, less drives . . . \$ 159  
1-Drive system . . . . . 259  
2-Drive system . . . . . 349  
Substitute DS drives for only \$10 each.  
Add \$10 shipping.  
Disk Controller Only . . . . . 110  
RS-232 Board complete . . . . . 69 Add \$4 shipping.



**MasterCard** **CALL TOLL-FREE**  
**800-527-3582 USA**  
**800-442-1310 Texas**  
214-339-8324 Information **VISA**  
**AMERICAN EXPRESS**

Have your American Express, MasterCard or Visa ready. We will not charge your card until the day we ship your order. Mail orders are welcome. Money orders are accepted as well as your company and personal checks as long as they are bank printed and have your address and telephone number. We will ship surface COD with no deposit on most items but all COD's require cash or a Cashier's Check on delivery. Texas residents add State Sales Tax. No tax collected on out of state shipments. There is a one year warranty on all hardware items against defects in materials or workmanship. Your satisfaction is guaranteed on all hardware products. If you are not satisfied, for any reason, call us within 14 days of receipt and we will arrange the return of the hardware product and the cheerful refund of your money (less shipping). All original materials must be intact and undamaged as well as the original shipping container. This offer does not apply to software. Defective software will be replaced. No other software warranty applies. Prices and specifications are subject to change without notice.

**AEROCOMP**

Redbird Airport Hangar #8 \* P.O. Box 764246 \* Dallas, Texas 75376  
\* TELEX: 882761 \* FAX: 214-337-4981 \* SERVICE: 214-337-4346  
© 1986 by Aerocomp. All rights reserved.

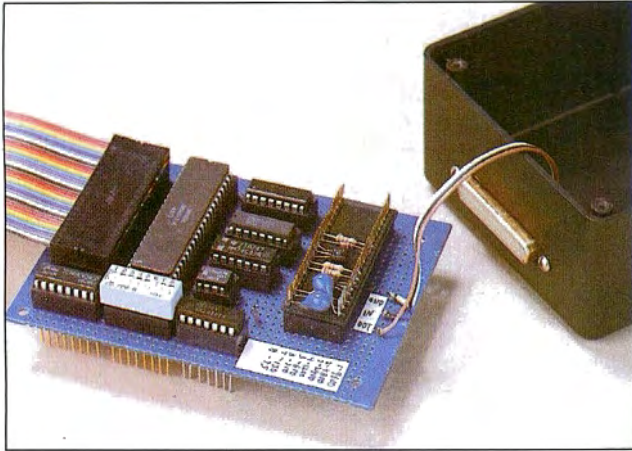


Photo. Serial adapter for the Model 100.

points; Table 4 lists program variables.) It then displays a menu that allows you to dial a number, hang up the phone, halt the program, or enter modem mode. Dialing a number causes the program to fall into modem mode. You can press F8 at any time during a communications session to return to the menu and review the number of characters sent, received, and in error. In addition, you can toggle the carrier-detect sound off and on from the menu. To return to your communications session, just choose option 2 (modem mode).

Modem mode sends the program into a loop that checks for characters from the serial adapter. When it detects a character, the program sends it to the modem using the Model 100 Basic's built-in mo-

dem-handling routines.

The loop can be interrupted through receipt of a character from the modem or by pressing the F8 key. When the modem generates the interrupt (see Fig. 3), the machine-language subroutine retrieves the character and deposits it in the S1! variable. From there, Basic picks it up with a PEEK statement and transmits it through the serial adapter. An interrupt from the keyboard (see Fig. 4) brings the menu on screen; a subsequent keystroke determines what happens next.

One of the program's initialization chores is to make sure that the machine-

language routine is intact in upper memory. If the routine has been corrupted, the program asks if you want to POKE it into memory. If you respond with anything but Y or y, the program ends. If you answer affirmatively, the program reserves 8 bytes of memory and POKES the routine into that location. The 8 bytes are then effectively lost to your other programs. If you use programs that load into high memory, be careful not to wipe out that location. If you do, you could lose an additional 8 bytes every time the program runs.

**Line number Description**

|      |   |
|------|---|
| 10   | Program entry                                   |
| 100  | Main loop                                       |
| 200  | Process modem interrupt                         |
| 300  | Process serial interrupt                        |
| 400  | Initialize variables, interrupts                |
| 600  | Get UART parameters                             |
| 700  | Get modem parameters                            |
| 800  | Process keyboard interrupt                      |
| 1000 | Quit  |
| 1100 | Display statistics                              |
| 1200 | Disconnect phone line                           |
| 1300 | Display/get phone number                        |
| 1700 | Read phone numbers to array                     |
| 1800 | Phone name/number data                          |
| 3000 | Verify integrity of machine-language subroutine |
| 4000 | Data for machine-language subroutine            |
| 5000 | POKE machine-language subroutine into memory    |

Table 3. Basic program subroutines.

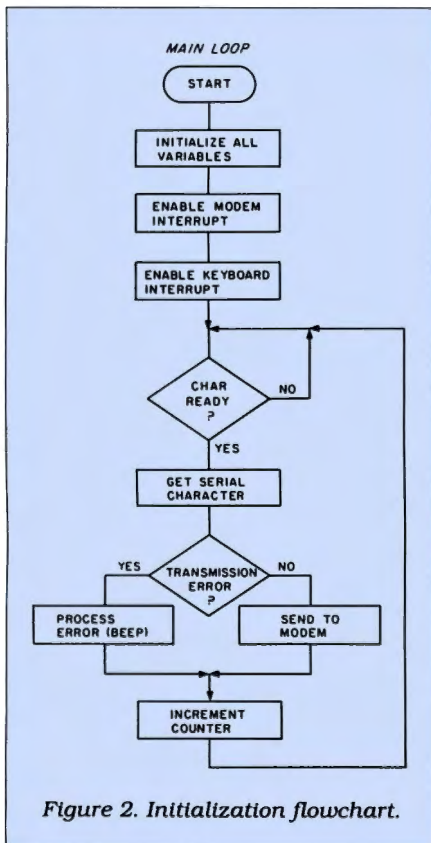


Figure 2. Initialization flowchart.

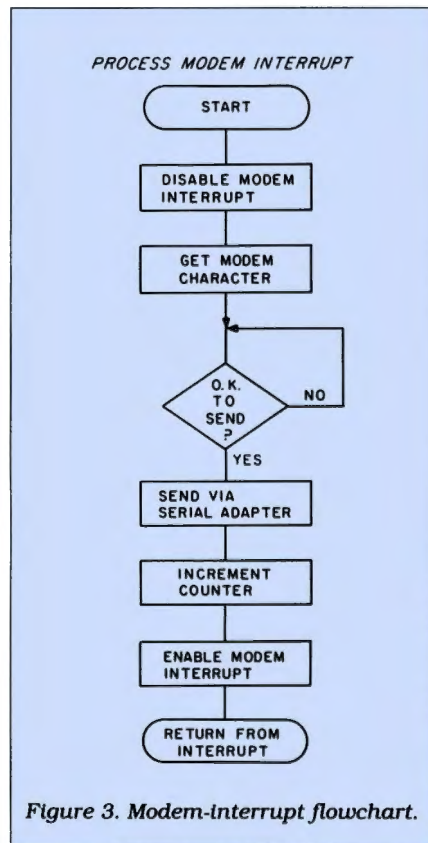


Figure 3. Modem-interrupt flowchart.

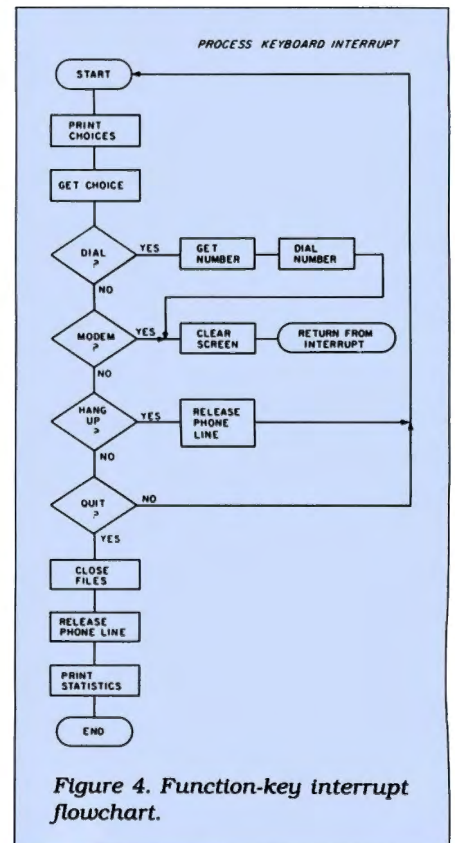


Figure 4. Function-key interrupt flowchart.

| Variable | Description   |
|----------|---|
| C        | Keyboard input character                              |
| ER       | Count of errors from adapter                          |
| I        | General loop counter                                  |
| MC#      | Number of characters received from modem              |
| MD\$     | Modem parameter string                                |
| N        | Number of bytes in machine-language subroutine        |
| N\$      | Number to dial  |
| NO       | Address of pointer to N\$                             |
| N1!      | Address of N\$  |
| S0!      | Address of machine-language subroutine                |
| S1!      | Address of character from machine-language subroutine |
| SC#      | Number of characters received from adapter            |
| SC\$     | Character received from adapter                       |
| TO\$     | Time of start session                                 |
| TL       | Total number of entries in TN\$(2,15)                 |
| TN\$     | Array (2,15) of names/numbers                         |
| U        | UART configuration byte                               |
| X        | Machine-language byte to POKE in memory               |

Note: All untyped variables are integers.

Table 4. Basic program variables.

| Part       | Description  | Distributor | Part number | Price           |
|------------|--|-------------|-------------|-----------------|
| R1         | 110 ohms resistor (.25 watt)                             | Digi-Key    | 110Q        | \$ .25 for five |
| R2         | 11,000 ohms resistor (.25 watt)                          | Digi-Key    | 11KQ        | \$ .25 for five |
| R3         | 4,300 ohms resistor (.25 watt)                           | Digi-Key    | 4.3KQ       | \$ .25 for five |
| R4         | 1,000 ohms resistor (.25 watt)                           | Digi-Key    | 1.0KQ       | \$ .25 for five |
| C1, C2, C4 | 10 $\mu$ F, 16V, tantalum capacitor                      | Digi-Key    | P2038       | \$ .61 each     |
| C3, C5     | 0.1 $\mu$ F monolithic capacitor                         | Radio Shack | 272-1069    | \$ .79 each     |
| IC1        | CMOS UART semiconductor                                  | JDR         | ICM6403     | \$9.95          |
| IC2        | CMOS three-state, non-inverting hex buffer semiconductor | JDR         | CD4503      | \$ .49          |
| IC3        | CMOS 3-to-8 line decoder semiconductor                   | JDR         | 74HC138     | \$ .99          |
| IC4        | CMOS OR gate semiconductor                               | JDR         | 74HC32      | \$ .69          |
| IC5        | CMOS NAND gate semiconductor                             | JDR         | 74HC02      | \$ .59          |
| IC6        | CMOS voltage inverter semiconductor                      | JDR         | ICL7660     | \$2.95          |
| IC7        | 12-stage binary divider semiconductor                    | Jameco      | 74HC4040    | \$1.19          |
| Q1, Q2     | NPN transistor semiconductor                             | Digi-Key    | 2N3904      | \$ .23          |
| D1         | Diode semiconductor                                      | Digi-Key    | 1N4148      | \$ .60 for 10   |
| S01        | 40-pin DIP socket  |             |             |                 |
| S02        | 25-pin D connector                                       |             |             |                 |
| CBL1       | 40-conductor DIP-plug cable                              | Digi-Key    | R140-12-ND  | \$6.81          |
| None       | 40-pin DIP header  |             |             |                 |
| S1         | 8-position DIP switch                                    |             |             |                 |

Digi-Key Corp., P.O. Box 677, Thief River Falls, MN 56701, 800-344-4539  
 Jameco Electronics, 1355 Shoreway Road, Belmont, CA 94002, 415-592-8097  
 JDR Microdevices, 1224 S. Bascom Ave., San Jose, CA 95128, 800-538-5000  
 Radio Shack National Products Div., 900 E. Northside Drive, Fort Worth, TX 76102, 817-870-5662

Table 5. Parts list.

If this is a problem, a solution might be to free up the memory in the Quit subroutine that begins at line 1000. However, if you don't actually use the Quit subroutine to exit (for example, by pressing shift-break), the memory would still be lost.

## Construction Work

I built my modem on perfboard using wire-wrap techniques. (See Table 5 for a complete parts list.) All ICs are socketed, and all discrete components, except the bypass capacitors (C3, C4, and C5), are soldered to a 40-pin dual in-line package (DIP) header that plugs into a 40-pin DIP socket. The bypass capacitors are soldered to the pins of the appropriate sockets. The circuit mounts in a small plastic box with a metal lid. A slot filed in the edge of the metal cover allows the 40-conductor ribbon cable to exit; a hole cut in the side of the case allows the 25-pin D connector to protrude.

Check your work carefully after completing all wiring, since one mistake could damage your computer. Save files that you don't want to lose and turn off the main power switch. Remove the panel that covers the system bus socket; then connect a 40-conductor cable to the system bus socket on one end and your adapter on the other. (See Fig. 5.) Pin 1 of the plug should go to pin 1 of the socket on both ends. I found that a 12-inch length of ribbon cable hardly affected bus-signal rise-times, although the peak level of the clock signal barely exceeds 3 volts (which is within normal CMOS specifications).

Because the Tandy 102's system bus has a different location from the 100's and uses a different socket, you must replace the 40-conductor DIP-plug cable (CBL1) with Digi-Key's part number R240-ND (\$4.57) and purchase two R306-ND sockets (\$2.55 each), also from Digi-Key.

To construct the connection between the Tandy 102 and the serial adapter, you must clamp the two R306 sockets onto the ends of a piece of 40-conductor ribbon cable. One end of the newly constructed cable goes to the system bus of the 102; the other end goes to the new R240 cable. The free end of the R240 connects to the serial adapter.

At this point, you must connect the adapter to your desktop computer's serial port. Whichever pins you use, make sure that inputs go to outputs, and vice versa, and that a common ground is established. The connections my system required are shown in Fig. 5. Your computer could require different connections, so be sure to check your system documentation.

Last, set the baud rate using the 8-position DIP switch. You'll have to limit the baud rate to 300 unless you plan only to download (not upload) files. The restriction is due to the speed with which Basic handles communications.

# Tandy 1000 Memory Card

another high quality product from Southwestern Digital

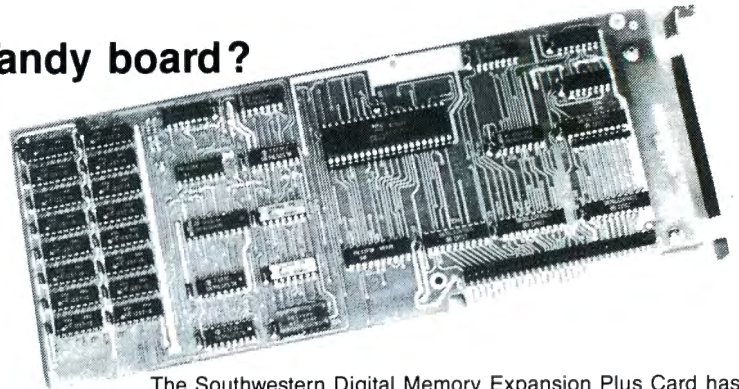
## Why spend a bundle on a Tandy board?

## Our Board is only

# \$135.

**Features:**

- 512K of Memory
- DMA
- Expansion Port
- Gold Edge Cards
- Easy Installation
- 30 Day Satisfaction Guarantee Policy



The Southwestern Digital Memory Expansion Plus Card has all the features of the Radio Shack Board but the price; you save almost \$400. Features include 512K installed, burned in, and tested to give you a total of 640K, a DMA circuit that is fully tested for hard drive operation, and an expansion port that will work with any of the Radio Shack Memory Plus Expansion Card options. High quality manufacturing, and features such as gold plated card edges make this the logical choice in upgrading your memory.

## Tandy 1000 Add on Boards Serial, Clock, or Both

The Southwestern Digital new Add-On boards were developed for use with the Plus Card Port, ( a piggy-back type, add on port established by Tandy to eliminate the need for an additional card slot ). These cards are fully compatible with the Memory Expansion Plus Card from Southwestern Digital and the Memory Expansion Plus Board from Tandy.

### RS232C PLUS Option Board

Mounts on a PLUS expansion board, and features selectivity between COM Port 1 and COM Port 2. The RS232C output connector is the standard Tandy female DB25, and is fully compatible with the Tandy output. \$85.

### Clock/Calendar PLUS Option Board

Mounts on a Plus expansion board, and features selectivity between two ports so that you can run two clocks at one time. The Clock Calendar Board gives you perpetual time/date so that you don't have to re-input time and date into your application programs as part of your power up routine. \$85.

### RS232C-Clock/Calendar PLUS Option Board

Features options of both of the above boards on just one board. \$170.

#### Save on the Combination

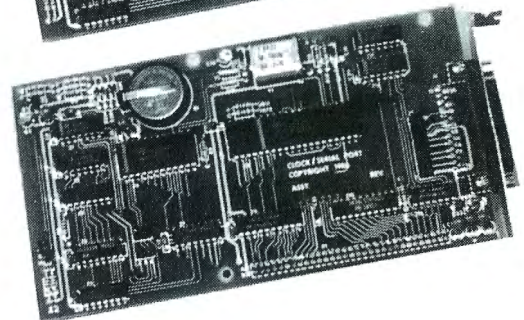
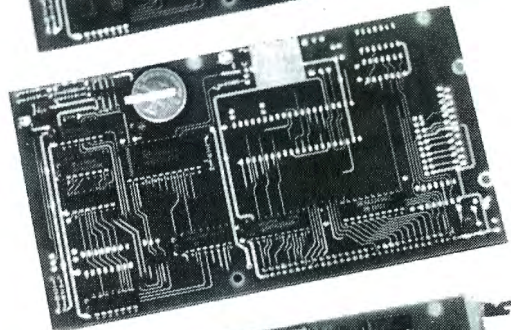
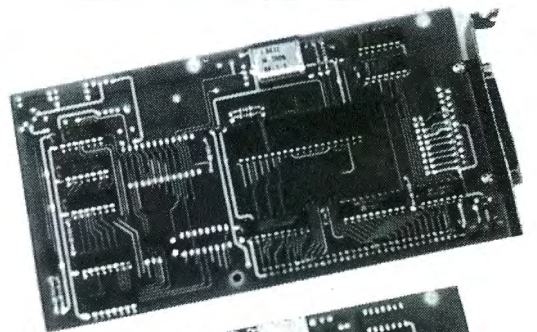
512K, RS232C-Serial Port, and Clock ..... \$245.  
(Includes RAM DISK and PRINTER SPOOLER)

## NEW!

20 Megabyte Tandy 1000 HARD DRIVE ..... \$550.  
(for use with 1 or 2 Disk Drives)

### Tandy 1000 Computer System

Tandy 1000 with 640K, RS232 Serial Port, Clock/Calendar, and a 20 Meg Hard Drive ..... \$1450.



#### Order Line

1-713-480-3296

### Southwestern Digital

2515 West Main Street, Suite #337  
Houston, Texas 77098

#### Ordering Information

Call us or mail your order in. We accept Visa, Mastercard, and Certified Funds for quickest shipment. Personal checks are held for clearance. Add \$5 for ground shipment, or \$10 for UPS 2nd day air service. All products carry a 30 day satisfaction guarantee, and are warranted for a full year.



Apply power, keeping an eye on the screen and the low-battery indicator. If either looks abnormal, quickly remove power and check your wiring carefully. When the wiring is correct, type in the program and run it.

## Using the Adapter

The first time the program runs, it will ask whether it should POKE the machine-language routine into memory. Answer Y or y. Now you're ready to start communicating.

When you choose to dial a number, a menu appears on screen. You can enter a menu selection or type in a telephone number. The Model 100 dials the number for you and falls into modem mode when it detects a carrier. The screen goes blank and displays a message reminding you that you can return to the menu at any time by pressing F8. At this point, you're free to use your desktop computer's regular telecommunications software. Meanwhile, Modem.BA will track characters sent and received, transmission errors, and connect time.

The sample data in lines 1800-1940 of Modem.BA are numbers that I call frequently. Simply change the Data statements to reflect the numbers you call most frequently.

I've found no way of determining whether a carrier has been detected other than by listening to the tones emitted by the Model 100. If a phone is answered but no carrier is detected, the program locks up. When this happens, your only recourse is to press shift-break and then run the program again.

Another potential problem exists with the hardware. The transistor Q1 provides a voltage swing between -1.5 and 5.0 volts. The RS-232 standard requires a minimum swing of +/- 3 volts. However, I've tested several 1489 line-receiver ICs, and all of them tolerate those voltage levels. But, I wouldn't recommend using my circuit to drive cables more than about 10 feet long. If you detect output problems, you could use one section of a 1488 line-driver IC, in which case IC5-d wouldn't be needed. Connect the input of the 1488 directly to the output of the UART (pin 25). However, doing this will cause the circuit's current drain to increase from under 2 milliamp (mA) to about 20 mA—a tenfold increase in power consumption.

As you can see, for a small investment in time and components, you can use your portable computer as an intelligent modem. The software is simple and easily enhanced to automatically log onto your favorite BBS or to emulate a Hayes or any other kind of modem. ■

Jeff Holtzman is a technical editor with Radio-Electronics magazine. You can write to him at 30-59 43rd St., Astoria, NY 11103.

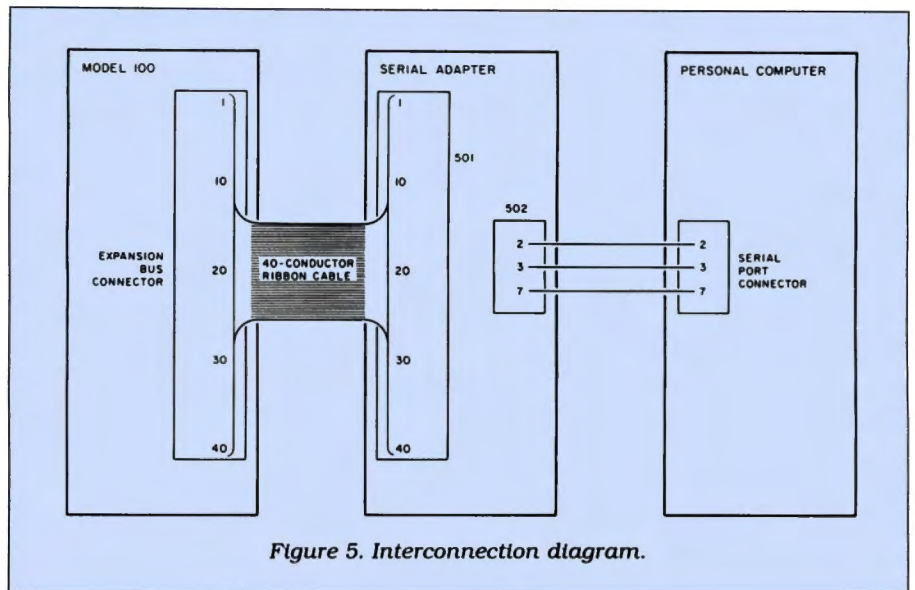


Figure 5. Interconnection diagram.

### Program Listing 1. Subroutine to pick up characters before Basic sees them.

```

PUSH      H      ; has address of S11
CALL     6D7E   ; gets char from RS-232 queue
POP      B      ; index from B register
STAX    B      ; put the char
RET      ; that's it

```

### Program Listing 2. Modem.BA.

```

10 'modem.ba/jh/2-9-86/v2.0
15 'for 80 Micro 6/1/86
20 MAXFILES=2: CLEAR500: GOSUB400
100 IF (INP(2) AND 1) = 1 THEN GOSUB300
110 GOTO100
200 MDMSTOP'--*
210 CALLS01,0,S11
230 IF ((INP(2) AND 2) <> 2) THEN 230
250 OUT0,PEEK(S11):MC#=MC#+
1:MDMON:RETURN
300 MDMSTOP'--*
320 SC$=CHR$(INP(0)):IF (INP(2)/4 AND 7) <>
0 THEN SC$="**":BEEP:ER=ER+1
340 PRINT#2,SC$;SC#=SC#+1:MDMON:RETURN
400 DEFINTA-Z'--*
405 DIMTNS(2,15):GOSUB 1200
410 T0$=TIME$:MC#=0:SC#=0:ER=0
460 GOSUB600:OUT1,U
480 GOSUB700:ONMDMGOSUB200
500 ONKEYGOSUB,,,,,800
520 MDMOPF:KEYON
530 GOSUB3000:GOSUB1700:GOSUB800
599 RETURN
600 U=13'no parity, 1 stop, 8 data
610 RETURN
700 MD$="MDM:8N1D'9800,nopar,1stop
710 RETURN
800 MDM STOP'--*
820 CLS
830 PRINT
840 PRINT#1,Dial a number 5. Stats
842 PRINT#2,Modem mode 6. Sound
844 PRINT#3,Hang up phone
846 PRINT#4,Quit
848 PRINT#5,Choose: ";
850 C=VAL(INPUT$(1)):IFC<
1 THEN 800 ELSE PRINT
860 IFC=1 THEN GOSUB1300:IFLEN(NS)>
0 THEN C=2 ELSE 820
865 IFC=3 THEN GOSUB1200:GOTO820
870 IFC=4 THEN GOTO1000
875 IFC=5 THEN GOSUB1100:GOTO820
877 IFC=6 THEN GOSUB1600:GOTO820
880 IFC>2 THEN 820
900 CLS:PRINT#5,Press F8 to return to
menu.:MDMON:RETURN
1000 MDMOPF:KEYOFF:GOSUB1200'--*
1010 GOSUB1100:END
1100 CLS:PRINT#5,Serial chars rc'd:;SC#
1120 PRINT#5,Modem chars rc'd:;MC#
1130 PRINT#5,No. serial errors:;ER
1140 PRINT#5,Start time:;T0$
1150 PRINT#5,Current time:;TIME$
1160 X$=INPUT$(1):RETURN
1200 CALL21179:CLOSE:RETURN'--*
1300 CLS'--*
1330 FORI=1TOTL:PRINTI;TNS(1,I);TAB(20);
1350 IFIMOD2=0 THEN PRINT
1360 NEXT
1370 PRINT#5;NS="
1410 INPUT#5,Choose or enter number:;NS
1420 IFLEN(NS)=0 THEN RETURN
1430 IFVAL(NS)>TL THEN 1450
1440 NS=TNS(2,VAL(NS))+CHR$(0)
1460 CALL21200:N0=VARPTR(NS)
1480 N1=PEEK(N0+1)+256*PEEK(N0+2)
1490 CALL21293,0,N1'dial number
1500 OPENMD$FORINPUTAS1
1510 OPENMD$FOROUTPUTAS2
1530 RETURN
1600 PRINT#5/N
";:GOSUB3200:IFC=89 THEN SOUND ELSE SOUND0
FF
1610 RETURN
1700 RESTORE1800:READTL'--*
1740 FORI=1TOTL:READTNS(1,I):READTNS(2,I
);NEXT
1780 RETURN
1800 DATA10
1850 DATA LICA,15165616590
1860 DATA CURA/Kaypro,6249148
1870 DATA CURA/IBM-PC,6249141
1880 DATA CURA/CPM,6255931
1890 DATA APC magazine,12126960360
1900 DATA 80 Micro,16039246985
1910 DATA NJ R/CPM,12017980065
1920 DATA Unused,12125551212
1930 DATA Unused,12125551212
1940 DATA Unused,12125551212
3000 'chk/poke ml routine
3010 RESTORE4000:READN:I=0:
3020 READX
3030 IFX<>PEEK(HIMEM+I) THEN 3100
3040 I=I+1:IFC<N THEN 3020
3070 S0=HIMEM:S1=HIMEM+N
3090 RETURN
3100 PRINT#5,ML routine is corrupt
3110 PRINT#5,Poke into memory (y/n) ? ";
3120 GOSUB3200:IFC=89 THEN RUN500 ELSE SEND
3200 C=ASC(INPUT$(1)):C=C AND 223:RETURN
4000 DATA 7,229,205,126,109,193,2,201
5000 RESTORE4000:READN
5010 CLEAR500,HIMEM-N-1
5020 RESTORE4000:READN
5030 FORI=0TOTN-1:READC:POKEHIMEM+
I,C:NEXT
5060 RUN
9999 END

```

End

# Move It!

You don't need hi-res  
to add life to Model 4 graphics.

It is somewhere between tedious and impossible to display graphics and manipulate blocks of text with Model 4 Disk Basic. With the exception of the Print CHR\$( ) statement, all video input/output must be handled by TRSDOS through machine-language supervisory calls.

To get around these limitations, I've written a series of machine-language subroutines that simulate the handy graphics routines found in GBasic, the Basic sub-language from Micro-Labs Inc. The first of these subroutines, Drawstring (see "A Quick Draw," April 1986, p. 54), provides the equivalent of GBasic's Draw routine; this month I've added the GET. and PUT. routines in a program called Framer.

GET. and PUT. provide a convenient way to store and retrieve rectangular areas of the video screen. After placing an invisible frame around a rectangle of screen information, you can use the GET. command to store it in a special memory area and PUT. to place it anywhere on the screen.

Framer lets you spice up Basic programs with windows, pull-down menus, vertical- and horizontal-scrolling text, and animated graphics sequences. By using the GET. and PUT. routines alternately, you can flip between screens, create split screens, and perform a wide variety of video tricks.

## Framework

Enter Framer and save it to disk before proceeding (Program Listing 1; the source code is available through 80 Micro's Load 80 service [p. 6]). You must also remove filters or drivers residing between your Basic program and FFFF hexadecimal (hex) and relocate them to low memory using the TRSDOS Memory command. Now run Listing 1. The program creates a TRSDOS command file you can load from within Basic programs by inserting SYSTEM "Load Framer/CMD:0" (see line 100 of Program Listing 2).



## System Requirements

Model 4  
TRSDOS 6.x  
Disk Basic

Program Listing 1. Framer. (See p. 112 for information on using the checksums in Listings 1 and 2.)

```

80 CLEAR,64829:PRINT CHR$(15);          ** 1827
90 CLS:CST=0                             ** 764
100 PRINT@240,"Loading FRAMER..";       ** 2230
110 FOR J=&HFD3E TO &HFE8F              ** 1546
120 READ AD:POKE J,AD:CST=CST+AD        ** 2035
130 NEXT                                ** 499
140 IF CST<>40927 THEN PRINT@400,"Data statement error..":STOP ** 4615
150 PRINT@320,"Successful Load..";      ** 2468
160 SYSTEM"DUMP FRAMER/CMD:0 (START=X'FD3E',END=X'FE8F')" ** 2473
170 PRINT CHR$(14);:END                 ** 1384
180 DATA 229,42,148,254,54,0,35,62,253,188,32,248,62 ** 2637
190 DATA 61,189,32,243,225,43,43,78,35,70,35,17,61 ** 2535
200 DATA 253,62,253,18,197,78,35,70,235,237,66,235 ** 2544
210 DATA 43,115,35,114,27,62,253,18,19,35,193,11,175 ** 2619
220 DATA 185,32,232,213,42,148,254,209,235,237,82 ** 2479
230 DATA 250,78,254,201,126,254,24,242,73,254,50,151 ** 2618
240 DATA 254,26,254,80,242,73,254,50,150,254,197,221 ** 2627
250 DATA 225,221,78,0,221,70,1,10,254,24,242,73,254 ** 2554
260 DATA 50,152,254,221,78,2,221,70,3,10,254,80,242 ** 2572
270 DATA 73,254,50,153,254,253,33,150,254,253,126,3 ** 2458
280 DATA 253,150,0,250,73,254,253,126,2,253,150,1 ** 2610
290 DATA 250,73,254,221,110,4,221,102,5,94,35,86,213 ** 2528
300 DATA 253,225,221,33,150,254,221,102,1,221,110,0 ** 2516
310 DATA 6,1,62,15,239,253,119,0,253,35,62,253,253 ** 2678
320 DATA 190,0,202,83,254,58,153,254,189,32,15,58,152 ** 2367
330 DATA 254,188,40,12,253,54,0,13,253,35,36,24 ** 2702
340 DATA 214,44,24,214,253,54,0,254,201,126,50,151,254 ** 2594
350 DATA 26,50,150,254,197,221,225,221,110,0,221,102 ** 2546
360 DATA 1,229,253,225,221,33,150,254,221,102,1,221 ** 2365
370 DATA 110,0,62,15,6,2,253,78,0,239,44,253,35 ** 2602
380 DATA 62,254,253,190,0,200,62,13,253,190,0,32,232 ** 2416
390 DATA 253,35,36,24,224,33,101,254,24,8,33,114 ** 2611
400 DATA 254,24,3,33,124,254,62,105,239,62,10,239,33 ** 2446
410 DATA 134,254,62,10,239,195,59,89,42,80,65,82 ** 2521
420 DATA 65,77,69,84,69,82,83,42,3,42,77,69,77,83 ** 2367
430 DATA 73,90,69,42,3,42,79,86,69,82,82,85,78 ** 2206
440 DATA 42,3,32,82,101,97,100,121,9,62,14,3 ** 224
450 ' ** 154
460 ' ***** ** 155
470 ' * NOTE 1: MODEL 4 BASIC VERSION 01.00.00 USERS * ** 156
480 ' * MUST CHANGE THE VALUE OF THE 7TH AND 8TH * ** 157
490 ' * DATA BYTES IN LINE 410 TO READ: 248,99, * ** 149
500 ' * CHANGE 40927 TO 41126 IN LINE 140 * ** 150
510 ' * ** 151
520 ' * NOTE 2: TRSDOS 6.0/6.1 USERS MUST CHANGE THE * ** 152
530 ' * VALUE OF THE 7TH,8TH AND 9TH DATA BYTES * ** 153
540 ' * IN LINE 400 TO READ: 0,0,0, * ** 154
550 ' * CHANGE 40927 TO 40521 IN LINE 140 * ** 155
560 ' * ** 156
570 ' * NOTE 3: IF BOTH ABOVE CHANGES ARE MADE, * ** 157
580 ' * CHANGE 40927 TO 40720 IN LINE 140 * ** 158
590 ' ***** **

```

End

Run the demonstration in Listing 2 to get a feel for how Framer operates. You must include the equivalent of lines 60-180 in any program that includes the Framer subroutines; of these, lines 60-90 must be in the order shown. I'll explain what the statements in these crucial lines do and how you can modify them for your own applications.

The statement A = 64829!-nnnnn in line 60 tells the Initial subroutine to protect memory from the highest buffer address (64829) to the lowest buffer address (64829-nnnnn). Here, nnnnn is the size of all frame buffers combined, which you must assign before starting your program.

Line 130 is where you set the sizes of the individual buffers to be totaled.

Line 70 loads a 2-byte pointer with the value of the variable A, and the Initial subroutine (line 180) uses this value to make sure you've reserved enough memory for frames. You'll get a memory-size error message if nnnnn contains too small a value to protect the frames from being overwritten by Basic. The CLEAR,A statement in line 90 reserves the buffer space.

Line 100 loads the Framer/CMD file created by Listing 1 into the protected memory area and returns control to your Basic program.

Line 110 tells the Initial subroutine

Circle 261 on Reader Service card.

**ACTUAL SIZE.**

## MICROLITE CORPORATION PRESENTS THE BEST FOR XENIX

A complete hardware and software line designed to increase the productivity of your **TANDY 6000**, including...

- Desktop Publishing
- Presentation Graphics
- Project Scheduling
- Communications
- High Capacity Hard Disk Upgrades
- Laser Printers
- Color Plotters
- Ergonomic Terminals
- High Speed Modems

And more! Write today for our full line brochure and find out how you can enhance the capabilities of your **Tandy 6000!**

Microlite Corporation  
Department 80M986  
1021 Sutherland Street  
Pittsburgh, PA 15204

Please send your full-line brochure for...

- Tandy 6000 Products  
 Other Unix/Xenix Products

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

Telephone \_\_\_\_\_

Ext. \_\_\_\_\_

System Configuration \_\_\_\_\_

Most products also available for other Unix/Xenix Systems. Tandy 6000 is a trademark of Tandy Corporation. Unix is a trademark of AT&T Bell Laboratories. XENIX is a trademark of Microsoft Corporation.

**MICROLITE**

(412) 771-4901

Circle 346 on Reader Service card.

**ACTUAL PRICE.**

Introducing The Turner Hall™ Card. The lowest priced complete 256K memory expansion board you can buy.

We made it so inexpensive by using the very latest 256K RAM chips instead of four times as many 64K chips.

That same technology makes the Card fit in a half-length PC/XT™ slot. And the reduced chip count increases reliability, so we can offer a 30-day money-back guarantee and 1-year warranty.

The Card comes with a clock/calendar with replaceable battery backup, illustrated Owner's Manual, and software including clock, print spooler, and disk emulator.

That's everything the most popular

multifunction boards have. Except a couple of extra ports and a lot of extra cost.

IBM® or Compaq® owners will find the Card remarkably easy to install. And if you have any questions after you buy, call our Help Hotline.

The Turner Hall Card is just \$99.95,\* plus \$2.00 shipping (\$12.00 outside of U.S.A.).

Order by phone. We accept MasterCard or Visa. Or send us a check or money order with your business card attached.

**Turner Hall Publishing**  
10201 Torre Ave., Cupertino, CA 95014

**1-800-556-1234 x526.**  
(In CA 800-441-2345 x526).

\*CA residents add 7% sales tax (\$7.00). Requires IBM PC, PC/XT, Portable PC, or Compaq with at least 256K of memory. Turner Hall is a trademark of Turner Hall Publishing. IBM is a registered trademark, and PC/XT is a trademark of International Business Machines Corp. Compaq is a registered trademark of Compaq Computer Corp.

# Battle Stations! Battle Stations!

*A sure-fire arsenal of more than 50 specially selected subroutines designed to help you—pro or beginner—write better Basic programs for the Models I, III and 4!*

Bring your periscope up and focus on NUCLEAR SUBROUTINES, a hot, new collection of the best Model I, III and 4 subroutines ever published in 80 Micro, *many never before published on disk!*

From scrolling to graphics... screen handling to sorting, you'll write the smoothest running programs ever, REGARDLESS OF YOUR LEVEL OF SKILL! Here on this atomic-powered "fippy" disk are literally dozens of the neatest subroutines in every size and shape. Some are in Basic, ready for merging with your own programs. Others are in machine language, to be loaded from DOS and called by Basic. Either way, your Basic programs will never be the same again!

Model I & III programs are on one side, and Model 4 programs on the other. Documentation is right on the disk. Just boot up NUCLEAR SUBROUTINES, and you're set for unparalleled programming power! Space is too tight to list them all, but here's a sampling of what awaits you on this once-in-a-lifetime disk, divided into six major categories:

## MATHEMATICS

Double Precision—Make your Basic programs more accurate with routines that calculate values with up to 16 significant digits.

Calculator—A two line calculator that gives you the four basic math operations in double precision and exponentiation in single precision.

Random Number Generator—Enter fractions as input, which are converted to decimal values for computation, and output as fractions.

**AND MORE!...**

**YES!** I want to get 80 Micro's NUCLEAR SUBROUTINES working on my Model I, III and Model 4 programming projects! Please send my disk at \$21.45 for more than 50 subroutines, specially selected by the programming pros at 80 Micro!

Payment enclosed     AMEX     Visa     MC

Card# \_\_\_\_\_ Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_

Name (print) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**Mail to: LOAD 80 • Elm St. • Peterborough, NH 03458**

Includes postage & handling. Foreign airmail add \$1.90 per item.

Models I, III, and 4 are registered trademarks of Radio Shack, a division of Tandy Corp.

**9-86 51**

## SCROLL

Horizontal Scroll—Scrolls messages horizontally across the screen.

Window Scroll—Reserves a block portion of the screen (the window) in which information can be viewed, moving new information into the window and shuffling the old out.

## SCREEN

Screen Border—Draw a border around your screen.

Screen Locator—Use PEEKs and POKEs to locate screen positions when speed is a necessity.

Screen PRINT—Use the arrow keys to move a nondestructive cursor while each PRINT location is displayed.

Screen Dump—Model I/III graphics screen dump program for an Epson MX-80 with Graftrax Plus or an RX-80.

Screen Fill—Fill the screen in assorted ways to create the effect you desire.

Screen Save and Restore—Save and restore the screen contents whenever you wish.

Screen Invert—Reverse the content of your Model I or III screen.

**AND MORE!...**

## SORTS

VisiCalc Sort—Sort alpha or numeric data in ascending order, and numeric data in descending order.

Model 4 Sort—A lightning-fast string sort for Model 4 Basic that has the feature of Model III Basic's CMD "O".

**PLUS MANY MORE!...**

## GRAPHICS

Upgraded Graphics—Add the Point, Set and Reset commands to Model 4 Basic.

Better Graphics—Run Model I/III Basic graphics up to eight times faster than normal using the LSET and RSET commands.

**AND MANY OTHERS!...**

## GENERAL USE

Input Routine—A user input routine.

Menu Routine—Add some life to your menus with this routine.

Paint Routine—Draw any shape on your Model I or III screen and fill it in with a touch of the space bar.

Sound—Enhanced sound for the Model 4.

Word Processor—A two line word processor.

**PLUS MORE, MORE, MORE!**

Complete the coupon or card and mail today.

Or, for immediate service, **CALL TOLL FREE 1-800-258-5471**

(in NH, dial 1-924-9471) and charge it to your credit card!

Program Listing 2. Demonstration of GET. and PUT. subroutines.

```

10 ' *****
20 ' * BASIC GET./PUT. DEMONSTRATION *
30 ' * THE EQUIVALENT OF LINES 60-180 MUST BE INCLUDED *
40 ' * IN ALL PROGRAMS THAT USE THE FRAMER SUBROUTINES *
50 ' *****
60 A=648291-700 ' RESERVE BUFFER SPACE
70 MSB=INT(A/256):LSB=A-(MSB*256) ' CALCULATE MEMSIZE ADDRESS
80 POKE &HFE94,LSB:POKE &HFE95,MSB ' CALCULATE MEMSIZE ADDRESS
90 CLEAR,A ' SET PROTECTED MEMORY SIZE
100 SYSTEM*LOAD FRAMER/CMD:0" ' LOAD FRAMER ROUTINES
110 DEFINT A-Z:DIM FRAME(2) ' DIMENSION 3 FRAMES
120 FOR I=0 TO 2 ' DEFINE FRAME SIZES
130 FRAME(I)=210 ' EACH FRAME = 210 BYTES
140 NEXT ' LOOP FOR NEXT FRAME
150 INITIAL=&HFD3E ' INIT FRAME SUBROUTINE
160 GET.=&HFD80 ' GET. FRAME SUBROUTINE
170 PUT.=&HFE0E ' PUT. FRAME SUBROUTINE
180 CALL INITIAL(FRAME(0)) ' SETUP BUFFERS
190 ' ***** STRING INITIALIZATION *****
200 B$=STRING$(3,32) ' DEFINE SAILBOAT
210 SB$(1)=B$+CHR$(160)
220 SB$(2)=B$+CHR$(170)+CHR$(189)+CHR$(144)
230 SB$(3)=B$+CHR$(170)+STRING$(2,191)+CHR$(180)
240 SB$(4)=B$+CHR$(170)+STRING$(3,191)+CHR$(189)+CHR$(144)
250 SB$(5)=B$+CHR$(170)+STRING$(4,191)+CHR$(189)
260 SB$(6)=B$+CHR$(170)+STRING$(5,143)+CHR$(141)+CHR$(132)
270 SB$(7)=B$+CHR$(191)+CHR$(179)+CHR$(191)+CHR$(179)+CHR$(191)
280 SB$(8)=CHR$(139)+CHR$(175)+STRING$(11,191)+CHR$(175)
290 CLS:PRINT CHR$(15); ' TURN CURSOR OFF
300 '***** GET. SAILBOAT ROUTINE *****
310 FOR WATER=17 TO 22 ' DISPLAY WATER
320 PRINT#WATER*80,STRING$(80,191);
330 NEXT WATER
340 PRINT@(16,0),STRING$(80,189); ' DISPLAY WAVES
350 FOR SAILBOAT=8 TO 15 ' DISPLAY SAILBOAT
360 PRINT@(SAILBOAT,64),SB$(SAILBOAT-7);
370 NEXT SAILBOAT
380 AROW=8:ACOL=64:AROW1=15:ACOL1=79 ' GET. COORDINATES
390 CALL GET.(AROW,ACOL,AROW1,ACOL1,FRAME(0)) ' GET SAILBOAT
400 ' ***** GET. POWERBOAT ROUTINE *****
410 GOSUB 660 ' GET. POWERBOAT VIA POKE
420 BROW=14:BCOL=0 ' POWERBOAT PUT. COORDINATES
430 ' ***** GET. BANNER ROUTINE *****
440 PRINT@(1,30),CHR$(191)+STRING$(18,131)+CHR$(191)
450 PRINT@(2,30),CHR$(191)+" F R A M E R "+CHR$(191)
460 PRINT@(3,30),CHR$(191)+"GRAPHICS + UTILITY"+CHR$(191)
470 PRINT@(4,30),CHR$(191)+STRING$(18,176)+CHR$(191)
480 CROW=0:CCOL=29:CROW1=4:CCOL1=50 ' GET. COORDINATES
490 CALL GET.(CROW,CCOL,CROW1,CCOL1,FRAME(2)) ' GET. BANNER
500 ' ***** ANIMATION AREA *****
510 FOR TIMEDELAY=1 TO 2000:NEXT
520 FOR BANNER=1 TO 11 ' MOVE BANNER DOWN
530 CALL PUT.(CROW,CCOL,FRAME(2)):CROW=CROW+1
540 NEXT BANNER
550 CALL PUT.(AROW,ACOL,FRAME(0)) ' PUT. SAILBOAT
560 CALL PUT.(BROW,BCOL,FRAME(1)) ' PUT. POWERBOAT
570 CALL PUT.(CROW,CCOL,FRAME(2)) ' PUT. BANNER
580 CCOL=CCOL-1 ' MOVE BANNER LEFT
590 IF CCOL<-22 THEN CCOL=79 ' WRAPAROUND BANNER
600 ACOL=ACOL-1 ' MOVE SAILBOAT LEFT
610 BCOL=BCOL+1 ' MOVE POWERBOAT RIGHT
620 X$=INKEY$:IF X$="" THEN 550
630 IF X$=CHR$(129) THEN RUN ' RESTART DEMO
640 GOTO 550
650 ' ***** OPTIONAL BUFFER LOAD ROUTINE *****
660 LSB=PEEK(VARPTR(FRAME(1))) ' LSB ADDRESS OF POWERBOAT FRAME
670 MSB=PEEK((VARPTR(FRAME(1))+1)) ' MSB ADDRESS OF POWERBOAT FRAME
680 BUFADR=((MSB*256)+LSB)-655361 ' CALCULATE FRAME START ADDRESS
690 FOR COUNTER=0 TO 28 ' FRAME LOADER POKE ROUTINE
700 READ POWERBOAT ' POWERBOAT DATA
710 POKE BUFADR+COUNTER,POWERBOAT ' READ INTO BUFFER
720 NEXT COUNTER ' LOOP UNTIL COMPLETE
730 RETURN
740 DATA 32,32,32,168,131,131,131,131,147,164,32,32,144,13,32
750 DATA 171,191,191,191,191,191,191,191,191,191,191,135,254

```

End

| Address | Function                                  |
|---------|---|
| FE94    | Least-significant bit of protected memory |
| FE95    | Most-significant bit of protected memory  |
| FE96    | Current COL variable image                |
| FE97    | Current ROW variable image                |
| FE98    | Current ROW1 variable image               |
| FE99    | Current COL1 variable image               |

Note: FE96-FE99 are screen-position references, which may be PEEKed following a parameter error message to help determine which variable caused the error.

Table. Framer reference addresses.

how many frames are needed. For my demonstration, I've reserved three buffers with the DIM FRAME(2) statement.

The For. . .Next loop in lines 120-140 defines the size of the buffers, which in my example are all the same; they can be larger than the frame but not smaller. You can vary the sizes by defining each element of the FRAME(n) integer array separately, using the following format:

```

FRAME(0)=200:FRAME(1)=400:
FRAME(2)=600

```

The values you choose for this array are the ones to total and plug into line 60.

Lines 150-170 assign variable names to the subroutines and define their execution addresses. The period in the GET. and PUT. variables turns the two keywords into variables. You might want to change them if you're using random files in the same application with Framer.

Line 180 completes the initialization process. The call to the Initial subroutine makes error checks and maps out the buffers in memory starting immediately below Framer's subroutines (the buffer area always begins at address 64829 and builds downward toward Basic's stack and disk-buffer area). With an average-size Basic program, you can store up to 11 video screens in this area.

## Nautical Scene

The demonstration graphics program is contained in the remaining 57 lines of Listing 2.

Lines 210-290 draw an ocean scene complete with small whitecaps and a sailboat printed on the right. I define the sailboat using the N\$ = CHR\$(n) + CHR\$(n) method and display it with PRINT N\$.

In line 380 you set the coordinates for the upper-left and lower-right corners of the frame surrounding the screen information to be moved. The upper-left variables are AROW and ACOL and the lower-right variables are AROW1 and ACOL1. The range for rows is zero to 23; for columns, it's zero to 79.

Two methods place the sailboat image in the FRAME(0) buffer. In the first, line 390 calls the GET. subroutine. The variable FRAME(0) tells the routine to save the area bounded by the invisible frame as FRAME(0). Framer then places a CHR\$(13) in the buffer as a terminating character for each video row. When all the rows have been placed in the buffer, a CHR\$(254) is added to mark the end of the frame. Note that the row and frame terminator characters are overhead and must be taken into account when calculating the buffer size. The formula is:

$$SIZE = ((ROW1 - ROW) + 1) * ((COL1 - COL) + 1) + (n \text{ ROW TERMINATORS}) + (\text{END MARKER})$$

If your application won't leave you short of memory, just multiply the number of rows by the number of columns in each row, and add 50 (for the row terminator

# ENHANCE YOUR TANDY

The **Full House** will expand your Tandy 1000 to its full I/O and memory configuration for only **\$315**.

## Features:

2 parallel ports (centronics)  
2 serial ports (RS232)  
Real Time clock/calendar  
Memory, up to 512K  
DMA Controller

The **Full House** is actually a combination of two boards that can be joined into **one**. You have the option of buying either the I/O or memory section first and **later combining the two without using an additional slot**. Each can also be used separately.

|            |                    |       |
|------------|--------------------|-------|
| Full House | I/O                | \$170 |
| Full House | Memory (256K)      | \$130 |
| Full House | Memory (512K)      | \$165 |
| Full House | Combination (512K) | \$315 |

**Dealer inquiries welcome.**

Mastercharge/Visa accepted.

To order, in California call:  
800 626-9541 ext. 1131

Elsewhere:  
800 452-4445 ext. 1131

Call now to get the value and flexibility that **nobody else** offers.

Circle 297 on Reader Service card.

**SJS Engineering, Inc.**  
Sunnyvale, CA

and buffer end markers) to get a rough but quick estimate of the buffer size.

Don't worry about a frame jumping out of its assigned buffer and crashing into other frames because you miscalculated the size. The Initial subroutine marks the end of each buffer with a CHR\$(253); when the GET. subroutine encounters the marker, it stops retrieving screen information and forces program control to the Basic Ready prompt. An overrun message then warns you that the frame is too big for the buffer.

The routine starting on line 410 demonstrates the POKE method of loading a frame buffer. (The Table shows the important memory addresses.) In this method, the object is loaded without using the screen and the GET. subroutine to place the frame in the buffer. The subroutine starting at line 660 calculates the buffer start address; you can access a pointer to this address from your Basic program using the n = VARPTR (FRAME(n)) argument. The address will be placed in Basic's variable storage area during the call to the Initial subroutine in line 180, where Framer reads the requested buffer size of FRAME(n) and replaces that value with the buffer's starting address.

The Basic subroutine next reads the Data statements in lines 740-750 and places the values in the FRAME(1) buffer. Note the addition of a row terminator in line 740 and the frame end marker in line 750.

The third animated object in the demonstration program is a message banner, which is printed by lines 440-470 and loaded into FRAME(2) in the same manner as the sailboat was loaded into FRAME(0). Note that each object has its own integer variables to allow independent animated movements.

The banner is first displayed at the top of the screen. Following a short time delay in line 510, the For. . .Next loop starting in line 520 moves the banner rapidly down-screen. Each pass through the loop provides a call to the PUT. subroutine and increments the value of the CROW variable. Observe that when using PUT., only the CROW and CCOL (the upper-left row/column coordinates) are passed to Framer. Compare this with the four variables that are combined with the GET. subroutine in line 490 to place the frame in the buffer. Since the frame was initially formatted as a rectangle using the GET. subroutine, with PUT. it will automatically go back to the screen in the same form, starting at the CROW/CCOL coordinates.

Each pass through the main animation loop starting in line 550 calls the PUT. subroutine and increments the variables that control objects. Notice that the banner travels completely off the left side of the screen before reappearing on the right side. The If. . .Then argument in line 590 creates this effect by allowing the CCOL variable to assume a negative value before

reassigning it a column value of 79, which will make the banner reappear on the right side of the display.

In my application, the variables controlling the boats are allowed to increment infinitely, providing the illusion of random movement. Framer copies an image of Basic's variable values and stores them in memory locations within its own subroutine. While Basic maintains an incremental count ranging from the first assigned value to a maximum of 65535, Framer resets variable pointers to zero after they reach 255, the maximum value. This allows the boats to pass smoothly and completely off screen.

Of course, if you let the program run a long time, you'll have to find a way to reset Basic's variables before they trigger an overflow condition. This only works with the PUT. subroutine, however. Attempts to enter values outside of prescribed video row/column ranges generate a parameter error message when you're using the GET. subroutine.

## **Brush, Light Switch, And Layer Cake**

I'll describe three ways to use Framer for animated sequences.

The first, which I call the brush method, causes no irritating flicker as the object moves across the display. However, two objects cannot pass on the same plane, and the background over which the object passes is destroyed.

You can display the object with a leading or trailing blank space that "brushes" away the lighted trail it would normally leave behind. The statements:

```
PRINT CHR$(191) + CHR$(191) + CHR$(32)
```

provide a trailing brush, while the following provide a head brush:

```
PRINT CHR$(32) + CHR$(191) + CHR$(191) + CHR$(32)
```

You'll need the latter if you've set up your program for bidirectional movement. You must also include a top and bottom brush if you want to have the object move vertically across the screen.

You can instruct Framer to provide the brushes. Print the object you wish to animate on a blank area of the display. Then use the GET. subroutine with a frame that contains the object plus the correct number of blank spaces for the brushes you need. Now you can easily move the object by calling the PUT. subroutine.

Method 2, the light-switch method, lets objects traveling in opposite directions pass through each other on the same plane without destroying themselves. The background over which the objects pass will be altered, however.

This approach is like turning a light bulb on and off rapidly and requires two frames. First draw or print the object on screen and use GET. to put it in FRAME(1); do the same with an equal

sized FRAME(2), this time filled with blank spaces. The following steps move the object from left to right:

1. PUT. FRAME(1).
2. PUT. FRAME(2).
3. Increment the COL variables of both frames.
4. Repeat steps 1-3.

This method works well with small objects, but large ones produce a noticeable flicker due to the slow processing speed. The CPU must cycle frames at a rate of about 60 times per second before the flicker becomes undetectable to the naked eye.

Method 3, the layer-cake method, works best with small- and medium-sized rectangular objects. It has the advantage of preserving the background and the drawback of causing some flickering.

Keep the size of the frame surrounding the foreground to a minimum. The layer-cake method requires two frames for each object being animated; they are produced in the following steps:

1. Draw an object on the display—let's say it's a car—and think of it as layer 1 (the foreground).
2. Use GET. to place the car in FRAME(1).
3. Clear the screen.
4. Print a scene for the car to travel through. Visualize the scene as layer 2 (the background).
5. Set up FRAME(2) using the same size and screen coordinates as FRAME(1).

Then move the car from left to right with the following statements:

6. GET. FRAME(2) to produce the background (that part of the scene beneath where the car will next appear).
7. PUT. FRAME(1) to produce the foreground (the car) at the same coordinates as the background.
8. PUT. FRAME(2) to replace the background at the same coordinates.
9. Increment the COL variable of FRAME(1).
10. Increment the COL,COL1 variables of FRAME(2).
11. Loop and repeat steps 6-10.

### Animation Applications

In addition to providing animated graphics, Frammer can control the video display in ways that are impossible to achieve with Basic alone.

It is easy, for example, to move large blocks of text around the screen. Use GET. to form the invisible frame around the block and PUT. to place the block elsewhere on screen.

Pull-down and pop-up menus are equally easy to program and can come in handy. You can define a series of small rectangular menus that have been coded to move down from the top of the display when specific keys are pressed.

Framer also has its limitations. It lacks GBasic's ability to supply a logical operator (AND, OR, and XOR) with the PUT. subroutine, for instance. Such operators instruct graphics routines to combine existing screen characters with new information PUT. is about to place on screen.

Finally, here are a few hints to help you get the most out of Frammer. The program is compatible with Drawstring, my program for drawing graphics sequences. You can use both routines at the same time by loading them with successive TRSDOS Load commands.

The memory area between FE9A and FFFF hex is available for your own Assembly-language routines if you're not using Drawstring. However, I don't recommend letting TRSDOS store its own drivers or filters there.

If you use a POKE instead of the GET. subroutine to load frame buffers, be careful not to overfill the space assigned to the frame buffer. The POKE method provides no check for overrun errors.

To speed up coding of applications that include Frammer, save lines 60-180 of Listing 2 as a program file in ASCII format. You can then use the Merge statement to combine the file with existing Basic programs. Remember to renumber the existing program to start with line 190 before merging the files. ■

*John D. Wolfskill welcomes correspondence. You can write to him at 201 Puritan Drive, Middletown, RI 02840. Be sure to enclose a self-addressed, stamped envelope for a reply.*

Circle 437 on Reader Service card.

## Portable Software Inc.

PO Box 394  
Nottingham, PA 19362  
24 hr. PHONE  
(215) 932-5395

Model 3/4

**Football \$29.50**

**Casino 22.50**

**NEW Model 4**

**Baseball 29.50**

**Golf 34.50**

2 Disks-3 Courses-Beginner  
Local Pro-World Champion

**T-Shirt 6.50**

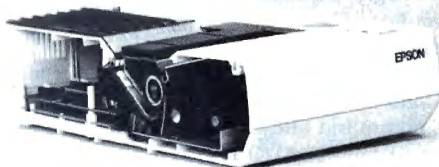
S,M,L,XL Blue/Grey  
Watch for coming  
Golf Tournament

PORTABLE  
SOFTWARE

Circle 452 on Reader Service card. **POP QUIZ**

## Attention all FX80, FX100, JX, & RX owners: You already own half of a great printer

Now  
Only  
\$79.95



Now for \$79.95 you can own the rest. You see, today's new dot matrix printers offer a lot more.

Like an NLQ mode that makes their letters print almost as sharp as a daisy wheel. And font switching at the touch of a button -

in over 160 styles. But now, a Dots-Perfect upgrade kit can make your printer work like the new models in minutes. At a fraction of their cost.

Call now and use your Visa or Master Card. Don't replace your printer, upgrade it!

**1-800-368-7737**  
In California: 1-800-831-9772

**g** Sample of letter with Dots-Perfect

**Dots-Perfect**

Sample of letter without Dots-Perfect

**Dresselhaus**

837 E. Alosta Ave., Glendora, CA 91740 Tel: (818) 914-5831

An upgrade kit for EPSON FX, JX and RX printers



EPSON is a trademark of EPSON America, Inc.

# Making the Grade

Teachers, keep your grade books in order with this easy-to-use student-management system.

Most school teachers dread report-card time almost as much as students do. Calculating scores and determining grades is a tedious task requiring hours of manual work with numbers and letter grades. To drive the worm out of the teacher's apple, I've written Mark4, a Basic program for the Model 4 that automates many of the procedures involved in report-card preparation.

Mark4 provides a data-base structure into which teachers can enter student names, raw scores, and letter grades. It permits editing and deletions and will calculate scores for individual students or entire classes. The program also allows you to display directories of student data files and print out class forms with blank boxes for entering grades.

## Elementary Schooling

Mark4 is menu-driven, making it easy for even novices to use. To put it to work, type in the Basic code in the Program Listing and save it to a minimum-configuration system disk (one with all unnecessary files purged). You'll also have to install the TRSDOS Forms filter program (Forms/FLT) and set the following parameters: characters 110, page 66, line 66, and margin 1. The filter program enables Mark4's top-of-form (TOF) commands to work with your printer. Then configure the disk with the TRSDOS SYSGEN command and delete Forms/FLT. Consult the TRSDOS owner's manual for further instructions on setting up your printer.

Once you've entered Mark4 and have run it, you're ready to set up a data base. Select the first option from the program's main menu (see the Photo) by pressing the 1 key. You will be prompted to type in class, block/period, and term designations. Press the enter key after each entry.



## System Requirements

**Model 4**  
**(Model 1000 with changes)**  
**64K RAM**  
**Disk Basic**  
**Printer optional**

Program Listing. Mark4. (See p. 112 for information on using the checksums in this listing.)

```

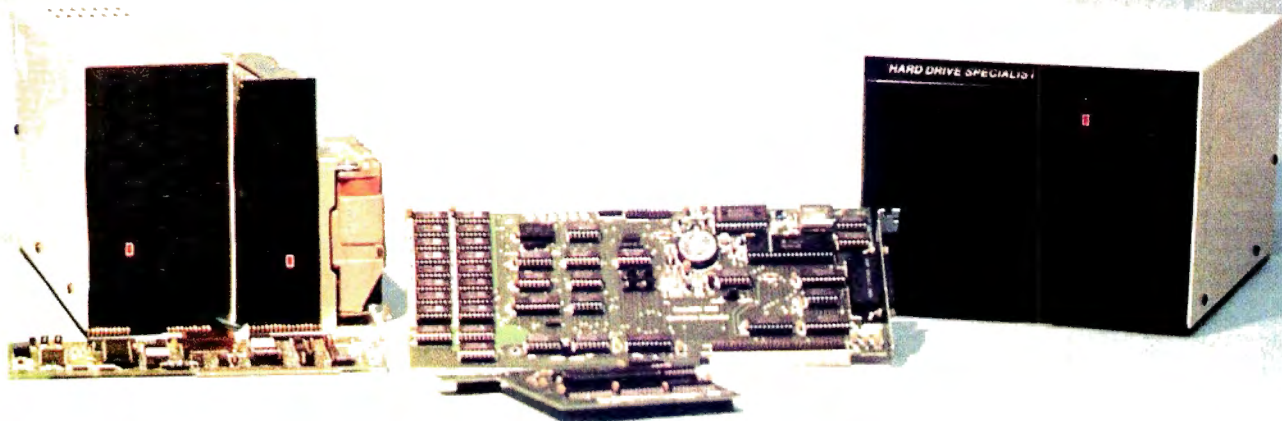
10 REM * BY OREST KOWALYSYHN * * * * *
20 REM *
30 REM ** INITIALIZATION **
40 REM
50 DIM NAMES$(50),MARKS$(50),RAW(50),GR(10),REPS(50),ED(50),TNAM
E$(50),TMARK$(50)
60 FL=0:E=0;TERM=5:MAX.TERM=3:IN$=CHR$(16)+"Press <e> to Escape
to MAIN MENU or select"+CHR$(17):PRINT CHR$(15)
70 REM
80 REM ** MAIN MENU **
90 REM
100 CLS:PRINT DATE$;TAB(26)" M A R K S 4 M E N U";:PRINT TAB
(70)"5.00:00":PRINT STRING$(80,95);:PRINT@(5,25),"S Y S T E
M O P T I O N S":PRINT:PRINT TAB(30)"1. ADD MARKS / NAME
S"
110 PRINT TAB(30)"2. REQUEST OUTPUT":PRINT TAB(30)"3. EDIT MAR
K FILES":PRINT TAB(30)"4. DELETE DATA":PRINT TAB(30)"5. PR
INT DISK CATALOG":PRINT TAB(30)"6. PRINT MARK FORMS"
120 PRINT@(19,36),"X - Exit":PRINT STRING$(80,95):PRINT TAB(32)"
Enter selection ?_";
130 GOSUB 1330
140 NUM$=KEY$:IF VAL(KEY$)>0 AND VAL(KEY$)<5 THEN PRINT CHR$(15)
:GOSUB 1360:GOSUB 1430
150 IF VAL(KEY$)=7 THEN PRINT CHR$(15):GOSUB 1360:GOSUB 1430
160 ON VAL(NUM$) GOTO 190,360,630,850,1250,1270
170 GOTO 130
180 REM ** MARKS ENTRY ROUTINE **
190 PRINT@(4,0),:PRINT@(5,0),"MARKS ENTRY -":PRINT TAB(5)"1. E
NTER MARKS - "CHR$(16)"NO. of marks : ";LEN(MARKS$(1))/S
;CHR$(17):PRINT TAB(5)"2. ENTER NAMES - "CHR$(16)"STUDE
NTS #:";LOF(1)-1;CHR$(17):PRINT STRING$(80,95):PRINT@(22,0),
IN$
200 GOSUB 1330:IF KEY$=CHR$(31) THEN KEY$="1":STFILE=0:GOTO 140
210 ON VAL(KEY$) GOTO 230,290
220 GOTO 200
230 PRINT@(4,0),:PRINT@(5,0),"MARKS DATA - ";MARKS$(1):PRINT S
TRING$(80,95);:PRINT@(6,0),"
240 FOR I=BEGIN TO LOF(1):PRINT NAMES$(I);:LINE INPUT M$:IF LEN(
M$)=0 THEN M$="0"
250 MARKS$(I)=MARKS$(I)+M$+STRING$(S-LEN(M$),32)
260 NEXT I
270 IF S=6 THEN MARKS$(1)=MARKS$(1)+"99"+STRING$(4,32)
280 GOTO 340
290 IF LOF(1)=0 THEN NAMES$(1)="TOTAL"+SPACE$(15):LSET NA$=NAMES
$(1):LSET MA$="":PUT 1,1
300 PRINT@(9,0),"N A M E S D A T A (- 1 T O E N D)":R=10:C
=0:I=LOF(1)+1
310 PRINT@(R,C);:LINE INPUT N$:IF N$="-1" THEN 340 ELSE NAMES$(
I)=N$+STRING$(20-LEN(N$),32):I=I+1
320 C=C+20:IF C>60 THEN C=0:R=R+1
330 GOTO 310
340 GOSUB 1520:GOSUB 1500:GOTO 190
350 REM ** PRINTER ROUTINE **
360 GOTO 500
370 GOSUB 1330:IF KEY$=CHR$(31) THEN KEY$="2":STFILE=0:GOTO 140
380 ERASE GR:DIM GR(10)
390 IF KEY$="M" THEN 60 ELSE IF KEY$="H" THEN 400 ELSE IF KEY$="
U" AND S=3 THEN 1030 ELSE IF KEY$="R" THEN 500 ELSE 370
400 PRINT@(15,16),"P R I N T E R W O R K I N G . . . . .
":AVE=0:FOR I=1 TO LOF(1):TTL=0:FOR J=1 TO LEN(MARKS$(I))
STEP S:TTL=TTL+VAL(MID$(MARKS$(I),J,S)):NEXT J:RAW(I)=TTL:AV
E=AVE+TTL:NEXT I:AVE=(AVE-RAW(1))/(LOF(1)-1)/RAW(1)*100
410 LPRINT CHR$(27);CHR$(23):LPRINT CHR$(15);CHR$(27);CHR$(31)"M
ARKS REPORT - VERSION 4.00.00"CHR$(14)CHR$(27) CHR$(32):LPR
INT:IF S=6 THEN 470
420 WIDTH LPRINT 93:LPRINT CHR$(27)CHR$(31)"DATE :";DATE$;SPC(10
);"CLASS :";CL$;SPC(5);"BLOCK :";BL$;SPC(5)"TERM :";T$;CHR$(
27)CHR$(32):LPRINT STRING$(93,"-");
430 FOR I=2 TO LOF(1):LPRINT NAMES$(I);MARKS$(I);:TTL=RAW(I)/RAW(
1)*100:LPRINT USING "###.###" ;RAW(I);TTL;:GOSUB 1640:LPR
INT GR$
440 NEXT I:LPRINT STRING$(93,"=");CHR$(27);CHR$(31);NAMES$(1);MA
RK$(1);:LPRINT USING "###";RAW(1):LPRINT:LPRINT CHR$(15)"AV
ERAGE :";:LPRINT USING "###.###";AVE
450 LPRINT "MARKS DISTRIBUTION :";CHR$(14);:LPRINT TAB(26)"A
B C+ C- D E I"
460 LPRINT TAB(24);:FOR C=1 TO START:LPRINT USING "##
";GR(C)

```

Listing continued



# The Best Money Can Buy . . .



## Model 1000 Multifunction Boards

### TanPak™

The TanPak™ expansion board has been designed to allow expansion beyond the scope of the standard Model 1000. Seven of the most needed functions/features have been combined into one package using only one expansion slot. Your remaining spaces are left free for future expansion needs. Features include memory up to 512K, RS232 Serial Port, Clock-Calendar, DMA, Printer Spooler, Memory Disk, and an Expansion System.

**TanPak™ 0K . . . . . \$329.**

### TanPak™ Secondary

If you already have a Model 1000 memory board and do not wish to replace it, the TanPak™ Secondary is for you. It retains all the features of the TanPak™, except for the DMA.

**TanPak™ Secondary 0K . . . . . \$249.**

## TANDY 1000

**RS232C Serial— Clock/Calendar  
Piggy/Back Card by Hard Drive Specialist**

**NEW**

Now available for the TanPak, the Tandy Memory Expansion PLUS Card, the HDS Memory Expansion Plus Card, and other boards that configure their expansion port with side A (component side) routing conductors to the top side of the 62 conductor dual row header.

**RS232C Serial Port** features a standard female RS232C female just like the Tandy boards, or specify the male version. The port can be set up as COM 1 or COM 2.

**Clock/Calendar port** features a perpetual clock for automatic time/date input into your programs as well as power up routine. The clock has an interchangeable port selector that allows the use of another clock on line.

Please order your Board by part number

|  | Part Number |        |
|--|-------------|--------|
| <b>RS232C for Memory Expansion PLUS Cards</b>      | EPRS 232    | \$85.  |
| <b>RS232C for TanPak and Other Cards</b>           | TPRS232     | \$85.  |
| <b>Clock/Calendar for all Boards</b>               | CLCA        | \$85.  |
| <b>Clock/Calendar-RS232C for PLUS Cards</b>        | EPRS232CL   | \$170. |
| <b>Clock/Calendar-RS232C for TanPak and Others</b> | TPRS232CL   | \$170. |

(If you need a male RS232C connector, add the letter M to the end of the above Part #'s)

## Tandy 1000 Hard Drives

Shop and compare. Hard Drive Specialist has been building hard drive systems for years and have sold thousands of subsystems to satisfied Radio Shack/Tandy customers. Our drives all use buffered seek logic and plated media to result in almost one-fourth the average access found on our competitor's drives. Internal drive systems include an interface card and a half-height hard drive that replaces the top disk drive in both size and power consumption. External units include an interface card, case, power supply, and hard drive unit. All units require a memory board with DMA compatible with the Tandy 1000.

**10 Meg Internal . . . . . \$549. External . . . . . \$699.**  
**20 Meg Internal . . . . . \$749. External . . . . . \$899.**  
**42 Meg Internal . . . . . \$1349. External . . . . . \$1495.**  
**20 Meg Internal for use with 2 disk drives . . . . . \$769.**

## TANDY 3000 HARD DRIVES NEW

Now available for the TANDY 3000. Hard Drives that meet or beat the Tandy Products at a fraction of the cost. All drives include a controller card that also replaces the floppy card to save you a card slot.

**10 MEGABYTE Subsystem . . . . . \$649.**  
**20 MEGABYTE Subsystem . . . . . \$849.**  
**42 MEGABYTE Subsystem . . . . . \$1449.**  
 (add \$150 for external systems)

## Model 1, 3, 4 Hard Drives

|               | Primary | Secondary |
|---------------|---------|-----------|
| <b>5 Meg</b>  | \$795.  | \$595.    |
| <b>10 Meg</b> | \$1095. | \$895.    |
| <b>20 Meg</b> | \$1295. | \$1095.   |
| <b>30 Meg</b> | \$1895. | \$1695.   |

(Model 1 add \$50.)

**Model 3/4 RS232 Kit . . . . . \$69.**  
**Model 3/4 Disk Controller Board . . . . . \$99.**

## HARD DRIVE SPECIALIST

**Order Line**  
**1-800-231-6671**  
**1-713-480-6000**

**16208 Hickory Knoll**  
**Houston, Texas 77059**

### Ordering Information:

Use our WATS line to place your order via Visa, MasterCard, or Wire Transfer. Or mail your payment directly to us. Any non-certified funds will be held until proper clearance is made. COD orders are accepted as well as purchase orders from government agencies. Most items are shipped off the shelf with the exception of hard drive products that are custom built. UPS ground is our standard means of shipping unless otherwise specified. Shipping costs are available upon request.



**Rose**

**QUALITY DISK DRIVES**

These drives are complete with power supply, cover and external drive connector. For TRS-80 Model I, III, 4, IBM PC and others. All drives are Double Density and step at 6ms or less. SS means single head, DS is double head. Specify white or silver color cover for no additional charge or my beautiful new Stainless Steel cover for only \$9 additional. Add \$5 per drive shipping unless otherwise specified. All drives have a one year warranty on parts and labor. Bare drives, that is, just the drives themselves are also available for those of you who don't need or want one of my power supplies.

**COMPLETE 3.5" - 5.25" - 8" DISK DRIVES**

- 1ea. 40tk DS TEAC FD-35B in a dual case ..... 157
- 2ea. 40tk DS TEAC FD-35B in a dual case ..... 255
- 1ea. 80tk DS TEAC FD-35F in a dual case ..... 177
- 2ea. 80tk DS TEAC FD-35F in a dual case ..... 285

- 40tk SS Tandon TM100-1 ..... \$ 147
- 40tk DS Tandon TM100-2 ..... 157

- 1ea. 40tk SS TEAC FD-55A in dual case ..... \$ 127
- 2ea. 40tk SS TEAC FD-55A in dual case ..... 217
- 1ea. 40tk DS TEAC FD-55B in dual case ..... 137
- 2ea. 40tk DS TEAC FD-55B in dual case ..... 257
- 1ea. 80tk DS TEAC FD-55F in dual case ..... 157
- 2ea. 80tk DS TEAC FD-55F in dual case ..... 277

- Add \$10 S & H per case for these 8" drives.
- 2ea. SS TM848-1E's in dual case with fan ..... \$ 647
- 2ea. DS TM848-2E's in dual case with fan ..... 697

**BARE 5.25" & 8" DISK DRIVES**

Add \$4 shipping per drive.

- 40tk SS, Full Size, Tandon TM100-1 ..... \$ 99
- 40tk DS, Full Size, Tandon TM100-2 ..... 119
- 40tk SS, Half-High, TEAC FD55-A ..... 99
- 40tk DS, Half-High, TEAC FD55-B ..... 109
- 80tk DS, Half-High, TEAC FD55-F ..... 129
- 8" SS, Thinline, Tandon TM848-1E ..... 259
- 8" DS, Thinline, Tandon TM848-2E ..... 333

**TRS-80 MODEL III/4 DISK DRIVE KITS**

Add \$8 shipping per kit.

Internal drive kit complete with disk controller, power supply, mounting brackets, cables and all hardware plus step-by-step instructions. This kit contains everything you need (except the Disk Operating System, drive and a screwdriver) to convert your cassette Model III or 4 to fast reliable disk operation. Don't confuse this quality kit with the high-priced ripoffs. Thousands of satisfied customers cannot be wrong. You can join them for only ..... \$ 189  
 Same as above but with 1-40tk SS drive ..... 289  
 Same as above but with 2-40tk SS drives ..... 388

**TRS-80 MODEL I DOUBLE DENSITY CONTROLLERS**

Add \$3 shipping.

- Aerocomp "DDC" Really the best by test ..... \$ 99
- Aerocomp "DDC" with LDOS ..... 159
- Aerocomp "DDC" with NEWDOS 80-v2.0 ..... 179

**OTHER DRIVE GOODIES**

Add \$2 shipping.

- TRSDOS 1.3 Disk & Manual for Model III ..... \$ 24
- TRSDOS 2.3 Disk & Manual for Model I ..... 24
- TRSDOS 6.x Disk & Manual for Model 4 ..... 34
- LDOS for the Model I or III ..... 69
- NEWDOS 80 v2.0 for the Model I or III ..... 99
- 2-drive cable for Model I/III/4 ..... 24
- 2-drive external cable for IBM PC ..... 40
- 4-drive cable for Model I ..... 34
- Extender cable, 7' long ..... 9
- 5.25" power supply & encl., white or silver ..... 59
- Stainless Steel Covers ..... 12
- 8" power supply, fan & enclosure, beige ..... 149

**You've Got TOTAL ACCESS**

(specializing in TRS80 \*)

**TO YOUR COMPUTER HARDWARE & SOFTWARE NEEDS. CALL ROSE TODAY!**

**ROSE GETS RIGHT! NOW---ROSE'S MOD 4 CP/M \$ 69**

Complete with Manual

Rose has latched onto this slick version of CP/M 2.2 that allows you to run most of your favorite CP/M programs with ease. It even lets you read and write other manufacturers' disk formats. What could be nicer? They are in stock ready for you to use and enjoy.

**TRS-80 SPECIAL EQUIPMENT**

- 12" Green Comp. Monitor. Add \$10 for TTL ..... 89
- 12" Amber Comp. Monitor. Add \$10 for TTL ..... 84
- 16K 200 nsec RAM Guaranteed 1 year(8 chips) ..... 9
- 64K 200 nsec RAM Guaranteed 1 year(8 chips) ..... 19
- 64K RAM plus Genuine PAL for Model 4 ..... 29
- 256K 150 nsec RAM 1 yr guarantee (8 chips) ..... 39

**MEDIA & SUPPLIES**

- 5" Diskettes SSDD, Lifetime Guarantee. 10pk ..... \$ 16
- 5" Diskettes DSDD, Lifetime Guarantee. 10pk ..... 19
- 5" Flipsort, holds 75 Diskettes ..... 16
- 8" Diskettes SSDD, Lifetime Guarantee. 10pk ..... 24
- 8" Diskettes DSDD, Lifetime Guarantee. 10pk ..... 29
- 8" Flipsort, holds 50 Diskettes ..... 22
- 5.25" or 8" Head Cleaning Kit ..... 9
- Letter Size 20 lb. Tractor Paper, 2900 sheets ..... 25

**SPECIAL SOFTWARE DEALS** Add \$4 shipping.

- WordStar<sup>™</sup> 3.3 (Specify MM or R/S format) ..... \$ 195
- MailMerg<sup>™</sup>, SpellStar<sup>™</sup>, Starindex<sup>™</sup>, all 3 for just ..... 99
- WordStar Professional (Above 4 Programs) ..... 275
- DataStar<sup>™</sup> Data Entry & Retrieval ..... 125
- ReportStar<sup>™</sup> Report Generator ..... 105
- InfoStar<sup>™</sup> Advanced DBMS (Above 2 Programs) ..... 195
- dBASE II<sup>™</sup> Complete With Disk Tutorial ..... 345
- Super Utility Plus 3.2 by Kim Watt ..... 59
- CP/M 2.2 for Model 4 by Monte Zuma ..... 169
- Turbo PASCAL by Bor Land. Requires CP/M ..... 44
- Turbo Toolbox by Bor Land ..... 45
- Turbo TUTOR by Bor Land ..... 35
- Pickles & Trout CP/M 2.2m for the Model 2-12-16. Floppy Version ..... 179
- Same thing but the Radio Shack Hard Disk ..... 219

**CP/M & 80 COLUMN for your MODEL III**

No need to buy a new computer when you can use the Holmes VID-80 modification and get CP/M 2.2, 64K RAM and 80 column video. This kit is easy to install and requires no soldering. Even a dolt like you can end up with a complete 64K CP/M computer with an 80 column screen that is still able to run all your existing Model III software. For the first time you will be able to use CP/M programs that normal people do, such as dBASE II and WordStar. The regular price of this kit is \$524. Now Rose will get you going for only ..... Add \$5 shipping. **\$ 299**  
 I'll ship you the Holmes deal above PLUS WordStar 3.3 installed, complete with original manuals ready to run for only ..... **\$ 399**

**ORDER NOW! TOLL-FREE**

**800-527-3582**  
**Orders Only Please**

Call in your order or write to us at the address below. Texas residents call us at 214-337-4346 and deduct \$2.00 from your order but you should remind me 'cause sometimes I forget. If you need technical information or service please call the Texas number as the Toll Free lines are just for orders only. Prices are subject to change without notice and are mail order only. I accept AMERICAN EXPRESS, MASTERCARD and VISA and I will not charge your card until I ship your goodies. You can send a check or a money order. I also accept COD orders but they require cash or a cashier's check upon delivery. If shipping charges are not shown please call for the correct amount. Add \$5.00 handling charge if your order is less than \$50.00. Shipping charges quoted in this ad are for the lower 48 states only. Orders to Canadian address add \$20.00 to pay for doing all those papers for customs. Texans add State Sales tax. No tax collected on shipments outside of Texas. Be sure you know what you are buying. SOFTWARE IS SOLD ON A REPLACEMENT BASIS ONLY - NO REFUNDS. If it is defective call us for instructions. Please order from me now---I need the money and I will not jack you around. I reserve the right to charge up to a ten percent restocking charge if you jack me around. All merchandise carries the original manufacturers' warranty and all repairs or adjustments will be made by the manufacturer or his designated representative.

**NEXT DAY SHIPMENT** of Goods in Stock.

**TOTAL ACCESS**

**P.O. Box 790276**  
**Dallas, Texas 75379**  
**214-337-4346**

Listing continued

```

);NEXT C:LPRINT CHR$(27);CHR$(32);SYSTEM "TOP":GOTO 370      ** 7386
470 RESTORE:WIDTH LPRINT 100:LPRINT "DATE ";DATES;SPC(6);:FOR U
=1 TO TERM:READ A$(TERM):LPRINT A$(TERM);SPC(4);:NEXT U:LPRINT
"GRD";SPC(4);"FIN-MRK":LPRINT STRING$(90,"-")                ** 10999
480 FOR I=2 TO LOF(1):LPRINT NAMES$(I);:FOR U=1 TO LEN(MARKS$(I)
) STEP S:TTL=VAL(MID$(MARKS$(I),U,S)):LPRINT USING "|###.###%
";TTL;:NEXT U:TTL=RAW(1)/TERM:GOSUB 1640:LPRINT TAB(77)GR
$;SPC(4) USING "###.###%";TTL:NEXT I                          ** 13598
490 LPRINT STRING$(90,"-");LPRINT "CLASS ";CL$;SPC(10);"BLOCK :
";BL$:LPRINT:GOTO 450                                         ** 5264
500 AVE=0                                                       ** 510
510 FOR I=1 TO LOF(1):TTL=0:FOR J=1 TO LEN(MARKS$(I)) STEP S:TTL
=TTL+VAL(MID$(MARKS$(I),J,S)):NEXT J:RAW(I)=TTL:AVE=AVE+TTL:
NEXT I:AVE=(AVE-RAW(1))/(LOF(1)-1)/RAW(1)*100:IF S=6 THEN 58
0                                                                ** 11543
520 CLS:PRINT "DATE ";DATES;SPC(10);"CLASS ";CL$;SPC(5);"BLOCK
";BL$:SPC(5)"TERM ";T$:PRINT STRING$(80,"-");                ** 6724
530 FOR I=2 TO LOF(1):PRINT NAMES$(I)MARKS$(I);:GOSUB 1720:TTL=RO
AW(1)/RAW(1)*100:PRINT CHR$(16);USING "###.###%";RAW(1);TT
L;:GOSUB 1640:PRINT GR$;CHR$(17);                             ** 9477
540 IF LEN(MARKS$(I))<>48 THEN PRINT                             ** 2230
550 NEXT I:PRINT STRING$(80,"-");NAMES$(1);MARKS$(1);:PRINT USIN
G "###.###%";RAW(1)                                           ** 4730
560 PRINT:PRINT USING "AVERAGE :###.###%";AVE:PRINT "MARKS DISTRIB
UTION ";:PRINT TAB(26)"A      B      C      C      D
      E      I"                                               ** 7571
570 PRINT TAB(25);:FOR C=1 TO START:PRINT USING "###
";GR(C);
:NEXT C:PRINT:PRINT:PRINT:GOTO 610                             ** 6674
580 RESTORE:CLS:PRINT "DATE ";DATES;SPC(6);:FOR U=1 TO TERM:REA
D A$(TERM):PRINT A$(TERM);SPC(4);:NEXT U:PRINT "GRD":PRINT S
TRING$(80,"-");                                               ** 8866
590 FOR I=2 TO LOF(1):PRINT NAMES$(I);:FOR U=1 TO LEN(MARKS$(I))
STEP S:TTL=VAL(MID$(MARKS$(I),U,S)):PRINT USING "|###.###%
";TTL;:NEXT U:TTL=RAW(1)/TERM:GOSUB 1640:PRINT TAB(77)CHR$(
16)GR$CHR$(17):NEXT I:PRINT STRING$(80,"-");                 ** 14272
600 PRINT "CLASS ";CL$;SPC(10);"BLOCK ";BL$:PRINT:PRINT:PRINT
610 PRINT@(22,0),<M>enu,<H>ardcopy,<U>pdate final,<R>epeat,
<SHIFT-CLEAR> new class":GOTO 370                             ** 4030
620 REM *EDITING ROUTINE *                                     ** 7219
630 PRINT@(4,0),:PRINT@(5,0),"EDITING OPTIONS :-":PRINT TAB(5)"1
. NAMES / MARKS":PRINT TAB(5)"2. COLUMN EDITOR":PRINT STRIN
G$(80,95)                                                       ** 1658
640 E=0:GOSUB 1330:IF KEY$=CHR$(31) THEN KEY$="3":STFILE=0:GOTO
140                                                             ** 8285
650 ON VAL(KEY$) GOTO 670,760                                   ** 4028
660 GOTO 640                                                    ** 1688
670 PRINT@(9,0),"N A M E S / M A R K S":R=10:C=0:FOR I=1 TO LO
F(1):PRINT@(R,C),NAMES$(I);:C=C+20                             ** 687
680 IF C>60 THEN R=R+1:C=0                                     ** 5647
690 NEXT I:R=10:C=0:L=I-1:I=1:GOSUB 1540                       ** 1514
700 IF KEY$="N" THEN 750 ELSE 710                               ** 2426
710 FOR U=1 TO E:GOSUB 1500:PRINT@(9,0),"M A R K S E D I T O R"
:PRINT NAMES$(ED(U));"- ";MARKS$(ED(U)):PRINT STRING$(80,95
);NAMES$(ED(U));:MARKS$(ED(U))="":C=23:MID$(NAMES$(ED(U)),19
,2)=REP$(ED(U))                                               ** 1870
720 PRINT@(12,C),:LINE INPUT M$:IF M$="-1" THEN 740 ELSE IF LEN
(M$)=0 THEN M$="0"                                             ** 11696
730 MARKS$(ED(U))=MARKS$(ED(U))+M$+STRING$(S-LEN(M$),32):C=C+S:G
OTO 720                                                         ** 4781
740 NEXT U:I=LOF(1)+1:GOSUB 1520:GOSUB 1500:GOTO 640          ** 4263
750 FOR U=1 TO E:GOSUB 1500:PRINT@(9,0),"N A M E S E D I T O R"
:PRINT NAMES$(ED(U));"--- > C H A N G E T O "::LINE INPUT
N$:NAMES$(ED(U))=N$+STRING$(20-LEN(N$),32):NEXT U:I=LOF(1)+
1:GOSUB 1520:GOSUB 1500:GOTO 640                               ** 3165
760 PRINT@(9,0),"C O L U M N E D I T O R":C=20                ** 12673
770 FOR U=1 TO LEN(MARKS$(1))/S:PRINT@(10,C),CHR$(16);USING "###
";U;:C=C+S:NEXT U:PRINT CHR$(17):PRINT NAMES$(BEGIN);MARKS$(
BEGIN):PRINT NAMES$(BEGIN+1);MARKS$(BEGIN+1)                  ** 2577
780 PRINT@(12,75),:LINE INPUT KEY$:KEY=VAL(KEY$)              ** 10486
790 FOR I=BEGIN TO LOF(1):IF LEN(MARKS$(I))<KEY*S THEN 830    ** 3103
800 PRINT@(15,0),NAMES$(I);MARKS$(I)                           ** 3577
810 PRINT@(14,0),"Mark replacement in column #";KEY;MM$=MID$(MA
RK$(I),(KEY-1)*S+1,S):LINE INPUT M$:IF LEN(M$)=0 THEN M$=MM
$                                                                ** 2157
820 MID$(MARKS$(I),(KEY-1)*S+1,S)=M$+STRING$(S-LEN(M$),32):PRINT
@(14,29),SPACE$(10)                                           ** 8411
830 NEXT I:GOSUB 1500:GOSUB 1520:GOTO 640                      ** 4858
840 REM *DELETING ROUTINE*                                     ** 2514
850 PRINT@(4,0),:PRINT@(5,0),"DELETING OPTIONS :-":PRINT TAB(5)"
1. NAMES":PRINT TAB(5)"2. COLUMN DELETE MODE":PRINT STRIN
G$(80,95)                                                       ** 1702
860 E=0:GOSUB 1330:IF KEY$=CHR$(31) THEN KEY$="4":STFILE=0:GOTO
140                                                             ** 8232
870 ON VAL(KEY$) GOTO 890,960                                   ** 4033
880 GOTO 860                                                    ** 1698
890 PRINT@(9,0),"N A M E S - D E L E T E":R=10:C=0:FOR I=1 TO
LOF(1):PRINT@(R,C),NAMES$(I);:C=C+20                          ** 695
900 IF C>60 THEN R=R+1:C=0                                     ** 5734
910 NEXT I:R=10:C=0:L=I-1:I=1:GOSUB 1540                       ** 1509
920 OPEN "D",2,"SAMPLE/DAT",80:FIELD 2,20 AS SNA$,60 AS SMA$
** 2421
930 FOR I=1 TO LOF(1):FOR T=1 TO E:IF I=ED(T) THEN 950 ELSE NEXT
T                                                                ** 3460
940 LSET SNA$=NAMES$(I):LSET SMA$=MARKS$(I):PUT 2,LOF(2)+1
** 4017
950 NEXT I:CLOSE:STFILE=0:KILL CL$+T$+"/"+BL$:NAME "SAMPLE/DAT"
** 3595
AS CL$+LEFT$(T$,1)+"/"+BL$:GOTO 60
** 5887
960 PRINT@(9,0),"C O L U M N - D E L E T E":C=20              ** 2727
970 FOR U=1 TO LEN(MARKS$(1))/S:PRINT@(10,C),CHR$(16);USING "###
";U;:C=C+S:NEXT U:PRINT CHR$(17):PRINT NAMES$(1);MARKS$(1):PR

```

Listing continued

If you make a mistake, you can start over by pressing shift-clear. When you've answered all the prompts, the program opens a class file and brings up a submenu with two options.

The first option is for entering raw scores; the second is for entering student names. Select option 2 and begin entering names; make sure to press the enter key after each one. The program allows you to enter 40 student names per class, but for better performance, I advise entering no more than 35. A minimum-configuration system disk comfortably holds seven classes of 25 to 35 students, with each class broken into four terms. If you want to use a data disk in your second drive, put Mark4 on your system disk and write-protect it. The computer will then use drive 1 for all student files.

When you finish entering student names, type - 1 and press the enter key. The submenu will reappear on screen. Now pick option 1 to begin entering scores. You can enter 20 raw scores for each student in a class. To enter more than 20 scores, you must change the byte length in the program's Open statements and the mark length in the Field statements. When you've input all data, press the E key to return to the main menu.

## Class Scores

To print a listing of class scores on screen, select option 2 from the main menu. The program will display a grid of student names, a row of raw scores, and, in highlighted type, the total point score, percentage, and letter grade for each student. The class average and distribution of scores appear at the bottom.

The program displays a legend of options at the very bottom of the screen. Option M returns you to the main menu, R repeats the class listing, U copies the listed percentages to a final-term file (more on this later), H enables you to print a hardcopy, and shift-clear allows you to view another class file (see Fig. 1). If your printer can't handle the character strings (CHR\$) in lines 410-450, replace or delete them.

To edit names or marks that you've entered in a class file, return to the main menu (option M) and select option 3. This brings up another submenu with two options. The first allows you to edit specific names and marks in a class file. When the file appears on screen, you indicate the names you want to edit (no more than 12) by moving the cursor to them with the arrow keys. Press the enter key after each name. An asterisk will appear to the right, indicating that the program has tagged the name for a change.

When you're finished, press the N key if you want to edit names or the M key to edit marks. If you press N, the program will display the first of the tagged names and prompt you for the change. If you

Continued on p. 75

# Radio Shack has the

## Computer System Furniture

**299<sup>00</sup>** Reg. Separate Items 319.80



Spacious modular workstation is ideal for home or office. Features simulated oak finish. Easy to assemble.

**A System Desk.** Twin cable management slots for easy connections.

26-1356 ..... 119.95

**B Storage Hutch.** Mounts on system desk. Features adjustable "second shelf" on either side.

26-1359 ..... 59.95

**Half-Width Hutch.** (Not shown). 26-1374 ... 54.95

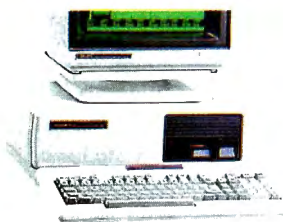
**C Corner Section.** Connects system desk and printer stand for a convenient "work corner."

26-1358 ..... 39.95

**D Printer Stand.** With output paper catcher and storage shelf.

26-1357 ..... 99.95

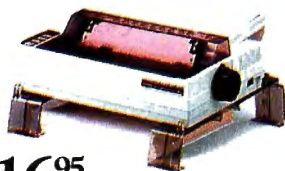
### Monitor Pedestal



**16<sup>95</sup>**

Adjustable platform rotates and tilts. Holds all Tandy monitors. Color and finish match monitors. Base: 11 x 10 1/4". (26-1369)

### Printer Supports



**16<sup>95</sup>**

Elevates printer so fan-fold paper can be placed underneath. Use with 80-column printers. Durable crystal polystyrene. Easy to assemble. (26-1367)

### Diskette Storage



Low As **12<sup>95</sup>**

3 1/2". Holds 30. 26-1381 ..... 12.95  
5 1/4". Holds 50. 26-1362 ..... 14.95  
8". Holds 50. 26-4953 ..... 24.95

### Disk Drive Head Cleaning Kits

Low As

**7<sup>95</sup>** Each



| Disk Size | Cat. No. | Each |
|-----------|----------|------|
| *3 1/2"   | 26-419   | 9.95 |
| 5 1/4"    | 26-408   | 7.95 |
| 8"        | 26-4957  | 8.95 |

\*Single sided only

### Fanfold Printer Paper

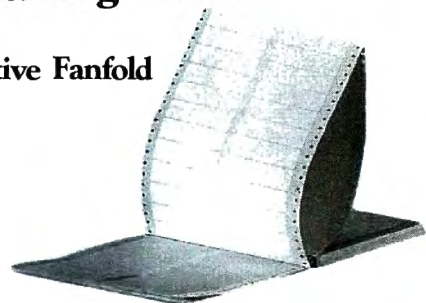


| Size         | Parts | Design    | Vertical | Qty. | Cat. No. | Price |
|--------------|-------|-----------|----------|------|----------|-------|
| 14 7/8 x 11" | 1     | Greenbar  | No       | 500  | 26-1330  | 11.95 |
| 14 7/8 x 11" | 1     | Greenbar  | No       | 1500 | 72-300   | 34.95 |
| 14 7/8 x 11" | 1     | Greenbar  | No       | 3500 | 26-1417  | 69.95 |
| 14 7/8 x 11" | 1     | White     | No       | 1500 | 72-303   | 34.95 |
| 9 1/2 x 11"  | 1     | Greenbar  | Yes      | 1500 | 72-304   | 24.95 |
| 9 1/2 x 11"  | 1     | Greenbar  | Yes      | 3500 | 26-1403  | 49.95 |
| 9 1/2 x 11"  | 1     | White     | Yes      | 500  | 26-1423  | 8.95  |
| 9 1/2 x 11"  | 1     | 20# White | Yes      | 500  | 26-1387  | 10.95 |
| 9 1/2 x 11"  | 1     | 20# White | Yes      | 1250 | 26-1427  | 24.95 |
| 9 1/2 x 11"  | 1     | 20# White | Yes      | 2500 | 72-311   | 44.95 |
| 9 1/2 x 11"  | 2     | White     | Yes      | 750  | 72-305   | 34.95 |

### Mailing Labels

#### Pressure-Sensitive Fanfold

Low As **6<sup>95</sup>**



1-Wide. 4 1/2" carrier. Pkg./1000. 26-1328 ..... 6.95  
1-Wide. 4 1/2" carrier. Pkg./5000. 72-402 ..... 24.95  
2-Wide. 9 1/2" carrier. Pkg./2000. 72-401 ..... 15.95  
3-Wide. 9 1/2" carrier. Pkg./3000. 72-400 ..... 16.95  
2-Wide. Dry gum. 9 1/2" carrier. Pkg./2400. 26-1456 ... 9.95

Items Shown With Optional Computer Components (Not Included).

# best of everything.

## Low-Cost, Compact Computer Workcenter

# 99<sup>95</sup>

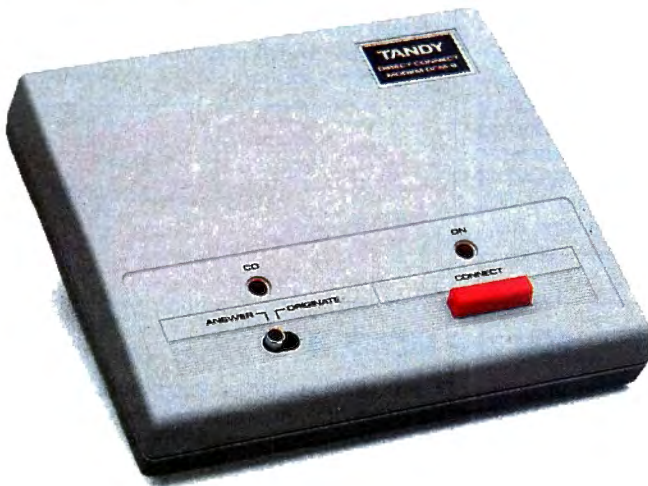
- Organize Your Computer System With This Compact, Efficient Workstation
- Beautifully Designed and Finished to "Fit In" with Other Furniture

Our beautifully styled, simulated oak finish workcenter features a full-width monitor shelf (41 1/2 x 14 3/4"), space for computer and printer, plus plenty of workspace. This easy-to-assemble workcenter comes with adjustable glides. (26-1350)



Perfect for Home, Office or School

## Data Communications Modem

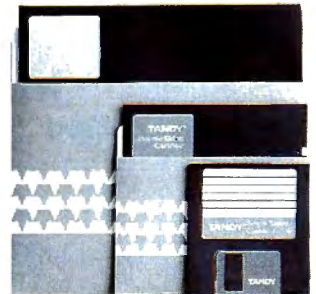


# 59<sup>95</sup>

DCM 3. 300-bps modem plugs directly into modular phone outlet. DB25 and 4-pin DIN connectors. Bell 103 compatible, full duplex. FCC registered. (26-1178)

## Certified Unformatted Diskettes

- Double Density
- Manufactured to the Highest Standards of Excellence
- Buy in 10-Pack Quantities and Save



### Single Sided

| Size   | Tracks | Quantity | Cat. No. | Price |
|--------|--------|----------|----------|-------|
| 3 1/2" | 80     | 3        | 26-415   | 15.95 |
|        | 80     | 10       | 26-416   | 44.95 |
| 5 1/4" | 40     | 1        | 26-305   | 2.19  |
|        | 40     | 3        | 26-405   | 5.95  |
|        | 40     | 10       | 26-406   | 15.95 |
| 8"     | 77     | 3        | 26-4904  | 10.95 |
|        | 77     | 10       | 26-4906  | 34.95 |

### Double Sided

| Size              | Tracks | Quantity | Cat. No. | Price |
|-------------------|--------|----------|----------|-------|
| 5 1/4"            | 40     | 3        | 26-411   | 6.95  |
|                   | 40     | 10       | 26-412   | 16.95 |
|                   | 80     | 3        | 26-409   | 8.95  |
|                   | 80     | 10       | 26-410   | 24.95 |
| 80 (high density) |        | 3        | 26-421   | 15.95 |
|                   |        | 10       | 26-422   | 44.95 |
| 8"                | 77     | 3        | 26-4961  | 12.95 |
|                   | 77     | 10       | 26-4960  | 39.95 |

Circle 75 on Reader Service card.

### POP QUIZ

**Radio Shack**  
The Technology Store™  
A DIVISION OF TANDY CORPORATION

Send me an RSC-17  
Computer Catalog.

Radio Shack  
Dept. 87-A-70  
300 One Tandy Center  
Fort Worth, Texas 76102

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ ZIP \_\_\_\_\_  
Phone \_\_\_\_\_

Complete the coupon below,  
or CALL TOLL FREE  
**1-800-258-5473**  
(In NH, dial 1-924-9471)



**YES**, please send me the  
80 Micro Special Collection(s)  
I've checked below:

**For the Model III:**

- The Best of the Model III,  
15 programs, just \$21.45\*

**For the Tandy 1000**

- Starter Pack 1000,  
13 programs, just \$26.50\*

**For the Model 4:**

- Utility Pack, 15 programs,  
just \$26.50\*
- Best of the Model 4,  
12 programs, just \$21.45\*

**Payment enclosed**  
**Amount \$** \_\_\_\_\_

**CHARGE MY:**

- Amex  Visa  MC

Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_

Name (print) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

\* Includes postage and handling. Foreign air-  
mail, please include US \$1.90 each. Please  
allow 4-6 weeks for delivery.

**9-86BI**

**MAIL TO:**

Load 80  
Elm St.  
Peterborough, NH 03458

# SELECT THE 80 MICRO POWER PACK FOR YOUR MACHINE!

Tandy 1000  Model III  Model 4

Software written especially for *YOU!*

Here's a lineup of *80 Micro's* most popular software, fully tested by our technical staff. And now ready-to-run on top quality disks. It's one of the most outstanding values in the industry! Complete documentation is included.

## FOR THE MODEL III

**Best of the Model III** —15 exceptional utilities and applications from the pages of 80 Micro. Includes debugging aid to let you single-step through Basic programs and display and change variables, spelling checker, the famous Hinrichs Basic Word Processor, printer spooler, machine-language terminal program, printed circuit board designer, disk drive timer, project manager...

...upgraded version of our Easydata data base manager, full-featured spreadsheet in Basic, full-screen graphics editor, patch editor and library, screen blank-out utility, macro builder for setting program parameters and customizing DOS commands, and utility to let you execute a group of DOS commands with a single command line.

## FOR THE TANDY 1000

**Starter Pack 1000** —13 exciting and useful programs to get you up and running. Includes spelling checker, futures trading simulator, project manager, graph generator, critical path scheduler, custom sort generator, simple-interest and Rule-of-78s calculator, routine to solve for roots of linear and nonlinear equations, data base manager, statistics program, memory-resident video blank-out utility, and six sub-routines to calculate math functions in double precision.

**ORDER NOW,  
WHILE SUPPLIES LAST!**

## FOR THE MODEL 4

**Utility Pak** —15 outstanding programmer's aids. Includes III-to-4 Basic converter, disk drive timer, string sorter to replace TRSDOS 1.3's CMD"O", pop-up help screen generator, disk-space mapper (**previously unpublished**), enhanced Debug, Model 100-like bar cursor directory program, routine to add Point, Set, and Reset to Basic...

...killed-file restorer, Basic cross-checker, function key programmer, Unix-like DOS shell with command library and multiple command feature, load-address locator, memory locator for scroll protection, the cursor character, and the function keys...

...and Basic editor extension with 11 features including string searcher, cross reference restorer, and line-number replace, copy, and move. (**Note:** some of these programs will not run on the 4D in double-sided mode.)

**Best of the Model 4** —A dozen of the finest programs to appear in 80 Micro. Includes Scripsit enhancement, JCL file editor, Life, window driver, statistics program, project manager, data base manager, III-to-4 Basic converter, utility to let you run TRSDOS 1.3 cassette programs from TRSDOS 6.X disks, DOS setup JCL file, Model 100-like bar cursor directory program, and routine to add Point, Set, and Reset to Basic, (**Note:** some of these programs will not run on the 4D in double-sided mode.)

Complete the coupon or CALL TOLL FREE  
**1-800-258-5473** (In NH, dial 1-924-9471)

Continued from p. 71

press M, the name and a list of marks will appear on the screen. The program then prompts you for a new list of marks. After each new score, press the enter key. End the list by typing - 1 and pressing the enter key again.

The second option on the editing menu lets you edit student marks for a particular assignment. When you select this option, the screen displays the name of the first student on the class roster, along with the total possible score and the actual score earned for each assignment. Above each score is a highlighted number, which stands for the assignment.

Type in the assignment number you want to edit. The program pages through the entire class roster, displaying the total possible score and prompting you for a replacement score for each student. Press the enter key to leave a score unchanged. When you finish, press the E key to return to the main menu.

The procedure for deleting names and marks from a class list is similar. Select option 4 from the main menu and specify the class file from which you want to make the deletions. You will again be shown a submenu with two options, one for deleting names and a second for deleting columns. Highlight the names you want to delete just as you would to edit them. When you're finished, press the N key. The highlighted names will be permanently removed from the list.

The second option produces a column display like the one under the editing function. Select the column you want deleted by typing in one of the highlighted numbers at the top of the screen. Once you specify the column, all marks in it will be permanently deleted. As with other options, press the E key to return to the main menu.

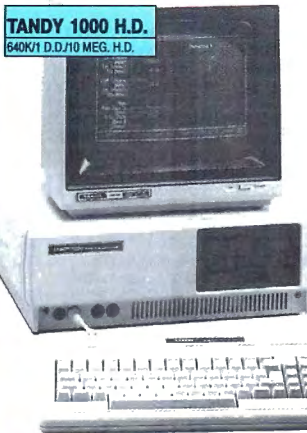
The fifth and sixth options on the main menu are for reading directories and printing class forms. When you read a directory, the program displays all the file names included on your disks. The student-file names include the class name and term number, with the block/period designation appended as the extension. With the print option, you can produce blank forms containing student names and 20 columns for entering marks (see Fig. 2).

### Final Reckonings

Update is an important option accessed from the submenu of the request-output function. It copies student percentages from a current class file to a final one designated term F. With this option, you can keep a term-by-term account of student grades throughout the school year.

To use the update option, you must have a class file printed on screen (option 2 of the main menu). When you press the U key, the program automatically creates a final-term file and alphabetically copies the student names and percentages listed

# SEE WHAT WE OFFER.



**TANDY 1000 H.D.**  
640K/1 D.D./10 MEG. H.D.



**TANDY 1200**  
From \$1098<sup>00</sup>  
256K/2D.D.  
(monitor, etc. not included)

## Someday, our competition will give as much!

**TANDY computers are created equal. . . all retailers are not.**

A good price is, obviously, very important but there are "other important differences" which the buyer should be aware of, before parting with any money.

A good example is "the retailers buy-back policy\*", to insure the buyer against that expensive mistake, "the call free number for easy price comparison and "credit card ordering for convenience and safety. The price quoted should be "the total price with no road-freight charges (to be added later). Under normal circumstances the order should be "shipped the next business day and a "same day rush-service" should be available.

The fact that the majority of orders are from "repeat-buyers is a strong indication of the great satisfaction and trust that our customers feel. However, for those still not convinced we offer "references to prove our bona fides and "that the Radio Shack warranty and service will be available, to our customers, NATIONWIDE.

These eight important considerations will be yours when you order from Fort Worth Computers. Call (free) for a price comparison. \* For a small restocking fee.



**TANDY 2000 H.D.**  
768K/1 D.D./10 MEG. H.D.  
8 MHz CLOCK SPEED



**TANDY 3000 H.D.**  
1 MEG RAM/1 D.D./35 MEG. H.D.  
8 MHz CLOCK SPEED

CUSTOMER SERVICE/QUESTIONS ABOUT  
YOUR ORDER and in TEXAS 1-817-573-4111  
(9 am-5 pm TEXAS TIME MONDAY-FRIDAY)

**Fort Worth Computers**  
377 Plaza  
Granbury, Texas 76048

**FORT WORTH COMPUTERS**  
(WE ARE SERIOUS ABOUT SAVING YOU MONEY)  
Located 30 miles from Ft. Worth

**FOR LATEST PRICES**  
**CALL FREE (1-800) 433-S-A-V-E**

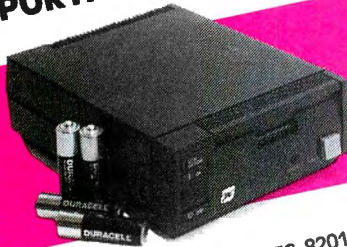
# on the go printer



**\$149.95**

The On-The-Go printer is less than 3 pounds (with batteries), yet its quiet thermal mechanism can run at 40 cps for two hours on battery power! Get shadow printing, underlining and four character types including condensed (160 characters per line)—perfect for spreadsheets. Parallel interface lets it plug into everything from Apples to Zeniths.

## PORTABLE DISK DRIVE



Your Tandy 100/102/200 or NEC 8201 becomes a complete computer with our battery powered disk drive. Comes with POWR-DISK software from Acroatix. Holds 100K per 3.5" disk. Allows saving and loading directly from TEXT to disk-load and save with BASIC commands, and more. **Call.**

## LAPTOPP MEMORY

|                        |                |
|------------------------|----------------|
| 24K for Tandy 200      | \$75           |
| 96K for Tandy 600      | \$249, 2/\$449 |
| 8K Tandy 100, NEC 8201 | \$29, 3/\$75   |

**30-Day Money Back Guarantee**  
 Visa & Mastercard Accepted  
 Include 4% for UPS shipping and insurance.  
 California residents add 6% sales tax.

...DEALER & OEM INQUIRIES INVITED...

California (805) 482-9699  
 Toll Free (800) LAP-TOPP



Laptop Systems - 515 Calle San Pablo  
 Dept. 7, Camarillo, CA 93010

Listing continued

```

INT NAMES$(2);MARKS$(2)
980 PRINT@(12,75);:LINE INPUT KEY$:KEY=VAL(KEY$):PRINT@(14,30),
    "Computer deleting column # ";KEY
990 FOR I=1 TO LOF(1):IF LEN(MARKS$(I))<KEY*S THEN 1010
1000 NUM=(KEY-1)*S;MARKS$(I)=LEFT$(MARKS$(I),NUM)+RIGHT$(MARKS$(
    I),LEN(MARKS$(I))-NUM-S)
1010 NEXT I:GOSUB 1500:GOSUB 1520:GOTO 860
1020 REM * UPDATING ROUTINE *
1030 CLS:PRINT@(15,28),"Copying percentages. . . . ."
1040 FOR I=2 TO LOF(1):RAW(I)=INT(((RAW(I)/RAW(1)*100)+.005)*100
    )/100:NEXT I
1050 RAW(1)=99
1060 OPEN "D",2,CLS+"F"+"/"+BL$,80:FIELD 2,20 AS SNA$,60 AS SMA$
1070 IF LOF(2)=0 THEN FOR I=1 TO LOF(1):LSET SNA$=NAMES$(I):LSET
    SMA$="":PUT 2,I:NEXT I
1080 IF LOF(1)<LOF(2) THEN DIFF=LOF(1)-LOF(2):FOR I=LOF(2)+1 TO
    LOF(2)+DIFF:LSET SNA$=NAMES$(I):LSET SMA$="":PUT 2,I:NEXT
    I:PRINT@(16,20),"Names added to final":SOUND 1,1
1090 FOR I=1 TO LOF(2):GET 2,I:TNAME$(I)=SNA$:TMARK$(I)=SMA$:NEX
    T I
1100 FOR CHECK=1 TO LEN(TMARK$(1)) STEP 6:IF MID$(TMARK$(1),CHEC
    K,6)=SPACE$(6) THEN CHECK=(CHECK-1)/6:DUMMY$="" ELSE
    NEXT CHECK
1110 FOR I=1 TO LOF(2):FOR J=1 TO LEN(TMARK$(I)) STEP 6:IF MID$(
    TMARK$(I),J,6)=SPACE$(6) THEN TMARK$(I)=LEFT$(TMARK$(I),J-
    1) ELSE NEXT J
1120 IF (J-1)/6<CHECK THEN FOR T=1 TO CHECK-((J-1)/6):TMARK$(I)=
    TMARK$(I)+DUMMY$:NEXT T
1130 TMARK$(I)=TMARK$(I)+RIGHT$(STR$(RAW(I)),LEN(STR$(RAW(I)))-1
    )+STRING$(6-LEN(STR$(RAW(I))),1,32):NEXT I
1140 FOR I=2 TO LOF(1):FOR K=I TO LOF(1):IF NAMES$(I)<=NAMES$(K)
    THEN 1150 ELSE SWAP NAMES$(I),NAMES$(K):SWAP MARKS$(I),MAR
    KS$(K)
1150 NEXT K,I
1160 FOR I=2 TO LOF(2):FOR K=I TO LOF(2):IF TNAME$(I)<=TNAME$(K)
    THEN 1170 ELSE SWAP TNAME$(I),TNAME$(K):SWAP TMARK$(I),TMA
    RK$(K)
1170 NEXT K,I
1180 FOR I=1 TO LOF(1):LSET NA$=NAMES$(I):LSET MA$=MARKS$(I):PUT
    1,I:NEXT I
1190 FOR I=1 TO LOF(2):LSET SNA$=TNAME$(I):LSET SMA$=TMARK$(I):P
    UT 2,I:NEXT I
1200 T=VAL(T$)+1:IF T>MAX.TERM THEN 1230 ELSE T$=RIGHT$(STR$(T),
    1)
1210 CLOSE 2:OPEN "D",2,CLS+T$+"F"+BL$,80:FIELD 2,20 AS NNA$,60
    AS NMA$
1220 FOR I=1 TO LOF(1):LSET NNA$=NAMES$(I):LSET NMA$="":PUT 2,I:
    NEXT I
1230 CLOSE:CLEAR:GOTO 50
1240 REM ** DIRECTORY READOUT ***
1250 CLS:PRINT "DIRECTORY PRINTOUT":SPC(10);"CTRL <: > - TO PRINT
    ":PRINT STRING$(80,"=");:SYSTEM "CAT (SORT=YES)":PRINT STR
    ING$(80,"="):LINE INPUT ENTER$:GOTO 60
1260 REM ** MARK FORMS ***
1270 GOSUB 1360:GOSUB 1430:PRINT@(4,0);:PRINT@(5,0),"MARK FORMS
    ":PRINT STRING$(80,95)
1280 PRINT "TURN ON PRINTER, PRESS <ENTER>":GOSUB 1330:PRINT TA
    B(30)"Printing marks form"
1290 WIDTH LPRINT 100:LPRINT CHR$(27);CHR$(23):LPRINT "MARK FORM
    S - VERSION 5.00.00":LPRINT
1300 LPRINT "CLASS :";CL$:SPC(10);"BLOCK :";BL$:SPC(10);"TERM : "
    ;T$:LPRINT:LPRINT "NAMES";TAB(21);"MARKS COLUMN":LPRINT STR
    ING$(80,95)
1310 FOR I=2 TO LOF(1):LPRINT NAMES$(I);:LPRINT CHR$(15);:FOR J=
    1 TO 20:LPRINT "| ";NEXT J:LPRINT CHR$(14):NEXT I:LPRINT
    STRING$(80,"="):LPRINT NAMES$(1);:FOR J=1 TO 20:LPRINT CHR$(
    15);:LPRINT "| ";NEXT J:LPRINT CHR$(14)
1320 FOR I=1 TO 6:LPRINT:NEXT I:LPRINT LOF(1)-1;"STUDENTS":SYSTE
    M "TOP":RUN
1330 KEY$=INPUT$(1):IF KEY$="E" OR KEY$="e" THEN CLS:GOTO 60 ELS
    E IF KEY$="X" THEN CLOSE:CLS:PRINT CHR$(14):END ELSE IF ASC
    (KEY$)>20 THEN SOUND 7,0
1340 RETURN
1350 REM * SUB-MENU SCREEN *
1360 CLS:PRINT DATE$:TAB(33)"M A R K S 4":PRINT TAB(70)"4.00
    .00":PRINT STRING$(80,95);"S U B - M E N U S":PRINT@(22,
    0),IN$
1370 IF NUM$<"4" AND NUM$<"6" THEN 1410
1380 IF STFILE=1 THEN PRINT@(2,40),"CLASS - ";CL$:PRINT@(3,40),"
    BLOCK - ";BL$:PRINT@(4,40),"TERM - ";T$:GOTO 1400
1390 PRINT@(2,40),"CLASS - ";:LINE INPUT CL$:PRINT@(3,40),"BLOCK
    - ";:LINE INPUT BL$:PRINT@(4,40),"TERM - ";:LINE INPUT T$
    :IF LEFT$(T$,1)<>"F" THEN S=3:BEGIN=1 ELSE S=6:BEGIN=2
1400 PRINT@(5,50),CHR$(16)"Shift - Clear for new class ?":CHR$(17
    );:GOSUB 1330:IF KEY$=CHR$(31) THEN STFILE=0:GOTO 1360
1410 RETURN
1420 REM * OPEN STUDENT DATA FILES *
1430 IF STFILE=1 THEN 1480 ELSE GOSUB 1750
1440 CLOSE:OPEN "D",1,CLS+LEFT$(T$,1)+"/"+BL$,80:FIELD 1,20 AS N
    A$,60 AS MA$
1450 FOR I=1 TO LOF(1):GET 1,I:NAMES$(I)=NA$:FOR J=1 TO LEN(MA$)
    STEP S:IF MID$(MA$,J,S)=SPACE$(S) THEN MARKS$(I)=LEFT$(MA$
    ,J-1) ELSE NEXT J
1460 NEXT I
1470 STFILE=1
1480 RETURN
1490 REM * BLANK OUT ROUTINE *
1500 FOR B=8 TO 20:PRINT@(B,0);:NEXT B:RETURN
    
```

Listing continued



# THE BARRIERS ARE BROKEN!



## TS-DOS™

For

TANDY MODELS 100/200 and NEC PC-8201

## LAPDOS™

For

IBM PC, XT, AT and COMPATIBLES

### THE FIRST BARRIER

The Tandy portable disk drive is an amazing little 1¾ pound disk drive that operates on 4 AA batteries. And what is even more amazing is that it costs only \$199. But one thing missing is a true operating system to unleash the power of this product. Without TS-DOS, the Tandy disk drive is a nice and fast replacement for a cassette recorder. With TS-DOS, this disk drive turns your laptop computer into a real powerhouse that can be accessed easily and directly from any BASIC program.

TS-DOS looks exactly like your regular files menu, but now you can do such things as save the complete contents of your computer to disk at once, create files up to 100K in size with the append function, or even view the contents of a disk file without having to transfer it into your computer first. And TS-DOS only occupies 500 bytes when not in use. While using TS-DOS, you will need only 2-5K.

**TS-DOS**  
is Now available  
on a plug-in  
ROM chip!  
call  
**800-343-8080**

### THE SECOND BARRIER

Until now, the Tandy and NEC laptop computers were not easily used with IBM desktop computers. Traveling Software has broken this barrier with a product called "LAPDOS," which allows the Tandy portable 3½" disk drive to be plugged into and used with any IBM PC or compatible with a serial port. LAPDOS can be operated as a RAM-resident utility on your IBM, which means you can call it up with two keystrokes while using your favorite word processor, spreadsheet, or other software. You could be in the middle of Wordstar, for example, and read in any text files from your portable disk drive.

LAPDOS allows you to easily use your database, spreadsheet, or word

processing files while on the road with your Tandy or NEC laptop computer. In fact, LAPDOS includes a program called "The Exchanger" which allows you to use ThinkTank and Sidekick files with the IDEA! outline processor available from Traveling Software on a software chip called The Ultimate ROM II.

LAPDOS is only \$89.95, which includes a special hardware adapter which allows the disk drive to plug into any IBM PC or compatible computer with a serial RS232 port. The LAPDOS software comes on an IBM 5¼" disk with a complete owner's manual. And if you already own the Ultimate ROM II, or are purchasing it now, you will receive a \$20 discount off the cost of LAPDOS.

|   |   |   |
|---|---|---|
| 800/343-8080 or 206/367-8090<br>© 1986 TRAVELING SOFTWARE, INC. | <b>TRAVELING SOFTWARE, INC. 11050 FIFTH AVE. NE, SEATTLE, WA 98125</b>  |   |
|   | OUR PRODUCTS ARE AVAILABLE AT RADIO SHACK STORES & COMPUTER DEALERS NATIONWIDE!                                       |   |
|   | NAME _____  | PLEASE RUSH ME:                         |
|   | SHIPPING ADDRESS _____  | ____ COPIES OF LAPDOS @ <b>\$89.95</b>  |
|   | _____   | ____ COPIES OF TS-DOS @ <b>\$69.95</b>  |
|   | CITY _____  | ____ COPIES OF ROM II @ <b>\$229.95</b> |
|   | STATE _____ ZIP _____   | ROM II DISCOUNT _____                   |
|   | TELEPHONE _____   | SHIPPING <b>\$ 6.00</b>                 |
|   | LAPDOS SYSTEM REQUIREMENTS  | SUBTOTAL _____                          |
|   | 128K IBM PC OR 100% COMPATIBLE COMPUTER WITH RS232 SERIAL PORT  | WA RES TAX ADD 7.9% _____               |
| CIRCLE YOUR LAPTOP TANDY TANDY NEC M100 M200 8201               | AMOUNT ENCLOSED _____   |   |
| WRITTEN PURCHASE ORDERS ACCEPTED                                | VISA <input type="checkbox"/> MC <input type="checkbox"/> COD <input type="checkbox"/> CHECK <input type="checkbox"/> |   |
|   | EXP. DATE _____   |   |
|   | CARD # _____  |   |

Listing continued

```

1510 REM * ROUTING TO WRITE DATA TO STUDENT FILE *
1520 FOR J=1 TO I-1:LSET NA$=NAMES$(J):LSET MA$=MARKS$(J):PUT 1,
J:NEXT J:RETURN
1530 REM * HIGHLIGHTING ROUTINE *
1540 IF C>60 THEN C=0:R=R+1 ELSE IF C<0 THEN C=60:R=R-1
1550 PRINT@(R,C),CHR$(16);NAMES$(I);:GOSUB 1330:PRINT@(R,C),CHR$
(17);NAMES$(I);
1560 IF KEY$=CHR$(9) AND I<L THEN I=I+1:C=C+20:GOTO 1540
1570 IF KEY$=CHR$(10) AND I<=L-4 THEN I=I+4:R=R+1:GOTO 1540
1580 IF KEY$=CHR$(8) AND I>1 THEN I=I-1:C=C-20:GOTO 1540
1590 IF KEY$=CHR$(11) AND I>4 THEN I=I-4:R=R-1:GOTO 1540
1600 IF KEY$=CHR$(13) THEN E=E+1:ED(E)=I:REP$(ED(E))=MID$(NAMES$
(I),19,2):MID$(NAMES$(I),19,2)=" "
1610 IF KEY$="M" OR KEY$="N" THEN RETURN
1620 GOTO 1550
1630 REM ** ROUTINE FOR DETERMNING LETTER GRADES AND FINAL TERM
HEADINGS *
1640 RESTORE 1700:READ START
1650 FOR B=1 TO START:READ FIRST, LAST, GR$
1660 IF FIRST<=TTL AND TTL<LAST THEN 1680
1670 NEXT B
1680 GR(B)=GR(B)+1:RETURN
1690 DATA "TERM :1", "MD-TERM", "TERM :2", "TERM :3", "FIN-EXM"
1700 DATA 8,87,101,"A ",74,87,"B ",66,74,"C+",60,66,"C ",53,60,"
C-",40,53,"D ",19,40,"E ",0,19,"I "
1710 REM * ROUTINE FOR WHEN SCORES WRAP AROUND SCREEN WIDTH *
1720 IF LEN(MARKS$(I))>48 THEN PRINT TAB(20);
1730 RETURN
1740 REM * ROUTINE FOR CLEARING ARRAYS *
1750 ERASE NAMES$, MARKS$, RAW, GR, REP$, ED, TMARK$, TNAME$:DIM NAMES$
(50), MARKS$(50), RAW(50), GR(10), REP$(50), ED(50), TMARK$(50), T
NAME$(50):RETURN

```

End



Photo. Mark4's main menu.

for the current term into it. Once you've created a final-term file, you can access it from any option on the main menu by specifying F at the Term prompt.

When displayed, the final-term file contains six columns with the following headings: "TERM :1," "MID-TERM," "TERM :2," "TERM :3," "FIN-EXM," and "LET-GRD." The program automatically creates templates for the three terms, using the student names listed in the current class file.

When you use the update option, it automatically copies percentages into the appropriate column. Marks for the mid-year and final exams can be entered manually by selecting option 1 from the main menu. The letter grade is a calculated average of the first five columns.

A printout of the final-term file contains seven columns: the six contained in the on-screen display plus a seventh that lists percent averages (see Fig. 3).

### Structural Changes

You can modify the program to make it conform to the grading system used by your school. Say, for instance, you need to change the point range represented by a letter grade. Line 1700 of the program contains the Data statements that determine this. For example, as I've written the program, a student will receive an A if his or her percentage is greater than or equal to 87 and less than 101. To receive a B, the student must earn a percentage that is less than 87 and greater than or equal to 74. To change the range for each letter, simply alter the high and low numbers for the appropriate grade.

What if your school doesn't break down its school year and grading system into five categories? To correct this, simply change the headings in line 1690. Then change the variable TERM in line 60 to whatever number applies to your school. If necessary, you can change the variable MAX.TERM in the same line. This will guarantee that the final-term file will contain the appropriate number of terms for your school.

Though written for the Model 4, the program will also work on the Tandy 1000. Following is a list of required modifications:

| DATE :06/13/86       | CLASS :TECH12                      | BLOCK :G | TERM :1 |
|----------------------|------------------------------------|----------|---------|
| BELANGER, GEORGE     | 90 30 70 70 260                    | 74.29%   | B       |
| CAYENS, STAN         | 85 30 65 80 260                    | 74.29%   | B       |
| CERNY, STACEY        | 90 30 56 0 176                     | 50.29%   | D       |
| FAULKNER, GARY       | 98 49 90 89 326                    | 93.14%   | A       |
| FINHOLM, ERIK        | 90 45 95 93 323                    | 92.29%   | A       |
| JOHNSON, CLINT       | 75 45 87 95 302                    | 86.29%   | B       |
| MCGHEE, DWAYNE       | 100 50 43 98 291                   | 83.14%   | B       |
| OLSON, JEFF          | 99 32 78 95 304                    | 86.86%   | B       |
| PETERSON, DIANNE     | 91 30 80 93 294                    | 84.00%   | B       |
| PRESS, KEVIN         | 92 47 56 81 276                    | 78.86%   | B       |
| RASCHER, RICKIE      | 94 49 45 76 264                    | 75.43%   | B       |
| SCHELLER, SHANE      | 87 30 90 61 268                    | 76.57%   | B       |
| SILVERSIDES, RALPH   | 94 32 85 0 211                     | 60.29%   | C       |
| TURNER, JIM          | 98 50 85 89 322                    | 92.00%   | A       |
| ANDERSON, SUE        | 80 40 80 70 270                    | 77.14%   | B       |
| TOTAL                | 10050 100100350                    |          |         |
| AVERAGE :78.99%      |                                    |          |         |
| MARKS DISTRIBUTION : | A 3 B 10 C+ 0 C 1 C- 0 D 1 E 0 I 0 |          |         |

Fig. 1. To print class scores on screen, press H from the submenu of the request-output function.

| CLASS :TECH12      | BLOCK :G     | TERM :3 |
|--------------------|--------------|---------|
| NAMES              | MARKS COLUMN |         |
| BELANGER, GINGER   |              |         |
| CAYENS, STEVE      |              |         |
| CERNY, STACEY      |              |         |
| FAULKNER, GARY     |              |         |
| FINHOLM, ERIK      |              |         |
| JOHNSON, CLINT     |              |         |
| MCGHEE, DWAYNE     |              |         |
| OLSON, JEFF        |              |         |
| PETERSON, DIANNE   |              |         |
| PRESS, KEVIN       |              |         |
| SCHELLER, SHANE    |              |         |
| SILVERSIDES, RALPH |              |         |
| TURNER, JIM        |              |         |
| TOTAL              |              |         |

13 STUDENTS

Fig. 2. With the print option, you can produce blank forms for recording student names and grades.

MARKS REPORT - VERSION 4.00.00

| DATE :06/13/86     | TERM :1 | MD-TERM | TERM :2 | TERM :3 | FIN-EXM | GRD | FIN-MRK |
|--------------------|---------|---------|---------|---------|---------|-----|---------|
| BELANGER, GINGER   | 174.29% | 190.00% | 199.00% | 190.00% | 150.00% | B   | 80.66%  |
| CAYENS, STEVE      | 174.29% | 188.67% | 145.00% | 188.67% | 174.44% | B   | 74.21%  |
| CERNY, STACEY      | 148.57% | 178.67% | 134.00% | 178.67% | 197.78% | C+  | 67.54%  |
| FAULKNER, GARY     | 193.14% | 186.00% | 156.00% | 186.00% | 198.89% | B   | 84.01%  |
| FINHOLM, ERIK      | 192.29% | 181.33% | 177.00% | 181.33% | 185.56% | B   | 83.50%  |
| JOHNSON, CLINT     | 186.29% | 176.67% | 166.00% | 176.67% | 173.33% | B   | 75.79%  |
| MCGHEE, DWAYNE     | 183.14% | 168.67% | 155.00% | 168.67% | 185.56% | C+  | 72.21%  |
| OLSON, JEFF        | 186.86% | 177.33% | 144.00% | 177.33% | 197.78% | B   | 76.66%  |
| PETERSON, DIANNE   | 184.00% | 186.00% | 133.00% | 186.00% | 197.78% | B   | 77.36%  |
| PRESS, KEVIN       | 178.86% | 184.00% | 134.00% | 184.00% | 198.89% | B   | 75.95%  |
| RASCHER, RICKIE    | 175.00% | 143.00% | 186.00% | 167.00% | 186.00% | C+  | 71.40%  |
| SCHELLER, SHANE    | 176.57% | 189.33% | 188.00% | 189.33% | 197.78% | A   | 88.20%  |
| SILVERSIDES, RALPH | 160.29% | 198.67% | 177.00% | 198.67% | 174.44% | B   | 81.81%  |
| TURNER, JIM        | 192.00% | 166.67% | 166.00% | 166.67% | 197.78% | B   | 77.82%  |

=====  
 CLASS :TECH12                      BLOCK :G  
 MARKS DISTRIBUTION :     A     B     C+     C     C-     D     E     I  
                                  1     10     3     0     0     0     0     0

Fig. 3. A sample final-term file.

- Change all PRINT@(x,y) locations to LOCATE and add 1 to all column locations.
- Change the variable TERM to TERMS; likewise, change the variable KEY to KEYS.
- Insert PRINT STRING\$ (80," ") after the LOCATE statement in line 1500.
- Change SYSTEM"TOF" to LPRINT CHR\$(12).
- Change all occurrences of C>60 to C>61.
- Change SYSTEM "DIR" to FILES.
- Divide all LOF( ) by 80.
- Make sure that all file-name extensions

- are preceded with a period instead of a slash.
- Change "D" to "R" in all Open statements.
- Remove reverse-video control codes CHR\$(16) and CHR\$(17).
- Use Color 0,7 and Color 7,0 in line 1550 to reverse the video.
- Use shift-print instead of control-: to print to the screen.
- Use the control-underline key combination in place of shift-clear.
- Use the tab key to move the cursor.

One last word of advice whether you run the program on a Model 4 or a Tandy 1000: If you have access to a scroll-protection routine, you might want to use it to protect the top seven or eight lines. This will help keep screen headings intact. On the Tandy 1000, you can use the View Print statement. ■

*Orest Kowalyszyn is a high-school teacher and computer hobbyist. You can write to him at P.O. Box 1634, Fernie, British Columbia V0B 1M0.*

★ **ComputAmerica** ★  
**1-800-262-3111**

For all IBM peripherals, hardware, and software, we have the best prices.

**WE WILL BEAT ANYBODY'S PRICE!**

We also carry a full line of Apple, AMIGA and Commodore software.

Call us for any of your software needs. If we don't have it, we will order it.

Immediate shipping. We accept all major credit cards.

**1-800-262-3111**

IBM software and hardware at the lowest prices in the country.

**ComputAmerica**  
**1111 Spring Hill Ave.**  
**Mobile, AL 36605**  
**205-438-3476**

Circle 242 on Reader Service card.

POP QUIZ

**MASTER/CARD™**  
**FOR YOUR TANDY 1000**

- The 1 million byte memory multifunction board that lets your Tandy 1000 grow and grow.
- Expandable to handle today's AND tomorrow's high-powered software.
- Unlike many other boards, **MASTER/CARD™** comes with all memory chips installed and factory tested.
- Includes DMA, BATTERY POWERED CLOCK, RS-232 port with COM 1, COM 2 or disabling capabilities.
- Comes with back-bank RAM disk and software that addresses 768 K of memory with expansion capabilities up to 32 MEGS.
- Print spooling and EMS emulation software are included with every board.
- Can be used with Tandy's memory board. Circle 238 on Reader Service card.



**CALL 1-800-543-2233**

In CA 1-805-684-5464

Ask for **MASTER/CARD™** customer service. Factory trained technicians are on call.

**AFC**

Automation Facilities Corp.  
 6383 Rose Lane,  
 Carpinteria, CA 93013

**MASTER/CARD™ Don't boot up without us!**

Tandy is a reg trademark of Tandy Corporation.

# Gone Without a Trace

Make sure that "deleted" files don't ever come back to haunt you.

It's no secret that trying to kill a file by issuing a Remove command from TRS-DOS Ready doesn't really erase the information on the disk; it merely rearranges the directory to let you use the space for a new file that writes over the old material.

This arrangement allows resurrecting files you didn't mean to kill (see "Files from the Crypt," October 1985, p. 58, and "Bring 'Em Back Alive," July 1986, p. 60). But what if you want to be sure a confidential file has been erased? There's no easy way to do this, short of destroying the disk with the Format command. I've written a program that fills the space occupied by a file with zeros before TRSDOS removes the file from the directory, rendering its recovery impossible.

## Clapping the Erasers

Erase/BAS (Program Listing 1) creates a machine-language file called Erase/CMD to replace the Remove command. At TRS-DOS Ready, type ERASE file name/Ext:d, in which d represents the drive number. If you invoke Erase/BAS without specifying a file name, the program will prompt you to supply one. You may run the source code shown in Program Listing 2 instead of Erase/BAS.

If for some reason you want to fill a file with zeros but don't want to remove it from disk, type the following patch from TRSDOS Ready:

```
PATCH ERASE/CMD (X'8A88' = 000000)
```

To fill erased files with a different character, type:

```
PATCH ERASE/CMD (X'89A1' = bb)
```

where bb is the hexadecimal ASCII code of the new character.

To reverse the preceding patches, run the program again to reassemble the Erase/CMD file.

## Perils of Promiscuity

Home-computer users care little whether a file has really been deleted from

Program Listing 1. Erase/BAS. (See p. 112 for information on using the checksums in this listing.)

```
12 DATA 5,9,0,184,136,32,32,32,32,32,32,1,138,184,136,69,82,65      '* 3108
13 DATA 83,69,32,32,49,46,48,46,49,32,45,32,67,111,112,121,114,105    '* 3311
14 DATA 103,104,116,32,49,57,56,54,32,98,121,32,74,97,99,113,117,101    '* 3418
15 DATA 115,32,76,46,32,82,111,98,105,116,97,105,108,108,101,44,32    '* 3307
16 DATA 97,108,108,32,114,105,103,104,116,115,32,114,101,115,101,114  '* 3372
17 DATA 118,101,100,46,13,89,69,83,32,13,78,79,32,45,32,65,98,111    '* 3278
18 DATA 114,116,13,16,70,105,108,101,32,116,111,32,69,82,65,83,69,58  '* 3408
19 DATA 17,32,3,79,46,75,46,32,84,79,32,80,82,79,67,69,69,68,63,32   '* 3367
20 DATA 40,89,47,78,41,58,32,3,1,9,66,137,82,69,77,79,86,69,32,1,3   '* 3347
21 DATA 88,137,13,1,254,123,137,48,48,48,48,48,32,82,101,99,111,114   '* 3373
22 DATA 100,115,32,101,114,97,115,101,100,46,13,229,6,4,33,184      '* 3081
23 DATA 136,62,10,239,33,160,140,17,0,0,54,0,229,19,98,107,125,254    '* 3298
24 DATA 0,40,4,225,35,24,241,225,14,13,62,2,239,225,126,254,13,40    '* 3233
25 DATA 10,14,0,17,73,137,237,176,24,27,33,21,137,62,10,239,33      '* 3195
26 DATA 73,137,6,14,14,0,62,9,239,62,106,239,194,150,138,14,13,62   '* 3264
27 DATA 2,239,33,39,137,62,10,239,62,1,239,254,89,40,13,254,121,40  '* 3313
28 DATA 9,33,10,137,62,10,239,195,150,138,33,5,137,62,10,239,33,73  '* 3312
29 DATA 137,17,89,137,62,78,239,33,160,140,17,89,137,6,0,62,59,239  '* 3349
30 DATA 194,144,138,17,89,137,62,64,239,62,0,185,202,125,138,96,105  '* 3383
31 DATA 237,67,121,137,6,4,62,15,239,62,23,188,40,58,36,34,64,137,17 '* 3424
32 DATA 89,137,33,160,140,62,75,239,194,144,138,42,64,137,6,3,62,15 '* 3376
33 DATA 239,17,89,137,62,63,239,197,96,105,17,123,137,62,97,239,33  '* 3356
34 DATA 123,137,62,10,239,193,42,121,137,229,183,237,66,225,40,18,24 '* 3416
35 DATA 202,14,13,62,2,239,14,13,62,2,239,1,34,119,138,37,34,64,137 '* 3349
36 DATA 24,186,17,89,137,62,60,239,14,13,62,2,239,33,66,137,62,25  '* 3281
37 DATA 239,24,6,79,203,241,62,26,239,201,2,2,145,137              '* 2672
38 CLS:FOR T%=1 TO 463 : READ A:TTL=TTL+A:NEXT T%                       '* 3049
39 IF TTL<> 397741 THEN PRINT"CHECKSUM ERROR: "TTL: END              '* 3508
40 PRINT"WRITING FILE TO DISK" : OPEN"O",#1,"ERASE/CMD"             '* 3401
41 RESTORE:FOR T%=1 TO 463 : READ A:PRINT #1, CHR$(A);:NEXT T%:CLOSE '* 4191
42 PRINT:PRINT"FILE 'ERASE/CMD' NOW READY.":SYSTEM                  '* 1308
```

End

Program Listing 2. Erase/BAS source code.

```
                PSECT 35000
IDMESS DEFM 'ERASE 1.0.1 - by Jacques L. Robitaille'
                DEFB 13
MESS1 DEFM 'YES '
                DEFB 13
MESS2 DEFM 'NO - Abort'
                DEFB 13
MESS3 DEFM 'File to ERASE:'
                DEFB 17
                DEFB ' '
                DEFB 03
MESS4 DEFM 'O.K. TO PROCEED? (Y/N): '
                DEFB 03
POS DEFMS 2
COMMAND DEFM 'REMOVE '
FILE DEFMS 15
                DEFB 13
FCB DEFMS 32
EOF DEFMS 2
FNUM DEFM '00000'
                DEFM ' Records erased.'
                DEFB 13
START PUSH HL
                LD B,4
                LD HL,IDMESS
                SVC 10
                LD HL,36000
                LD DE,0
FIL LD (HL),0
                PUSH HL
                INC DE
                LD HL,DE
                LD A,L
                CP 0
                JR Z,TEST
                POP HL
                INC HL
                JR FIL
TEST POP HL
                LD C,13
                SVC 2
                POP HL
                LD A,(HL+6)
```

Listing 2 continued



## System Requirements

Models 4/4P/4D

64K RAM

Basic

Editor/assembler (optional)

disk or is still lying around, hidden in unassigned records. Office workers, on the other hand, sometimes use passwords to protect confidential information. They're probably unaware that the material is readily available to anyone familiar with the disk input function of Radio Shack's Debug utility.

Even worse, SuperScriptit has a peculiar way of managing disk files: It often embeds deleted material in active text files. The unwanted data isn't usually visible during text editing, but it may appear when you list a file.

A personal anecdote best illustrates the point. In our office, we frequently swap disks between several Model 4's and 4Ps used for word processing. Recently, a staff member received a parity error message while using SuperScriptit to open a text file that had been transferred from a colleague. Naturally, he listed the file to see where the error occurred.

Surprise! Embedded in the text were two paragraphs of a very personal letter written by a third colleague several months earlier. ■

You can contact Jacques L. Robitaille at 1328 Martgold Crescent, Gloucester, Ontario, Canada K1B 5E5.

Listing 2 continued

```

CP      13
JR      Z,GETNAME
LD      BC,14
LD      DE,FILE
LDIR
GETNAME LD      WARNING
        LD      HL,MESS3
        SVC     10
        LD      HL,FILE
        LD      B,14
        LD      C,0
        SVC     9
        SVC     106
        JP      NZ,STOP
        LD      C,13
        SVC     2
WARNING LD      HL,MESS4
        SVC     10
        SVC     1
        CP      'Y'
        JR      Z,PT2
        CP      'y'
        JR      Z,PT2
        LD      HL,MESS2
        SVC     10
        JP      STOP
PT2     LD      HL,MESS1
        SVC     10
        LD      HL,FILE
        LD      DE,FCB
        SVC     78
        LD      HL,36000
        LD      DE,FCB
        LD      B,0
        SVC     59
        JP      NZ,ERROR
        LD      DE,FCB
        SVC     64
        LD      A,0
        CP      C
        JP      Z,ENDOF
        LD      HL,BC
        LD      (EOF),BC
        LD      B,4

```

```

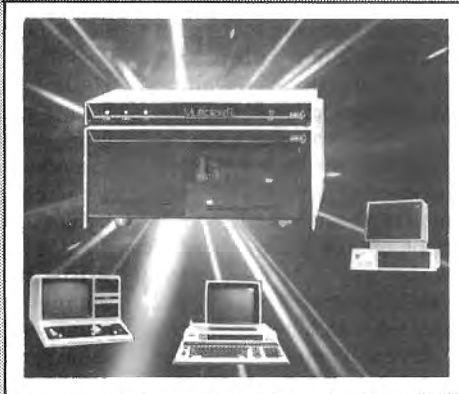
SVC     15
LD      A,23
CP      H
JR      Z,ERASE
INC     H
LD      (POS),HL
PT3     LD      DE,FCB
        LD      HL,36000
        SVC     75
        JP      NZ,ERROR
        LD      HL,(POS)
        LD      B,3
        SVC     15
        LD      DE,FCB
        SVC     63
        PUSH   BC
        LD      HL,BC
        LD      DE,FNUM
        SVC     97
        LD      HL,FNUM
        LD      B,0
        POP    BC
        LD      HL,(EOF)
        CPR    BC
        JR      Z,ENDOF
        JR      PT3
ERASE   LD      C,13
        LD      B,2
        LD      C,13
        LD      B,2
        DEC    H
        LD      (POS),HL
        JR      PT3
ENDOF   LD      DE,FCB
        SVC     60
        LD      C,13
        SVC     2
        LD      HL,COMMAND
        SVC     25
        JR      STOP
ERROR   LD      C,A
        SET    6,C
        SVC     26
STOP    RET
        END    START

```

End

Circle 300 on Reader Service card.

# The Bi-Tech Hard Disk Drives



## & Star Network

Able to link 8 computers to a Hard Drive System

IBM PC, XT, AT • Compaq • AT&T 6300 • Columbia • Corona • Eagle • TI Professional • Zenith • Televideo • IBM Compatibles  
Tandy Models I, III/4, 2/12/16, 1000, 1200, 2000 •  
Epson QX-10/16, Equity I, II, III • NEC APC III

**RADIO SHACK MODEL FEATURES:**

- 10 Megabyte Removable Cartridge
- 10-60 Megabytes Drive
- Multiple Operating System Segments
- Variable Segment Size Capability

**MODEL I/III/4 SYSTEMS —**

- DosPlus 3.5 & DosPlus 4
- LDos 5.1
- TRSDOS 6
- CP/M — Hard Disk Support

**MODEL III/12 SYSTEMS —**

- DP 11
- TRSDOS 2.0 with Racet HSDS
- CPM — Hard Disk Support

**MODEL 16 —**

- Xenix Support

**MODEL 1000/1200/2000 —**

- MS-DOS, PC-DOS

## ★ ★ The Long Island Built PC ★ ★

### The Bi-Tech PC and Turbo PC

Fully IBM PC/XT compatible

PC computer includes:

- 640 k Memory
- Parallel & Serial Ports
- Calendar Clock — Date/Time
- AT Style Keyboard
- 135 Watt Supply
- 8 Card Slots (6 unused/5 XT)

- Monochrome & Color Monitors available

**Complete 10meg- mono system \$1495.**

### Tandy

### Internal Hard Disk Upgrade Kits

Includes: Controller, Drive, Cables & Manual

**1000/1200**

- 10 meg ..... \$495.00
- 20 meg ..... \$625.00

**3000 — Voice Coil Drives**

- 40 meg \* ..... \$1495.00
- 70 meg \* ..... \$2195.00

\* Controller additional

### External Hard Drives

1000/1200/2000/3000

- 10 meg. .... \$ 995.00
- 20 meg. .... \$1295.00
- 30 meg. .... \$1495.00
- 40 meg. .... \$1795.00
- 10 meg. removable .. \$1695.00



B.T. Enterprises  
10 Carrough Road  
Bohemia, NY 11716-2996  
(516) 567-8155 (800) 645-1165

REFER TO DEPT. 11

All prices subject to change without notice.  
All prices above include 2% cash discount.  
Credit card customers add 2% to prices.  
Add \$4.00 shipping & handling on all prepaid orders.  
Add \$7.00 shipping & handling on C.O.D. orders.  
MasterCard/Visa

# Brain Breakers

Solve these long-division puzzles by replacing dummy letters with valid numbers.

Once avoided by young and old alike, long-division problems now form the basis for a popular puzzle, where letters replace numbers in the dividend, quotient, and divisor. Your job is to replace the letters with digits and come up with the right solution.

My program, Long Division, creates this kind of puzzle for you (see the Program Listing). Besides requiring some clever logic and a certain amount of trial and error, Long Division lets you rediscover the rudiments of arithmetic—addition, subtraction, multiplication, and division. The program, as listed, runs on all Model 4 computers. Figure 1 lists changes necessary for it to run on the Model I/III and Tandy 1000 computers.

## Ground Rules

Long Division gives you a choice of two types of puzzles at four playing levels (three on the Model I/III). In the first puzzle form, a substitution problem, the entire puzzle is comprised of letters for which you must find the appropriate numbers (see Fig. 2). The second puzzle form, a fill-in, displays both letters and a smattering of the correct digits (see Fig. 3).

Long Division's playing levels are deceiving. Level 1 always produces a short puzzle, just as level 4 consistently produces a long one. But the size of the puzzle is inversely proportional to the solution time. A short substitution puzzle, for example, is the most difficult form to solve because of the paucity of supplied information. The long fill-in puzzle, though difficult, is easier to handle because of the abundance of information initially provided.

Once you choose your puzzle type and playing level, the program displays the puzzle, reminds you of the puzzle form, and gives you a reference number repre-

```

Model I/III
Change line 70 to:
70 CLEAR 3000:TC = 32:TB = 21:W = 64:ML = 3:CM = 48:RW = 0:MS = 14:
  SS = 10

Model 1000/1200/2000/3000 GW-Basic
Replace lines 80, 340, and 380 as follows:
80 RANDOMIZE TIMER:L$ = CHR$(95):LL$ = L$:V$ = " ) ":V = 41:L = 95:
  BL$ = " "
340 R = INT(RND*RD) + 1:RANDOMIZE TIMER:RETURN
380 LOCATE XX + 1,YY + 1:RETURN
    
```

Fig. 1. Line changes necessary for Long Division to run on the Model I/III and Tandy 1000 computers.

sending the fewest possible moves in which you could solve the puzzle.

For each move, Long Division gives you a choice of three responses. Entering a slash lets you see the puzzle in its original form; enter another slash to return to the solution in progress. Entering a question mark gives you the solution to the puzzle. Typing a letter indicates that you want to solve for that particular letter of the puzzle. This last response generates a second prompt with two choices: Input the letter's numerical value or press the R key to change the value of a previous guess. You can input and change any letter's value as often as you wish.

Long Division indicates which response you selected with a label near the bottom of the screen. If you choose to see the original puzzle, the display indicates this with the message, "Original puzzle." If you're working on the solution, the program displays, "Current solution." The "Solved" message is strictly informational as it displays the letters that you've replaced with numbers. The program doesn't comment on the accuracy of these values.

## Strategic Suggestions

The substitution puzzle in Fig. 2 might baffle you initially, but don't be discouraged. By studying the puzzle, you can detect trends and hints. First, you know that neither I, A, nor E equals one because for that to be true, one of the intermediate products (WAYEE or LQBOE) would have to be the same as the divisor, IYBO.

With this realization, a more important fact surfaces: The puzzle has only two


products. Because the quotient has three digits, you'd expect three products. Yet, to make the number large enough so that IYBO can divide it, you must bring down two digits from the dividend. Whenever this happens, a zero appears in the quotient. Therefore, A = 0.

Substituting a zero for all A's in the puzzle is helpful. Doing so, you find that E + L = 10, because when you subtract E from zero (in the lower-right corner), L is the result. Similarly, you can be somewhat confident that O + I = 9 and that L + Q = 9. Continuing with this same deductive process reveals that I = L + 1. This is true because you had to borrow from the first I, and subtracting L from the diminished I yields nothing. Applying this same reasoning, B probably equals E + 1.

When you start to accumulate information, it's a good idea to use a chart or scale to keep track of the possible solutions. As you play around with these values, you become more certain of the possible solution.

## Fill-In Puzzles

Conquering a fill-in puzzle requires much of the same type of thinking that the



**System Requirements**

**Model 4/4P/4D**  
**Model I/III/1000 with changes**  
**32K RAM**  
**Basic**

|      |   |               |           |       |
|------|---|---------------|-----------|-------|
|      |   |               |           | I A E |
| IYBO | ) | W A Q B W A A |           |       |
|      |   | W A Y E E     |           |       |
|      |   |               | I A I A A |       |
|      |   |               | L Q B O E |       |
|      |   |               | L I I L   |       |

Fig. 2. Substitution puzzle.

# PRINTER SALE

## CANON LASER PRINTER

# \$1999

 ■ \*THE PRICE SAYS IT ALL.

## THE STATE OF THE ART

The C.I.TOH 3500 is fully IBM/Tandy 1000-1200-2000 compatible and FAST. Using bidirectional, logic-seeking printing across a full width of 13.2 inches, this little beauty prints at a speed of 350 characters per second (CPS). Letter quality printing is available at a rapid 87 CPS—more than twice the speed of most daisywheel printers. Couple that with a quick linefeed of 30 milliseconds per line and a standard buffer of 2K (16K optional, \$50) and you have just about the fastest throughput around. Only 4.7" high and a low noise level of 58 dBA.

Maximum versatility is offered for data and wordprocessing output, spreadsheets and business graphics by a variability of print densities, speeds, character sets and fonts, spacing, forms control and other attributes realized by operator and computer alterable functions, allowing the printer to be tailored to almost any application.

We could rave on and on about this fantastic printer but the proof is using this printer in your application. Try it on our 14 day money-back-if-not-satisfied plan. Don't be printer bound any longer. Call today.



### 350 CPS only \$1295

(Please Specify Serial or Parallel)  
(Shipping Included)

**ORDER TODAY**  
CALL TOLL FREE **800-527-0347/800-442-1310**



# MONTEZUMA MICRO

P.O. Box 32027  
Redbird Airport, Hangar #8  
Dallas, TX 75232  
214-339-5104



**Step 1**

```

      4 8 4
112 ) ABCDE
     FGH

```

**Step 2**

```

     IJK
     8LM
     N60
     44P
112 ) ABCDE
     448

```

**Step 3**

```

     IQ
     484
112 ) 542DE
     448
     IJK
     896
     N60
     448
     IQ

```

Fig. 3. Fill-in puzzle.

substitution form requires, but with a few notable twists. The exposed digits provide the information that helps you get from one blank to the next. As this is a fill-in puzzle, each letter appears only once, and several letters can represent the same value.

Be sure to keep track of all carries and borrows. Figure 3 illustrates the step-by-step process required to solve a fill-in problem. Getting from step 1 to step 2 is easy—a matter of simple multiplication. The path from step 2 to step 3, however, is more obscure. You know that ABCDE = 484 × 112 + IQ. Because IQ can have a range of only 10 to 19, ABCDE has a possible range of 54,218 to 54,227, resulting in step 3.

After each move, the program checks to see if you've solved the puzzle. If so, you'll be congratulated and then graded. Your score is a percentage based on the number of attempts made in solving the puzzle. You can delete this feature by removing line 1860 from the Listing.

Whether you solve the problem or give up, Long Division lets you view the original problem, your current solution, and the official answer. This feature gives you the opportunity to study both the puzzle and the technique used to find the solution. When you're ready to test your skills on a new puzzle, just return to the selection menu. ■

Write to Harry Bee at RFD #1, Box 233, Cornish, ME 04020.

**Related Articles**

Cecil, David. "Long, Long Division," Anniversary Issue 1983, p. 284. Generates long-division problems to test your math skills.

Wirth, Ross A. "Digits for Fun," August 1983, p. 304. A brain teaser based on number problems.

**Program Listing. Long Division. (See p. 112 for information on using the checksums in this listing.)**

```

10 CLEAR:TC=40:TB=33:W=80:ML=4:CM=56:RW=2:MS=21:SS=18
20 RANDOM:LS=CHR$(140):LL$=CHR$(188):L=140:V=186:VS=CHR$(32)+CHR
$(186)+CHR$(32):PRINT CHR$(15);:BL$=CHR$(14)
30 DIM AS$(18),DS$(18),GS$(18),DP$(18),GM$(3),SS$(26),DP$(2)
40 MV$="Move?":GM$(1)="Substitution":GM$(2)="Fill-in":GM$(3)="E
nd":QM$=""
50 DP$(0)="Current Solution":DP$(1)="Original Puzzle":DP$(2)="A
nswer":PR$=STRING$(SS,32)+"<A>nswer - <P>puzzle - <S
>olution - <R>eplay"+STRING$(SS,32)
60 CLS:PRINT TAB(TC-2)"LONG":PRINT STRING$(W,LS);:PRINT TAB(TC-4
)"DIVISION"
70 PRINT:PRINT TAB(TB)"Puzzle Selection":PRINT:FOR X=1 TO 3:PRIN
T TAB(TB-1)X;GM$(X):NEXT X:PRINT:PRINT TAB(TB)"Type number":P
RINT
80 GOSUB 110:IF I<1 OR I>3 THEN 80 ELSE IF I=3 THEN 1010
90 GM=I:PRINT GM$(GM):PRINT"Level ( 1 -";ML;")?"
100 GOSUB 110:IF I<1 OR I>ML THEN 100 ELSE LV=I:PRINT "Generatin
g a level":LV;"puzzle...":GOTO 260
110 I$=INKEY$:IF I$="" THEN 110 ELSE I=VAL(I$):RETURN
120 R=RND(RD):RETURN
130 FOR TM=1 TO 500:NEXT TM:RETURN
140 XX=RM+X:YY=DP(X)
150 PRINT @ XX*W+YY,;:RETURN
160 N#=0:RD=10:FOR X=1 TO T:GOSUB 120:N#=#*10+R-1:NEXT X
170 X$=RIGHT$(STR$(N#),LEN(STR$(N#))-1):TR=LEN(X$):RETURN
180 Y$="" :IF TR=1 THEN Y$=X$:RETURN
190 FOR Y=1 TO TR-1:Y$=Y$+MID$(X$,Y,1)+ " " :NEXT Y:Y$=Y$+RIGHT$(X
$,1):TR=TR*2-1:RETURN
200 NB=CH:OK=INT(CH/2):X=1:RD=CH
210 Y=INSTR(X,X$,QM$):IF Y THEN X=Y+1:NB=NB-1:IF X<=LEN(X$) THEN
210
220 IF NB>=OK THEN RETURN
230 FOR X=1 TO LEN(X$) STEP 2
240 IF MID$(X$,X,1)=QM$ THEN GOSUB 120:IF R=1 THEN MID$(X$,X)=MI
D$(Y$,X,1):NB=NB+1:NQ=NQ-1
250 NEXT X:GOTO 220
260 T=LV+1:GOSUB 160:IF TR<2 THEN 260 ELSE Q=N#:Q$=X$:LQ=TR
270 RD=LV+1:GOSUB 120:T=R+1:GOSUB 160:IF TR<2 THEN 270 ELSE DV=N
#:DV$=X$:LI=TR
280 IF DV>32767 THEN RD=32767 ELSE RD=DV
290 GOSUB 120:N#=#*DV+R-1:GOSUB 170:DD$=N#:DD$=X$:LD=TR
300 FOR X=1 TO LQ:M=VAL(MID$(Q$,X,1))
310 IF M=0 THEN M(X)=M:M$(X)="" ELSE N#=#*DV:GOSUB 170:M(X)=N#:M
$(X)=X$
320 NEXT X:LS=LEN(M$(1)):PM(1)=0
330 S=VAL(LEFT$(DD$,LS)):IF S<M(1) THEN LS=LS+1:PM(1)=PM(1)+1:GO
TO 330
340 N#=#-M(1):GOSUB 170:R$=X$:PR(1)=LS-TR:FOR X=2 TO LQ
350 LS=LS+1:R$=R$+MID$(DD$,LS,1):R=VAL(R$):IF M(X)>R THEN 350
360 R$(X-1)=R$:N#=#-R(X):GOSUB 170:R$=X$:PR(X)=LS-TR:PM(X)=LS-LE
N(M$(X)):NEXT X:R$(LQ)=R$
370 X$=Q$:TR=LQ:GOSUB 180:Q$=Y$:X$=DV$:TR=LI:GOSUB 180:DV$=Y$:LI
=TR:X$=DD$:TR=LD:GOSUB 180:DD$=Y$:LD=TR
380 FOR X=1 TO LQ:IF M$(X)="" THEN 400
390 X$=M$(X):TR=LEN(X$):GOSUB 180:M$(X)=Y$:PM(X)=PM(X)*2
400 X$=R$(X):TR=LEN(X$):GOSUB 180:R$(X)=Y$:PR(X)=PR(X)*2:NEXT X
410 A$(0)=Q$:A$(1)=LL$+STRING$(LD+1,L$):A$(2)=DV$+V$+DD$:ND=1:SP
420 FOR X=1 TO LQ:IF M$(X)="" THEN SP=LD-LEN(R$(X))-PR(X):A$(ND-
1)=R$(X)+STRING$(SP,32):GOTO 440
430 SP=LD-LEN(M$(X))-PM(X):A$(ND)=M$(X)+STRING$(SP,32):ND=ND+1:L
M=LEN(M$(X)):A$(ND)=STRING$(LM,LS)+STRING$(SP,32):ND=ND+1:SP
=LD-LEN(R$(X))-PR(X):A$(ND)=R$(X)+STRING$(SP,32):ND=ND+1
440 NEXT X:ND=ND-1
450 RM=RW+2*(ML-LV):FOR X=0 TO ND:DP(X)=CM-LEN(A$(X)):NEXT X:VL$
="" :ON GM GOSUB 610,690
460 BM=LEN(VL$):FOR X=0 TO ND:G$(X)=D$(X):NEXT X:FF=0:MV=0:SV$=""
Solved:
470 D=1 AND FF:CLS:PRINT GM$(GM):PRINT "Level -";LV:PRINT:PRINT:
PRINT:PRINT "Best =";BM:ON D+1 GOSUB 850,860
480 YY=0:XX=MS-2:GOSUB 150:PRINT DP$(D);:XX=MS+1:GOSUB 150:PRINT
SV$;:XX=MS-1:GOSUB 150:PRINT MV$;
490 GOSUB 110:PRINT I$;:IF I$="" THEN FF=FF+1:GOTO 470
500 IF I$=QM$ THEN XX=MS:GOSUB 150:PRINT "Unsolved in";MV;"moves
":XX=MS+1:GOSUB 150:PRINT PR$;:D=2:GOTO 580
510 XX=MS:GOSUB 150:IF I$<"A" OR I$>"Z" THEN PRINT "Not a valid
move. Is CAPS lock on?":GOSUB 130:GOTO 470
520 IF INSTR(VL$,I$)=0 THEN PRINT I$;" not in puzzle";:GOSUB 130
:GOTO 470
530 LT$=I$:PRINT LT$;" = ?":GOSUB 110:PRINT CHR$(8);I$;:IF I$=""
R" THEN PRINT "eplace":GOSUB 880:GOTO 470
540 IF I$<"0" OR I$>"9" THEN PRINT "Invalid move":GOSUB 130:GO
TO 470
550 MV=MV+1:PRINT CHR$(8);"Inserting";I$;:ON GM GOSUB 930,970
560 FOR X=0 TO ND:IF G$(X)>A$(X) THEN 470 ELSE NEXT X
570 XX=MS:GOSUB 150:PRINT "Congratulations! -";MV;"moves":XX=MS
+1:GOSUB 150:PRINT PR$;:XX=5:GOSUB 150:PRINT "Score:";INT(BM
/MV*100);"%";
580 XX=MS-2:YY=0:GOSUB 150:PRINT DP$(D):ON D+1 GOSUB 850,860,870
590 GOSUB 110:IF I$="R" THEN 60 ELSE IF I$="A" THEN D=2 ELSE IF
I$="P" THEN D=1 ELSE IF I$="S" THEN D=0 ELSE 590
600 GOTO 580
610 FOR X=1 TO 26:S$(X)=CHR$(64+X):NEXT X:RD=26:FOR X=0 TO 9
620 GOSUB 120:IF S$(R)="" THEN 620 ELSE R$(X)=S$(R):S$(R)="" :R(X
)=0:NEXT X
630 FOR X=0 TO ND:D$(X)=A$(X):IF VAL(A$(X))=0 THEN 670
640 FOR Y=1 TO LEN(D$(X)) STEP 2
650 R=ASC(MID$(D$(X),Y)):IF R>47 AND R<58 THEN MID$(D$(X),Y)=R$(
R-48):R(R-48)=1
660 NEXT Y
670 NEXT X:FOR X=0 TO 9:IF R(X) THEN VL$=VL$+R$(X)
680 NEXT X:RETURN

```

Listing continued



Listing continued

```

690 NQ=0:CT=0:RD=3:FOR X=0 TO ND:D$(X)=A$(X):IF VAL(A$(X))=0 THE
N 730
700 FOR Y=1 TO LEN(D$(X)) STEP 2:R$=MID$(D$(X),Y):IF R$<"0" OR R
$>"9" THEN 720
710 CT=CT+1:GOSUB 120:IF R>1 THEN MID$(D$(X),Y)=QM$:NQ=NQ+1
720 NEXT Y
730 NEXT X:IF RIGHT$(D$(2),1)=QM$ THEN NQ=NQ-1:MID$(D$(2),LEN(D$
(2)))=RIGHT$(A$(2),1)
740 X$=D$(0):Y$=A$(0):CH=INT(LQ/2)+1:GOSUB 200:D$(0)=X$
750 X$=LEFT$(D$(2),LI):Y$=LEFT$(A$(2),LI):CH=INT(LI/2)+1:GOSUB 2
00:MID$(D$(2),1)=X$
760 X$=D$(ND):Y$=A$(ND):CH=INT(LEN(D$(ND))/2)+1:GOSUB 200:D$(ND)
=X$:OK=26-(4-LV)*5
770 IF NQ<OK THEN 820 ELSE CH=NQ:GO=NQ-OK:RD=CH
780 FOR X=3 TO ND-1:IF ASC(D$(X))=L THEN 810 ELSE Z=1
790 Y=INSTR(Z,D$(X),QM$):IF Y=0 THEN 810 ELSE Z=Y+1:GOSUB 120:IF
R<GO THEN MID$(D$(X),Y)=MID$(A$(X),Y,1):NQ=NQ-1
800 IF Z<=LEN(D$(X)) THEN 790
810 NEXT X:GOTO 770
820 SQ=65:FOR X=0 TO ND:IF ASC(D$(X))=L THEN 840 ELSE Z=1
830 Y=INSTR(Z,D$(X),QM$):IF Y THEN Z=Y+1:MID$(D$(X),Y)=CHR$(SQ):
VL$=VL$+CHR$(SQ):SQ=SQ+1:IF Z<=LEN(D$(X)) THEN 830
840 NEXT X:RETURN
850 FOR X=0 TO ND:GOSUB 140:PRINT G$(X);NEXT X:RETURN
860 FOR X=0 TO ND:GOSUB 140:PRINT D$(X);NEXT X:RETURN
870 FOR X=0 TO ND:GOSUB 140:PRINT A$(X);NEXT X:RETURN
880 GOSUB 1000:IF SC=0 THEN XX=MS:GOSUB 150:PRINT "Letter not so
lved";GOSUB 130:RETURN
890 SV$=LEFT$(SV$,SC-2)+RIGHT$(SV$,LEN(SV$)-SC)
900 FOR X=0 TO ND:IF VAL(A$(X))=0 THEN 920 ELSE Z=1
910 Y=INSTR(Z,D$(X),LT$):IF Y THEN Z=Y+1:MID$(G$(X),Y)=LT$:IF Z<
=LEN(D$(X)) THEN 910
920 NEXT X:RETURN
930 FOR X=0 TO ND:IF VAL(A$(X))=0 THEN 950 ELSE Z=1
940 Y=INSTR(Z,D$(X),LT$):IF Y THEN Z=Y+1:MID$(G$(X),Y)=I$:IF Z<=
LEN(D$(X)) THEN 940
950 NEXT X
960 GOSUB 1000:IF SC THEN RETURN ELSE SV$=SV$+LT$+" ":RETURN
970 FOR X=0 TO ND:IF VAL(A$(X))=0 THEN 990
980 Y=INSTR(D$(X),LT$):IF Y THEN MID$(G$(X),Y)=I$:X=ND
990 NEXT X:GOTO 960
1000 Z=8:SC=INSTR(Z,SV$,LT$):RETURN
1010 CLS:PRINT TAB(10-10)"Thank you for playing.":PRINT:PRINT BL
$:END

```

- \* 4091
- \* 4466
- \* 3578
- \* 625
- \* 4876
- \* 3095
- \* 4740
- \* 4726
- \* 3075
- \* 3141
- \* 6850
- \* 1674
- \* 1185
- \* 3432
- \* 6988
- \* 1165
- \* 3502
- \* 3500
- \* 3498
- \* 6133
- \* 2864
- \* 3021
- \* 5086
- \* 1164
- \* 3027
- \* 5005
- \* 629
- \* 3782
- \* 2474
- \* 3293
- \* 1195
- \* 2299
- \* 5065

End

**PRINTER DRIVERS  
For SUPERSCRIPIT**

Match YOUR Printer to a Great Word Processing System !!

Easily and automatically attach your printer to SuperSCRIPIT with an ALPS software printer driver program. No need to learn special printer codes. Call of write for info describing features supported on each printer (underline, bold, proportional, scripts, etc.).

Over 200 Different Printers Supported.

Custom Printer Driver for Each Printer.

Supports all possible printer features.

4 years experience. Customer Support !!!

\$49 or \$59 each, depending on printer.

**For Your MSDOS Computer  
Tandy 1000/1200/2000/3000 and PCs**

**RAMDISK**

(\$49)

Use spare memory to simulate one or more super-fast disks. Any size. Greatly speed up existing applications. Appears to programs as a disk, but gives instant access. Highly efficient, compact, and thoroughly tested. Includes program to install and change RAMDISK size, and RAMDISK I/O access report.

**FULLBACK**

(\$88)

A Perfect File Backup System !!!

Finally, an easy to use backup program that keeps exact images of your files on backup floppies, cartridges, or hard disk. Automatically backup one, several, or ALL subdirectories. Backup modified only, or ALL files. Keeps perfectly organized backups - backup structure and file format are identical to original. Supports backup by date, multiple backup copies, large files (up to 32MB). Far superior to DOS BACKUP, easier to use, and much more reliable. Absolutely a MUST for hard disk users.

**HIP-POCKET HELPERS**

(0)

The ALPS Hip-Pocket Helpers is a collection of powerful and easy to use utility programs. They include a slick Directory Tree, a sorted 5-across directory display, a sophisticated keyboard substitution aid (only 5K of RAM), utilities to search through ALL directories for file names or even strings within a file, and much, much more. 29 utilities in all. Call or write for info. Price and performance you can't find elsewhere.

ALL ALPS Software is Fully Guaranteed !!!  
Full Customer Support on our Hotline - 303-687-1442  
Call or Write for our complete catalog of products.

**ALPS**  
1502 County Road 25  
Woodland Park, Colorado 80866  
800-232-ALPS (Toll-Free)

**POP QUIZ**

**Make Great Connections!**

- Transfer files directly to/from disk
- Use XMODEM for error correction
- VT100 terminal emulation
- Autodial and logon with any autodial modem

**Omniterm**<sup>TM</sup>

Professional Communications Software

“...a powerful, polished program that's a real pleasure to use.”

NewsNet Newsletter, Aug. 1984

“...the greatest communications software I've ever used.”

PCM Magazine, Sept. 1985

“...beginners can get started with a minimum of effort.”

PC Magazine, Dec. 1984

“...could become the package of choice in many corporate multiple-machine PC environments.”

PC Week, Oct. 1984

“...a contender in both the smart terminal and host software categories.”

PC World, Sept. 1984

Now available in Radio Shack Stores! Ask for

Omniterm 2  
Cat.# 25-1160  
\$129.95

Omniterm Plus  
EOS Cat.# 900-123  
\$95.00

IBM PC/XT/AT,  
Tandy 1000/1200/2000/3000

TRS-80 Model 4/4P/4D

Omniterm is a product of Lindbergh Systems, Inc. P.O. Box 3604, Ann Arbor, MI (313) 971-9733

Circle 355 on Reader Service card.

**LARGE CAPACITY  
ACCOUNTING PROGRAMS** TRS80 3.4  
(3 MODE)  
4D or 4HD  
CAPACITY OF A HARD DISK  
ON DUAL FLOPPIES PC/MSDOS  
COMPATIBLES

**ACCOUNTS RECEIVABLE \$150.00**  
5000 ACCOUNTS -  
15000 TRANSACTIONS

- + BALANCE FORWARD
- + FINANCE CHARGES
- + SUB-ACCOUNTS
- + MAILING LABELS
- + UN-POST FEATURE
- + 4 STAR REVIEW IN 80-MICRO 9/85
- + AGED STATEMENTS
- + FAST DATA ENTRY
- + LAST PAYMENT
- + INVOICING
- + SCREEN CHECK

**GENERAL LEDGER \$150.00**  
400+ ACCOUNTS &  
5000+ TRANSACTIONS

UP TO 9 DEPARTMENTS DOUBLE ENTRY  
COMPARE MONTH, QTR, YR, BUDGET  
SUB-TOTAL WHERE YOU WANT

PROGRAMS WRITTEN IN BASIC,  
NOT COPY PROTECTED.  
UNLIMITED PHONE SUPPORT

**ACCOUNTS PAYABLE \$50.00**  
DERIVED FROM OUR A/R - WRITES CHECKS

DEMO FOR ABOVE \$20.00 EA + S&H  
WITH MANUAL, DISK & SAMPLE DATA

SAVE BUY AR & GL FOR \$200.00  
\$\$\$ BUY AR, AP, GL FOR \$225.00

**SUPER P/R PAYROLL - THE BEST \$200.00**

**H. D. P. (916) 533-5992**  
2366 LINCOLN 8 AM - 2 PM

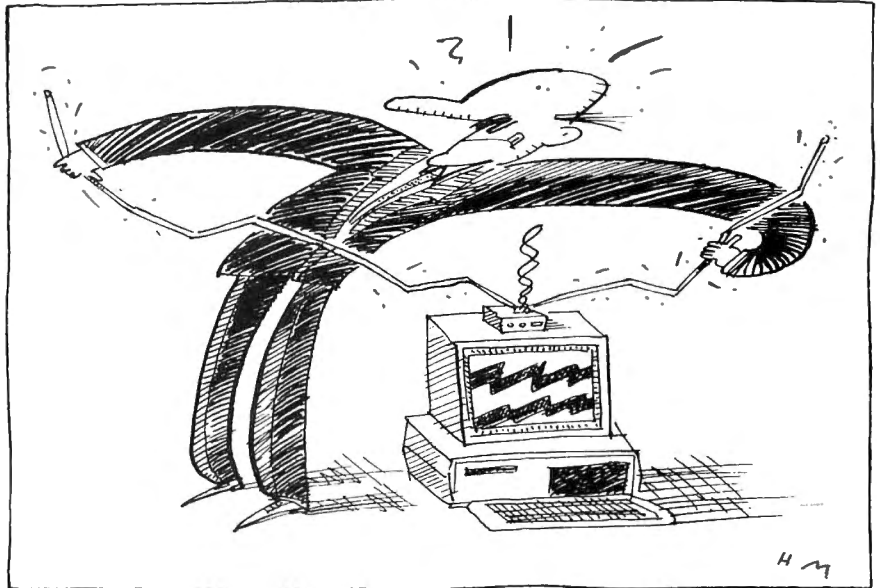
OROVILLE, CA. 95966 VISA-M/C

ADD \$3.00 S&H + \$3.00 IF COD

# Video Dreams

I've heard from several readers who say they are contemplating putting a video board in the Tandy 1000. You can put an IBM-type monochrome or Hercules board in the Tandy 1200 or 3000 to produce clear text for long stints of word processing. If you can afford them, an IBM Enhanced Graphics Adapter (EGA) board and monitor run Digital Research Inc.'s GEM and Microsoft's Windows with sharp text and color on Tandy's closer clones. But though you can find video boards short enough to fit the 1000, the computer's hardware quirks prevent them from working.

The display circuitry on the 1000's motherboard mimics both the IBM PC's Color Graphics Adapter (CGA), which provides a maximum resolution of 640 by 200 pixels (black and white), and the PCjr's added video capabilities (four colors with 640- by 200-pixel resolution). Other display modes provide more colors (up to 16) but with lower resolution. Text on an RGBI monitor, such as Tandy's CM-2 or CM-10, is adequately readable. A monochrome composite monitor hooked to the 1000 via the single-pin RCA jack on the back also provides reasonable text display. However, color composite monitors and TVs are



not worth consideration.

In addition to the CGA, other IBM clones can use an IBM-type monochrome monitor that provides clearer text display (7- by 9-pixel characters in a 9- by 14-pixel block with a screen resolu-

tion of 720 by 350 pixels) but no graphics. Even better is the Hercules Graphics Card, which produces sharp displays on IBM-type monochrome monitors in both graphics and text modes. Yes, you can have clear text and graphics, too.

## System Requirements

### Tandy 1000/1200/3000

Program Listing 1. Demonstration of the 1000's Basic screen-paging bug.

```
100 CLS
200 PRINT "This is screen 0, the default screen.
300 SCREEN 0,1,1,0 'should set active=1 and display=0
400 PRINT "This is screen 1, which should not be visible now."
500 FOR N=1 TO 10:PRINT "X":NEXT N 'something to watch, shouldn't show
600 SCREEN 0,1,0,0 'back to normal
```

End

Program Listing 2. Debug script to assemble PRINCODE.COM.

```
n princode.com
a
; assembly starts here
mov si,00 ;offset of command line in PSP
; loop here (103)
inc si ;point to next code
mov al,[si] ;get next code
cmp al,0D ;carriage return (end of line)?
jnz 10E ;if not, continue
mov ah,4C ;end program function
int 21
; continue here (10E)
cmp al,30 ;if less than ASCII 0
jl 103 ;go back
cmp al,39 ;if more than ASCII 9
jg 103 ;go back
call 11F ;convert ASCII to hex in dl
mov ah,5 ;DOS print char function
int 21 ;print code in dl
jmp 104 ;loop back (after inc si)
; call here - convert to binary subroutine(11F)
xor dx,dx ;zero dx for result
;loop (121)
```

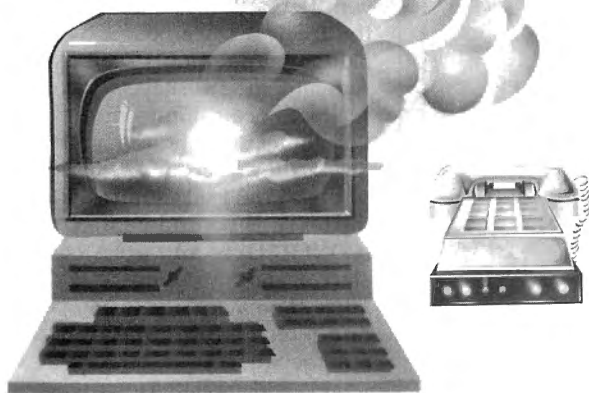
```
sub al,30 ;convert ASCII to hex
jl 13C ;if less than zero
cmp al,9 ;compare to 9
jg 13C ;if greater than 9 leave
cbw ;convert byte to word (ax)
push ax ;save one's place
mov ax,dx ;subtotal into ax
mov cx,0A ;multiplication by 10
mul cx ;ax = ax * cx
mov dx,ax ;product in dx
pop ax ;restore last digit
add dx,ax ;sum in dx
inc si ;point to next character
mov al,[si] ;get that character
jmp 121 ;subr. loop
;exit subroutine (13C)
ret
;next line must be blank to end assembly
```

```
rcx
200
w
q
```

End

# If you compute after dark...

## ...switch to the magic of GENie™ and stay on-line longer, for less!



Introducing GENie, the General Electric Network for Information Exchange. It's part of General Electric Information Services—the largest commercial teleprocessing network.

Now the power of GENie stands ready to bring a little magic into the life of PC owners just like you. And for potentially much less than other on-line information services.

With GENie, you pay no hidden charges or monthly minimum fees. You pay only for the actual time you're on-line and the \$18.00 registration fee. Nothing more.

### Compare & Save

|               | Services         |                 |              |                |       |                  | Pricing          |                 |                      |               |
|---------------|------------------|-----------------|--------------|----------------|-------|------------------|------------------|-----------------|----------------------|---------------|
|               | SIGs/User Groups | Electronic Mail | CB Simulator | Computing News | Games | 2400 baud access | Registration fee | Monthly minimum | Non-prime time rates |               |
|               |                  |                 |              |                |       |                  |                  |                 | 300 baud             | 1200 baud     |
| <b>GENie*</b> | X                | X               | X            | X              | X     | X                | <b>\$18.00</b>   | <b>none</b>     | <b>\$5.00</b>        | <b>\$5.00</b> |
| CompuServe    | X                | X               | X            | X              | X     | X                | \$39.95          | none            | \$6.25               | \$12.75       |
| The Source    | X                | X               | no           | X              | X     | X                | \$49.95          | \$10.00         | \$8.40               | \$10.80       |

\*Rates and Services shown in effect 12/85. Non-prime time rate applies Mon-Fri, 6pm-8am local time, all day Sat., Sun., and nat'l. holidays. Subject to service availability. Additional surcharge applies for 2400 baud service.

### Save up to 60%

Check out the chart above and compare it for yourself. You'll find GENie can deliver all of your favorite services for an incomparable price at incomparable savings!

### Put the power of GENie at your command

- Discuss the latest in computer products and accessories or download public domain software with GENie's **RoundTable™ Special Interest Groups**.
- Meet new people, share ideas with friends—old and new—with **LiveWire™**, GENie's CB simulator that has everybody talking!
- Get your message across and back again with **GE Mail™**, GENie's electronic mail service.
- Organize a local, regional or national get-together in one of GENie's 40 "conference rooms" with GENie's **Business Band Real-Time Conferencing**.
- Go one-on-one with classic computer games, match your wits against others with multi-player games, or download for future play in GENie's **Game Room**.
- Stay in touch with what's new on the microcomputer scene, courtesy of GENie's news service, **News and Commentary**.

GENie can take you to new highs in speed and keep you there. Because our non-prime time rate for 300 OR 1200 baud is only \$5.00 an hour. And that means you save 20 to 60%. Or if you prefer, 2400 baud service is now available.

With services and prices like these—talk, read, learn, or play to your heart's content. Because now you can keep your eyes on the screen, not on the clock.

With your personal computer, modem, communications software, and telephone, you already have everything you need to make GENie come to life. So why not Sign-Up today. Let GENie bring a little magic into your life!

### Sign Up From Your Keyboard Today 4 Easy Steps:

1. Have ready your VISA, MasterCard or checking account number to set up your personal GENie account.
2. Set your modem for half duplex (local echo)—300 or 1200 baud.
3. Dial 1-800-638-8369. When connected, enter HHH
4. At the U# = prompt, enter **XJM11946,GENIE** then RETURN.

No Modem Yet? Need more information or assistance? We can help! Call 1-800-638-9636, ext. 21.

Get on-line with GENie. And stay longer, for less.



General Electric Information Services Company, U.S.A.

Almost all text-based commercial software can display with a monochrome-monitor adapter, and many programs come with Hercules Graphics Card capabilities. If a program doesn't provide a Hercules driver, you're out of luck. Tandy has just introduced its own Hercules-clone card for the 1200 (Tandy catalog no. 25-3045) for \$249.95.

Despite the 1000's hardware peculiarities—notably, the switching of hardware-interrupt request lines 2 and 5 (hard drive and video vertical retrace)

and the PCjr-like mapping of the video address space at segment address B800 to upper RAM—some manufacturers (I won't say which) are thinking of producing a video adapter for it. In the coming year, you might see versions of EGA adapters for the 1000 (16 colors from a 64-color palette with 640- by 350-pixel resolution) or even more exotic boards providing 1,024- by 820-pixel resolution. Right now, only PCA Technology Inc. (2512 Pegasus Drive, Bakersfield, CA 93308) advertises a video board (a Hercules clone)

for the 1000. I'm anxious to test the board to see if it really works.

It's funny that the Tandy 2000 came out almost three years ago with a monitor capable of eight colors and a screen resolution of 640 by 400 pixels (from a palette of 16 colors). Like many of its features, the 2000's monitor is nonstandard. Tandy provides a video board that lets you use the 2000 monitor on the 1200 and 3000. You get standard CGA graphics and text, but the display is much sharper and more readable.

**Bits and Pieces**

Dave Rohde (Baltimore, MD) writes that the screen-dump driver that comes with DOS 2.11.01 (the latest version for the Tandy 2000) produces nice high-resolution output on his DMP 200 printer. Actually, the DOS has two drivers. One produces color dumps on the CGP 220 Color Inkjet Printer; the other produces black-and-white dumps on DMP series printers. You load the appropriate driver in the DOS bootup configuration file (CONFIG.SYS) and press control-1 to start or stop a dump. Tandy also provides the capability to call the screen dump as a subroutine from Basic or other languages.

More video-related information comes from Roger B. Gault (Austin, TX). Roger provided a small program to demonstrate that the 1000's GW-Basic screen paging still doesn't work right (see Program Listing 1). Although you can page with the new version of Basic (1.01), the active and display pages are tied together. You can't perform the handy trick of writing to one page (the active page) while displaying another.

I have another small machine-language program (see Program Listing 2) that can send control codes to printers (there wasn't room to include it in last month's column). Because Print Code takes the values that it sends out from the command line, the program works well for experimenting with your printer's control codes. Type the listing as an ASCII file named PRINCODE.SRC. If you don't have a text editor that creates ASCII files, use EDLIN, the MS-DOS text editor on your system disk. (DeskMate's Text module is not suitable.) Assemble the program with Debug using redirection of standard input:

```
DEBUG <PRINCODE.SRC
```

The left-angle bracket (the MS-DOS symbol for input redirection) causes Debug to take its input from the disk file PRINCODE.SRC rather than from the keyboard.

To use Print Code, type the program name, followed by the codes you want to send to your printer in decimal form sep-

Circle 289 on Reader Service card.

Available Now . . . **LIGHT PENS FOR TANDY 1000**

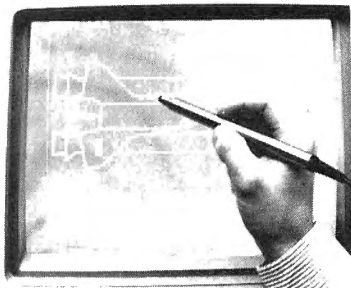
The WARP SPEED Light Pen is now available through RADIO SHACK Express Order. Order # 90-2069 for a Lightpen that plugs directly into the TANDY 1000, or order # 90-2074 for a Lightpen that plugs into the TANDY 1200 or 3000.

The WARP SPEED Light Pen is a professional quality, stainless steel pen that has been selected by the nation's leading Corporations to perform computer control operations, data input, high resolution graphics and many other applications. The Light Pen is now plug compatible with the TANDY computers and immediately available.



Warp Speed Light Pen

**FREE SOFTWARE FOR TANDY DESKMATE**



The WARP SPEED Light Pen comes with a software disk containing CONTROLLER, a fast file management program, a driver for Microsoft WINDOWS, and a driver for TANDY DESKMATE. In addition, software is available for Light Pen control on AUTOCAD, LOTUS 123, SYMPHONY, WORDSTAR, GEM and a Mouse to Light Pen convertor called PENMOUSE that will convert most major mouse driven software to Light Pen control.

- TANDY 1000 Light Pen . . . . . 90-2069 . . . . . \$199.99
- TANDY 1200/3000 Light Pen . . . . . 90-2074 . . . . . \$199.99

For more information call:

**1-800-874-4315**  
(In California 1-800-826-1563)



WARP SPEED COMPUTER PRODUCTS, INC.  
5555 South Inglewood Boulevard • Los Angeles, CA 90230 • (213) 822-0647

arated by spaces. Then press the enter key. For example, typing PRINCODE 27 64 returns an Epson printer to its default settings.

Writing a machine-language program that takes command-line parameters isn't so tough. When DOS loads a program into memory, it prefaces it with a 256-byte area called the program segment prefix (PSP). The PSP contains data, addresses, and file-buffer areas. One of the more useful fields in the PSP is the command line starting at byte 80 hexadecimal (hex) with the number of characters in the command line (zero to 127). Whatever you type after a program name, including the first space, is stored verbatim starting at 81 hex, ending with 0D hex (carriage return).

When DOS first loads a program, it points the DS and ES registers to the PSP. (In programs with the COM extension, all segment registers start at the PSP.) Your program should examine memory starting at DS:80 hex to see what, if anything, has been entered on the command line. Print Code starts at 81 hex and checks first for a carriage return, which will be there even if no parameters were entered. To convert ASCII decimal numbers to the binary format needed by the DOS functions, I lifted a conversion routine from the *Bluebook of Assembly Routines for the IBM PC and XT*, by Christopher L. Morgan (The Waite Group, \$19.95).

### Pocket References

Recent Microsoft assemblers no longer come with the *Programmer's Pocket Reference Guide* for the 8088/8087/80186/80188. You can get this handy booklet free, however, by writing to Intel, Literature Department, 3065 Bowers Ave., Santa Clara, CA 95051, 800-548-4725.

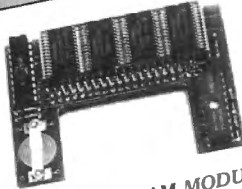
For \$3, you can get a combined IBM PC memory map and BIOS function chart from Micro Help Inc.. There's very little information on this quick-reference card that doesn't apply to the Tandy 1000. (Though the chart is a handy reference, it doesn't by any means replace the *Programmer's Reference Manual* for the Tandy 1000.) To order, contact Micro Help Inc., 2220 Carlyle Drive, Marietta, GA 30062, 404-973-9272. ■



Dave Rowell is an 80 Micro technical writer specializing in MS-DOS computing. Address correspondence to him to 80Micro, 80Pine St., Peterborough, NH 03458.

# Your Number One Choice

PG Design RAM modules have become the number one choice for Model 100, Tandy 200 users, not just because more people are using PG Design RAMs than any other brand—But because our name has become synonymous with PREMIUM QUALITY, RELIABILITY, and IMMEDIATE CUSTOMER SERVICE.



MODEL 100 64K RAM MODULE



MODEL 100 8K RAM MODULE



TANDY 200 24K RAM MODULE

When you purchase any PG Design RAM module, you're buying directly from the people who design, manufacture and service the product.

We develop the most advanced products of their kind by using the latest technology and the highest quality components available. Before we bring any product to market, it is carefully evaluated in the field by professionals. If it doesn't meet their standards, it doesn't meet ours. And when we finally bring our product to market, it's the finished product. It works as we say it will, and it will keep on working reliably. "Our reputation for excellence is riding on each and every RAM module we ship."

Whether it's an 8K or 64K RAM module to expand the memory of your Model 100 or a 24K RAM module for your Tandy 200, be assured you are buying the best when you buy PG Design RAM modules.

### Model 100

64K RAM module—\$375 ea. 32K RAM module—\$250 ea. 32K upgrade—\$150  
8K RAM modules—\$29.95 ea. Set of three \$84.00 (available for NEC 8201A)

### Tandy 200

24K RAM modules—\$139 ea. \$135 ea. two or more

We absolutely guarantee the quality and perfect performance of all PG Design RAM modules or your money back!

We supply easy to follow instructions with each of our products. And, we are eager to assist you on the phone if you should need help with the installation or operation of your RAM module.

To order, call us (313/727-2744), or write. All orders are shipped within five working days after receiving your order. We accept VISA, Master Card, personal checks or money orders.

PG Design Electronics, Inc. 66040 Gratiot, Richmond, Michigan 48062 (313) 727-2744  
Dealer inquiries invited. TANDY is a registered trademark of TANDY CORP.

# PG Design

# Random Selections

Many Basic programmers think random files are difficult to use. Compared to sequential files, they seem complex because of the amount of information required for reading and writing data. Also, all random-file records must match in size, which means you often have to trim data from large records to make them fit. It also means you can't save space with the occasional very small record. These restrictions are vexing enough to cause some programmers to ignore random files altogether.

Learning to use random-access files, however, is like learning to drive a car with a stick shift. You might buck and lurch in the beginning, but once you get the knack, you appreciate the control and versatility you've gained. In many programming situations, random files offer more flexibility and economy than sequential files. In this month's column, I'll try to dispel the confusion that surrounds random files and describe techniques that will allow you to exploit their space-handling capabilities most effectively.

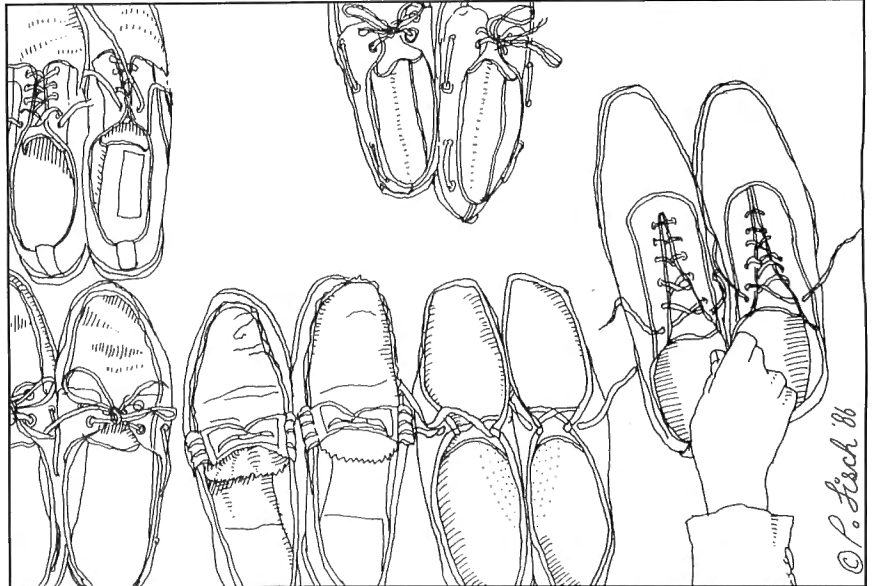
## Logical Order

If sequential files can be thought of as extremely long pieces of paper (see last month's column "Sequential Files: Data All in a Row," p. 88), then random files might be described as sets of uniformly sized index cards. Because index cards are all the same size, you can easily store them in a filebox and organize them in any order you wish. To find information, all you have to do is locate the appropriate card and pull it out.

Random files store and organize information in much the same way. Each record is like an index card in a set. You can decide for yourself which size record best suits your needs, just as you can decide whether to buy a set of 3- by 5-inch or 5- by 7-inch index cards. But once you determine a length, all records in the file must match it.

## System Requirements

All systems  
Basic



The syntax to open a random-access file is essentially the same under TRSDOS, CP/M, and MS-DOS. It is:

```
OPEN "R",N,"filespec",RL
```

where N is the file number, the filespec is the complete name of the file, and RL is the record length.

The most significant difference in the way the various operating systems and their versions of Basic handle random files has to do with their treatment of the record-length parameter (RL). In order to use the RL parameter in the Open statement on the Models I and III, you must answer 3V (three files, variable-length records) for the number of files you want to use when you enter Basic. Otherwise, you'll receive a "bad file mode" error. However, if you enter Basic by answering 3V, you can't specify the default length of 256; the only way to specify the default is to omit the record-length parameter completely.

On the Model 4, variable-length random files are automatic, but the record length still can't exceed 256, and again you can't specify 256 as a valid record-length parameter. Under CP/M and MS-DOS, variable-length records are also automatic, but the default length for records is 128, not 256. If you want to use longer records, you must specify that when you enter Basic. For both operat-

ing systems, the command is the same:

```
BASIC /S:XXXX
```

or:

```
MBASIC /S:XXXX
```

or:

```
BASICA /S:XXXX
```

where XXXX is the length you want to use. You can use any number you like—up to 32,768 under MS-DOS (32K)—provided you have enough memory. Nor are you prevented from using a record length of precisely 256. For some applications, I've used record lengths as large as 14K bytes.

Interpreted Microsoft Basic under MS-DOS contains an interesting bug. Basic will let you specify a maximum record length of 25,000 or more for each of three or more files. That's more memory than Basic has available on any MS-DOS system. If you try to use these file buffers, you'll overwrite either Basic or your program (or possibly both) in interesting and usually fatal ways.

TRSDOS imposes an annoying restriction: Once you've opened a file to a particular length, you can't later reopen it and change the length. CP/M and MS-DOS (contrary to what is stated in the Model 1000's GW-Basic manual) do allow this useful technique for speeding up file processing.

Circle 45 on Reader Service card.

# WORD PROCESSING SOFTWARE SALE

- Allwrite 35% off \$ 129.99
- Lescript 30% off \$ 83.99
- Lazy Writer 40% off \$ 74.99
- PowerScript 25% off \$ 29.99
- Electric Webster Speller 35% off w/Correcting Feature \$ 97.49

- "The Cadillac" of Spelling Checkers - 80 Micro, 3/82
- El. Web. Hyphenation 35% off \$ 32.49
- E.W. Grammar & Style 35% off \$ 32.49
- "A fantastic ... Grammar Checker" - 80 Micro, 4/85

For TRS-80 Models 1,3,4,4p,4d - Call for MS-DOS Prices.

**Order Now, Toll-Free:**  
**1-800-343-2432**  
**in Calif. 415-528-7002**

Visa, MasterCard, checks O.K. Add \$3 for C.O.D. Add \$5 for shipping & handling. Add sales tax in Calif. Prices good until 10/10/86 while supplies last!

**Software Sales Co.**  
**Box 5028, Walnut Creek, CA 94596**

Circle 371 on Reader Service card.

## 8 MHZ SUPER SPEED-UP

FASTEST SPEED-UP AVAILABLE

(models 1,3,4,4P,4D - all versions)

**BESTSELLER!!!!MAKE YOUR COMPUTER THE FASTEST IN TOWN!**

No Wait-States -

software and/or hardware controlled ..... **\$129.99**

### SUPER-RAM

(ramdisk version) 4.14

Ramdisk program to use 128k -1 megabyte memory, the most extended program on the market today. New-dos-80 or TRSDOS 6.X

**SPECIAL SUMMER PRICE ..... \$ 25.00**

upgrade for older versions \$4.00 + old diskette

### ONE MEGABYTE MEMORY BOARD

FOR MODEL 4 (non gate array. All versions) . . . . . **\$175.00**

FOR MODEL 4P (gate array & non gate array) . . . **\$175.00**

FOR MODEL 4 (gate array) . . . . . **\$225.00**

FOR MODEL 4D (gate array) . . . . . **\$225.00**

### 1/2 MEGABYTE MEMORY BOARD

FOR MODEL 4 (non gate array. All versions) . . . . . **\$125.00**

FOR MODEL 4P (gate array & non gate array) . . . **\$125.00**

FOR MODEL 4 (gate array) . . . . . **\$175.00**

FOR MODEL 4D (gate array) . . . . . **\$175.00**

Memoryboards without 256k(150ns) Chips. Price \$30 a set (8 chips). 1/2 MEG = 16 chips.

1 MEGABYTE = 32 chips

## SEATRONICS

P.O.B. 4607 - 6202 ZA MAASTRICHT - HOLLAND  
TELEX 56509 **MONEY BACK GUARANTEE**

Please specify exact system configuration for orders or requests

VISA - MASTER CARD - ACCES - EUROCARD -

TRAVELERS CHEQUES

Circle 107 on Reader Service card. **POP QUIZ**

# PRONTO

## Window Controller and Applications' Manager

Coming soon: a new name for PRONTO—to avoid confusion with Chemical Bank's Pronto electronic banking system.

**PRONTO** supplied applications can turn your **128K Model 4,4P TRS-80** into a sophisticated business or personal machine rivaling the best of them. That's because **PRONTO** comes with many useful and powerful menu-driven time savers and work organizers. **PRONTO** includes eleven applications, a complete HELP facility, a data file sort program, a 99-page user manual, and is easily installed just by typing, **PRONTO**.

While you operate other programs, you can request its services with a single keystroke. **PRONTO** saves you typing with its EXPORT and IMPORT functions which allow you to move data across windows between programs.

### PRONTO APPLICATIONS MODULES

- **ADDRESS:** Mailing Labels and Rolodex™ Cards
- **BRINGUP:** Tickler File and Appointments
- **CALENDAR:** Any Month From 1582 to 4902
- **CALCULATOR:** Four Function Floating Point
- **RPN CALC:** Seven Function in Bin, Oct, Dec, Hex
- **CARD:** 480 Character 3x5 Cards for Notes and Data
- **CHARSET:** Display All Video Characters
- **DIALER:** Telephone Number List and Auto Dialer
- **DOSAVE:** Save Entire Screen to Disk
- **TERM:** A Really Small Terminal Program
- **TYPER:** Line-Buffered Typing to Your Printer

### CHECK OUT THESE FEATURES!

- ✓ User Definable Activation Characters
- ✓ Run Memory Resident Modules With "F" Keys
- ✓ Direct Access to Disk Applications
- ✓ BOOT Directly to an Application with PRUN
- ✓ Interface to DOS Library Command
- ✓ Data IMPORT and EXPORT Across Applications
- ✓ Comprehensive On-Line HELP Facility
- ✓ DATAFILE SORT Utility is Provided
- ✓ Window Device Driver for BASIC is Supplied
- ✓ Comes With Full Technical Specifications
- ✓ 99 Page User Manual is Provided

### At Home

Use the CALENDAR and BRINGUP applications to keep track of medical and dental appointments for the family. Use it for birthdays and that all-important anniversary. Parties and other events can be scheduled too. The 3x5 CARD filer is great for jotting down notes which won't get lost. Enter recipes, or just use it to easily log your children's development. **PRONTO's** export function lets you transfer the notes directly to most word processors. The ADDRESS file can keep your mailing list handy. Easy editing keeps it current.

### At the office

The ADDRESS file data base can print both Rolodex cards and mailing labels for you. Forget about that 30-button dialer; use the DIALER telephone list to autodial hundred's of numbers through your modem. Dialing macros gives you very long number support. Use the BRINGUP tickler file and appointment book to schedule up to 12 times per day by time. Arrange your appointments. Log when payments are due. With **PRONTO's** 4 function CALCulator, you can use your computer for quick math and clear your desk of that old TI. **PRONTO** even turns your printer into a TYPEwriter!

only **\$59.95** VA residents add 4% Tax  
plus S&H (\$3 US, \$4 Canada, \$10 Foreign)



## MISOSYS, Inc.

PO Box 239  
Sterling, VA 22170-0239  
703-450-4181 MC, VISA, CHOICE  
800-MISOSYS 1P-5P EST Mon-Fri Orders Only!

"Visit our CompuServe SIG-GOPCS49"

**PRONTO** is also available at Radio Shack via Express Order (90-0353).

*Program Listing 1. Sample code for reading random-file data with a dummy sequential file.*

```

Q$=CHR$(34):R$=Q$+" "+Q$
OPEN"R",1,"FILESPEC":'use default length of 256 for record.
FIELD #1,255 AS A$,1 AS CR$
LSET CR$=","
OPEN"O",2,"DUMMY"
PRINT #2,Q$;B$;R$;C$;R$;D$;R$;E$;R$;F$;Q$
CLOSE 2
OPEN"i",2,"DUMMY"
LINE INPUT #2,G$
LSET A$=G$
PUT 1,4:'write record 4; this number will vary.
    
```

End

Model I TRSDOS doesn't handle variable-length records correctly, either. It won't allow you to read previous bytes in a sector until all 256 bytes have been written. Thus, if your record length is 128, you won't be able to read the last record in a file if it's odd numbered.

## Playing the Field

Once you've opened a random file and declared a record length, you'll want to put data into the file and be able to read it back out. The Put and Get statements store and retrieve random records. You usually have to use a Field statement to allocate fixed amounts of space for each field in the random record.

Most people are shocked the first time they try to use the Field statement. I know I was. It is the most confusing aspect of learning how to use random files correctly. It took me several days before I felt sure I understood what was going on.

The key is to think of the Field statement as a map. When you "field" a file buffer, you're simply providing the program with a map to each record. Suppose you write the following Field statement:

```
FIELD #1, 25 AS A$,13 AS B$,10 AS C$,5 AS D$,75 AS E$
```

This tells your program that each record is composed of five separate chunks; 25 characters are A\$, 13 are B\$, 10 are C\$, and so on.

The five character variables have a special status; they aren't in the same memory area as other variables. Therefore, you can't use them the same way. You can put things into them with LSET or RSET, and you can assign the value of those variables to ordinary character variables. For instance, you can say N\$ = A\$ (where A\$ is a field variable) and then manipulate N\$ as much as you like. But the instant you write something like A\$ = N\$, your special variable will be moved to the same memory area as all the ordinary variables and will no longer refer to the file buffer.

MS-DOS and CP/M have other options for reading and writing random-file data. One is to use the sequential file Print # command to put variably sized fields in-

to a random-file record and the Input # command to read them back out. This random-file technique allows you to write data into a fixed-length record, even if one field is abnormally long and another is short. You just have to be sure not to exceed the record length. If you want to retrieve specific records but retain some of the flexibility and simplicity of sequential files, this is an option to consider.

For this method of file access, you have to execute the command PUT #N,R after putting data into buffer #N with the Print # command. N specifies the file number; R specifies the record in which you want to put the information. CP/M and MS-DOS versions of Microsoft Basic also add a Write # command for use with either sequential or random files. It automatically puts quotation marks around, and a comma after, each data item.

Under TRSDOS, you can do the same thing using a dummy sequential file. You can't use a record length greater than 255 characters, and reading or writing the data is slower. Even so, you can derive many of the advantages of CP/M or MS-DOS without buying a new computer. Here's what to do.

First, use the Field statement to make each random-file record one long field. Then, open another file as a sequential output file. To perform a "pseudo-sequential" write to the random file, send the output to the sequential file first. (Execute all the Print commands just as you normally would.)

Next, close the sequential file and reopen it as a sequential input file. Use the Line Input command to retrieve the data and LSET it into the random-file buffer. Then use the Put statement to write the data to the random file.

You can reverse the process when reading the data. Program Listing 1 contains sample code with several interesting parts. The first is its use of the variables Q\$ and R\$. Rather than clutter up the program with quotation marks, CHR\$(34)s, and commas, I've compressed repetitive material into the two variables. R\$ is used between variables; Q\$ appears at the beginning and end. This isn't as nice as a Write command,

but it's an improvement over quotation marks and commas.

The second interesting part of the program is the sneaky little modification made in the Field statement. Note that the variable CR\$ is always a comma. This allows the random file to be read as a sequential file whenever necessary, even under TRSDOS.

Any Basic program that expects to read a sequential file can read this kind of random file. Even if the record length is less than 256, the trailing comma permits it to be used as a sequential file. For records with a length of 255 or less, you might prefer to change the variable CR\$ to CHR\$(13), a carriage return. In this case, however, you should omit the first LSET, define CR\$ as a carriage return, and use the syntax:

```
LSET A$ = G$ + CR$
```

for the second LSET. This way, a display of the records in the file (under TRSDOS) will look like an ordinary sequential-file listing and is thus less likely to cause confusion. The other method would result in one long and harder-to-read listing of the items, separated only by commas. Unused space in the 256-byte random record will be ignored as leading blanks when a program tries to read the data as a sequential file.

This type of file, if record length is less than 256, can't be read as a sequential file under TRSDOS. All TRSDOS sequential files must have a record length of 256. Other disk operating systems for the TRS-80 Model I/III/4 are more flexible about this sort of thing.

This method of using random files is helpful if you feel more comfortable with sequential files. The only problem is the wasted space caused by the commas, quotation marks, and additional spaces. Let's examine some methods for eliminating that waste.

## Space-Saving Tactics

Suppose you need to store a list of receipts in a business-application program. Many of you might think you would save space by storing the receipts in a sequential file. This is a fallacy. For many, if not most, business applications, random files store data more efficiently.

Storing the receipts in a sequential file would require eight characters: six for the digits, one for the decimal point, and one for the comma after each number. If you weren't careful when printing the numbers to the disk file, you'd probably store a leading space before each number, too.

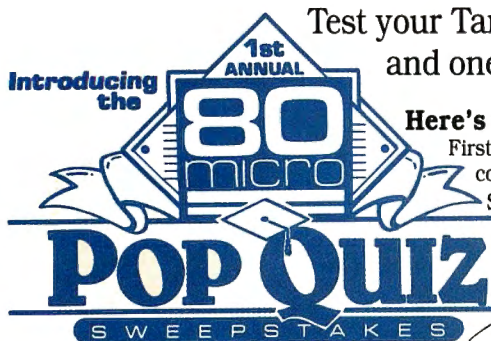
However, if you stored the same numbers as packed, single-precision numbers in a random file, each would take up only four spaces. Under extreme situations, a sequential file might use more





**World Premiere!  
80 Micro POP QUIZ  
SWEEPSTAKES!**

**WIN YOUR SHARE OF MORE THAN  
\$24,000  
WORTH OF FREE  
COMPUTERS. . . PERIPHERALS. . .  
SOFTWARE. . . AND ACCESSORIES!**



Test your Tandy computing IQ and one of these fabulous bundles may be yours!

Here's your chance to win thousands of dollars worth of exciting prizes. . . 80 Micro's First Annual **POP QUIZ SWEEPSTAKES**—specifically designed for advanced Tandy computer users like you!

So. . . if you were about to take out the garbage, or walk the dog, or something. . . ? Forget it! Sit down! Clear that desk! Put on your thinking cap. . . sharpen your pencil. . . and adjust those bifocals!

**Get ready to test your Tandy computing IQ!**



How much do you really know about today's hot products for your computer system? Give 80 Micro's **POP QUIZ SWEEPSTAKES** a try and find out!

**Here's how it works.**

One dark night we rounded up this magazine's best advertisers and told them to stand and deliver. The astonishing results? More computer goodies than our offices can hold. **Computers, hard drives, modems, memory boards, software** by the ton. . . jamming up our halls and offices. What do we do with the loot? We give it away. . . to the sharpest, the best, and the brightest. People like you.

To qualify for **your** share of our exciting prizes, cast your gaze onto that Entry Form page there on the right. Getting your own bundle of goodies is as easy as **1-2-3**.

**But remember. . .  
you can't win if  
you don't enter!**

We'll select POP QUIZ SWEEPSTAKES winners on October 15th, 1986. If you're the nervous type, you'd better tell your boss now that

you'll need the day off. Pace a little. . . drink coffee. . . stare at the phone. It'll be worth the stress when the Official 80 Micro Prizemaster calls and asks—

**"OK, big guy. . . where do we send all this stuff you just won?"**

**1**

Answer those questions! Hint. . . every answer is right here in the pages of this issue of 80 Micro. In fact, we even "clue" you in. . . just look for the words **POP QUIZ** in participating companies' ads. Participating companies are denoted in the Advertisers' Index next to the Reader Service Cards in this issue.

**2**

Have you double-checked your answers? Confident? Relaxed? Ready? Rip the entry form out of this issue (or use a reasonable facsimile), and send it off to: **80 Micro POP QUIZ SWEEPSTAKES 80 Pine St. Peterborough, NH 03458**

**3**

Here's the hard part. Stay cool while you wait. None of your friends know that you're about to become the best-equipped computer user in town. Get ready. . . ready for success. Ready for fame, acclaim, and thousands of dollars worth of **FREE** computer goodies!

**Enter the POP QUIZ SWEEPSTAKES and one of these exciting prize bundles can be yours:**

**Tandy Dandies**

. . . including a brand new Tandy Model 1000 HD, and more than \$2700.00 worth of software and peripherals!

**Only the Clonely**

. . . featuring a fully-equipped Aero-comp Clone PC-compatible computer, accompanied by more than \$2300.00 worth of goodies!

**Turbonanza**

. . . a \$3100.00 treasure trove of MS-DOS delights, bundled around a Turbo M PC-compatible from Software Support!

**4 Score**

. . . for seven years (or more) of nonstop Model 4 computing! More than \$3700.00 worth of software, peripherals and accessories!

**CoCoLoCo**

. . . almost \$400.00 worth of the best products available for your Color Computer!

**Port-O-Prize**

. . . a brand new Model 100 with the works. . . approximately \$1300.00 worth of peripherals and accessories!

**The Rest of the Best**

. . . hundreds of dollars worth of the best software on the market, bundled and shipped direct to you!

**OFFICIAL POINTY-HEADED RULES AND REGULATIONS**

If you don't read these carefully, we may have to send someone over to audit your taxes.

1. The way this works is: you answer the questions on our entry form (or any reasonable facsimile) and send it to us. If we select your entry at random from the correct entries received, you win one of the prizes described below. Your investment: 22 cents for a stamp. Our payoff: thousands of dollars worth of free computer goodies! Mail entries separately.
2. Answers to questions on the entry form can be found in the advertisements of participating companies—and all of those advertisements are in this issue of 80 Micro. Each participating company is denoted in our Advertiser's Index facing the Reader Service cards in this issue.
3. Remember. . . taxes, duties, local regulations, and that sort of thing are your responsibility. We at 80 Micro reserve the right to limit prizes. With advance apologies to our readers outside America, we do require that entrants reside in the United States.
4. The honor of winning carries additional responsibilities. Winners may be asked to lend their prestige to future promotional activities—including allowing us to use your name and likeness for publicity purposes.
5. No purchase of any product is required to enter.

The following restrictions also apply:

- This sweepstakes is void where prohibited.
- Employees (and their relatives) of participating advertisers and International Data Group, Inc. are prohibited from entering.
- Enter as many times as you like, using the facing Entry Page, a photoreproduction, or a legible, reasonable facsimile.
- Stated value of prize bundles is based on advertisers' retail prices.
- Substitution of products in prize bundles will be made only at the discretion of 80 Micro and participating advertisers, and is not subject to the winner's request.
- Specific details of this sweepstake's outcome can be obtained on written request to: Publisher, 80 Pine St., Peterborough, NH 03458.
- 80 Micro and International Data Group, Inc. cannot be responsible for participant's failure to honor applicable regulations.

| Advertiser/Donor                        | Approx. Value of Prize Package |
|---|--------------------------------|
| -1. Aerocomp . . . . .                  | \$ 1,520                       |
| -2. Alcor Systems . . . . .             | \$ 350                         |
| -3. Antitek Software Products . . . . . | \$ 1,650                       |
| -4. ATD . . . . .                       | \$ 250                         |
| -5. Automation Facility . . . . .       | \$ 300                         |
| -6. BCCOMPCO . . . . .                  | \$ 100                         |
| -7. The Computer Center . . . . .       | \$ 260                         |
| -8. Computer Plus . . . . .             | \$ 400                         |
| -9. Cornucopia . . . . .                | \$ 260                         |
| -10. Dec . . . . .                      | \$ 100                         |
| -11. Diskcount Data . . . . .           | \$ 2,100                       |
| -12. Dresselhaus . . . . .              | \$ 80                          |
| -13. Educational Micro . . . . .        | \$ 560                         |
| -14. Freedom Electronics . . . . .      | \$ 200                         |
| -15. H & E Computronics . . . . .       | \$ 550                         |
| -16. Hard Drive Specialist . . . . .    | \$ 330                         |
| -17. HJL . . . . .                      | \$ 90                          |
| -18. J & M . . . . .                    | \$ 1,000                       |
| -19. Jameco Electronics . . . . .       | \$ 90                          |
| -20. Laptopp . . . . .                  | \$ 150                         |
| -21. Lindbergh Systems . . . . .        | \$ 1,300                       |
| -22. Manzana . . . . .                  | \$ 410                         |
| -23. Marymac Industries . . . . .       | \$ 60                          |
| -24. Micro Labs . . . . .               | \$ 120                         |
| -25. Microlite . . . . .                | \$ 600                         |
| -26. Misosys, Inc. . . . .              | \$ 675                         |
| -27. Mix Software . . . . .             | \$ 400                         |
| -28. Montezuma Micro . . . . .          | \$ 470                         |
| -29. Nocona Electronics . . . . .       | \$ 100                         |
| -30. PBJ . . . . .                      | \$ 430                         |
| -31. PG Design . . . . .                | \$ 425                         |
| -32. Perry Computer . . . . .           | \$ 150                         |
| -33. PowerSoft . . . . .                | \$ 1,350                       |
| -34. Professor Jones . . . . .          | \$ 260                         |
| -35. Prosoft . . . . .                  | \$ 500                         |
| -36. Radio Shack . . . . .              | \$ 2,000                       |
| -37. Software Support . . . . .         | \$ 1,300                       |
| -38. SOTA . . . . .                     | \$ 500                         |
| -39. TCE . . . . .                      | \$ 360                         |
| -40. Total Access . . . . .             | \$ 1,100                       |
| -41. Traveling Software . . . . .       | \$ 400                         |
| -42. True Data Products . . . . .       | \$ 800                         |

# LOAD 80

*Utilities, tutorials, home and hobby applications from 80 Micro.*

If you've been shopping for software lately, you've discovered that new car buyers aren't the only ones who experience "sticker shock".

For the price of one commercial program, you can fill your gas tank at least three times. Or treat a friend to dinner. Or buy a year's worth of Sunday papers.

But with *Load 80* software, you can spend a lot less and *still* wind up with hundreds of dollars worth of outstanding TRS-80 programs every month.

On every *Load 80* cassette or disk (your choice!), you'll get more than a dozen "ready to run" programs listed in *80 Micro*. . . tutorials, utilities, games, word-processing, and much more.

Build a versatile software library, quickly and economically. Past issues have included programs such as:

## *NovaCalc*

. . . a full-featured Model I/III spreadsheet with all the capabilities offered on more expensive commercial products.

## *Easydata*

. . . a 200-record data base manager for fast information from your Model I/III/4.

## *Grade-A Graphics*

. . . a deluxe Model III graphics editor that's loaded with options!

And to enjoy your favorite program, all you have to do is "load 80" into your computer. It's that simple. No keyboarding, no debugging. You get complete loading instructions, but should you need assistance, the *Load 80* and *80 Micro* technical editors will be glad to answer your questions.

Don't let software sticker prices stop you from building a top-notch

library. Get a variety of winning programs, for a fraction of the cost, with *Load 80* cassettes or disks.

To order by the month or by the year, simply complete the coupon and drop it in the mail with payment.

For Faster Service, call

 **1-800-258-5473**

(In NH, please dial 1-924-9471.)

**Yes.** *I want to build an exciting and economical software library with Load 80.* Please send me:

- |   |  |
|---|--|
| <input type="checkbox"/> 1 year of Load 80 on disk for \$199.97   | <input type="checkbox"/> This month's Load 80 disk for \$21.47     |
| <input type="checkbox"/> 1 year of Load 80 on cassette for \$99.97  | <input type="checkbox"/> This month's Load 80 cassette for \$11.47 |
| <input type="checkbox"/> Check/MO <input type="checkbox"/> MC <input type="checkbox"/> VISA <input type="checkbox"/> AE |  |

Card # \_\_\_\_\_

Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

Prices include postage and handling. Foreign airmail, please add \$1.90 per item or \$25.00 per subscription. US funds drawn on US banks only.

**Load 80 • 80 Pine Street • Peterborough, NH 03458**

8609

# The Great Compression

This column marks the first in *80 Micro's* monthly effort to find the best public-domain programs available for Tandy/Radio Shack computers. I'll be searching hundreds of Tandy-related bulletin-board systems (BBSes) to find the programs I'll write about each month.

Many of them will be familiar favorites to some, but there will be new additions, too. For those readers who are not familiar with the vast storehouse of public-domain software, this column will tell you what you might find with a little exploration using a good terminal program and a modem.

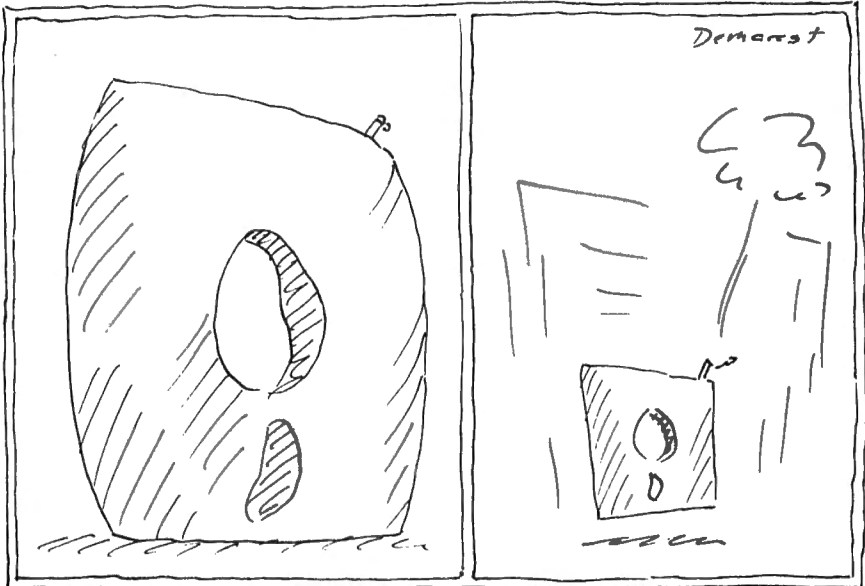
The focus this month is on a couple of file utilities designed to compress and archive files on disk to save space and directory slots. In addition, I'll introduce you to a terminal program put in the public domain by programmer Pete Cantele. All of this month's programs are for the Model 4 series computers, but that will not necessarily be the case every month.

## Squeezing and Unsqueezing

One of the most prolific TRS-80 programmers who makes his work available via the BBS network is David Huelsmann. Two of his Model III and 4 programs, SQ3/CMD and SQ4/CMD, take source and text files and compress them by as much as 40 percent before writing the new, smaller file to disk. Because of the savings in on-line time, the impact of the squeezing utility is especially evident when you upload or download files to or from BBSes. The advantage of squeezing files is also apparent when disk space is at a premium, such as on TRSDOS 6.x system disks.

The companion programs to Huelsmann's squeezers are the unsqueezers for the Model III and 4. USQ3/CMD and USQ4/CMD take the squeezed files and expand them to their original state so you can run them. If you were to list a squeezed file, all you would see on the screen is garbage similar to code listed from a CMD file.

Besides expanding squeezed files, the unsqueezing programs allow the user to view the first 20 lines (or the entire file) of a squeezed file, thus saving time that might be wasted unsqueezing an un-



ecessary file. It also lets the user look at a file he might not recognize by its file name.

The SQUSQ/DOC document file, which often accompanies the squeezing and unsqueezing programs, is as good as any you'll see in the public domain. The directions are concise and include examples for using the options in both programs. But, to the author's credit, instructions included in the SQ and USQ programs will get you using the programs even if the document file is not available.

## Become a Disk-File Librarian

A little organization goes a long way in making your computer a more productive tool. Helping you to organize similar or related disk files is LU4/CMD, another program submitted to the public domain by David Huelsmann. LU4 is a library utility that takes specified files and archives them on disk under one library name. When using the program, you indicate the name of the library you want to create and list all the programs or data files you want contained in that library. LU4 then condenses the files you listed under the library name you entered. Options include listing the file names of files in a library, extracting files from a library, printing the contents of a file within a library, deleting a file from a library, and reorganizing a library.

LU4 was uploaded to *80 Micro's* BBS without a documentation file, but I learned how to use it by experimenting with the options listed in the program's function menu.

In addition to being a TRS-80 public-domain guru, Huelsmann is accessible to people who use his programs. With questions or problems concerning his work, you can contact Huelsmann at the TBC BBS, 505-821-7379.

## Telecom Fever

If you are a fanatic about telecommunications and are always looking for the best and easiest-to-use terminal program, you might be interested in Pete Cantele's PTERM/CMD. Pete uploaded version 4.3 of his program to *80 Micro's* BBS in May and it looks like a real contender in a field of noteworthy telecommunications programs like FASTERM4 and XTERM4.

PTERM's features are similar to those used in commercial programs with auto-dial/auto-logon capability, variable-delay auto-redial, XMODEM (Christensen) file-transfer protocol, on-line DOS commands, received-character buffering, and others. The program also supports telecommunications or direct communications at rates up to 9,600 bits per second (bps).

## PUBLIC WORKS

For those of you familiar with STERM (another public-domain terminal program) or even MODEM80 (available from The Alternate Choice, Milwaukee, WI), the look of PTERM will seem similar. Many of the commands are the same because they provide the most logical way to present the program's functions. PTERM supports Hayes, Novation Smart-Cat, and Radio Shack internal 4P modems.

Accompanying PTERM/CMD on 80 Micro's board and others around the country is the documentation file, PTERM/DOC. Cantele has gone to great lengths to provide documentation that is easy to follow and understand. The file prints out to eight pages of single-spaced but very readable instructions on how to get the most out of the program. And in the event that you have questions or problems with the program, you can contact Cantele at 14727 Dante, Dolton, IL 60419.

### A Source For Public-Domain Software

If you have programming gems for Tandy computers and would like to submit them to the public domain, call 80 Micro's BBS 24 hours a day, 7 days a week at 603-924-6985. UART parameters for the BBS are 8-bit words, no parity, and 1 stop bit. It will respond to calls at 300 or 1,200 baud.

In addition to the programs mentioned here, the board offers many submitted by callers around the country. Readers have been sending disks in response to The Great 80 Micro Disk Swap at a rate of about three a day. Each disk contains at least three programs. (The disk swap, which ends September 1, was announced in the July issue, p. 37.) As soon as we catalog the responses, we'll put them on 80 Micro's BBS.

We've also been receiving letters from nonmodem users who want the address of the National Capitol Tandy Computer User's Group (NCTCUG). As mentioned in the July issue ("Going Public," p. 34), the NCTCUG is a great source of free, or nearly free, software for Tandy users. You can write to them at P.O. Box 2826, Fairfax, VA 22031. ■



*Bradford N. Dixon is an 80 Micro technical writer and telecommunications enthusiast. You can contact him via 80 Micro's bulletin-board system or at 80 Micro, 80 Pine St., Peterborough, NH 03458.*

## Put an Amber CRT in Your TRS-80

- Available in medium decay "European Phosphor" (the standard in Europe).
- Made with Lead/Strontium impregnated glass that stops X-ray emission.
- High-contrast double dark face glass that also cuts U.V. radiation.
- Face of tube is etched to stop glare.
- Easily installed. . . comes with pre-mounted hardware.
- Ideal for word processing and programming, yet fast enough for games and graphics.
- Warranted for one full year against manufacturing defects or tube failure.
- Comes with a 30-day money back guarantee.

### Langley-St. Clair

Instrumentation Systems, Inc.  
132 W. 24th St., New York, NY 10011

Call now to order your 'Soft-View™' CRT from Langley-St. Clair

**800 221-7070**

In New York call 212 989-6876

**SPECIAL SALE!**  
**AMBER CRT'S \$59.95**

## Tandy MS-DOS Computers and Accessories Sony-RCA-Pioneer Video and Audio Equipment Prices Reduced 30-50 % Off of Suggested Retail

Due to the limited space that we are allowed in this advertisement we are not able to adequately explain the "method of our Madness".

We can offer these drastic reductions because of the organizational structure that we have employed in the organization of our retail outlet.

Please send a post card with your name, address, and telephone number so that we may send you a letter of introduction and explanation as well as a catalog.

**Mail card to:**

**Discount Electronics Co.  
601 B. Nueces, Box 1526  
George West, Texas 78022**

In these days and times can you afford not to inquire about this opportunity to save additional money!

Circle 382 on Reader Service card.

Circle 357 on Reader Service card.

## MAC INKER™

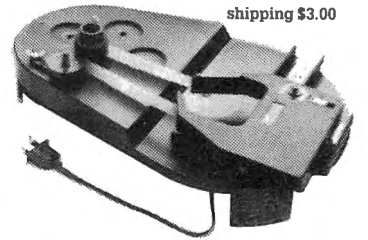
Re-ink Any Fabric Ribbon Automatically for less than 5 cents.

Dedicated Units Start at **\$54.95**

Universal Cartridge **\$68.50**  
MAC INKER

Universal Spool **\$66.95**  
MAC INKER

shipping \$3.00



Lubricated, Dot Matrix Ink \$3.00, bottle available in black/brown/red/green/yellow/purple/orange/gold and silver.

Over 50,000 MAC INKER(s) in the field.

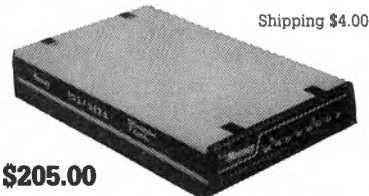
Over 7500 printers supported.

## MERCURY MODEM

Really 100% Hayes\* Compatible.

- 300/1200 baud.
- audio monitor/front panel lights.
- 18 months warranty.

Shipping \$4.00



**\$205.00**

\*Hayes is a trademark of Hayes Microproducts.

## DATA SWITCHES

All types, all lines switched, all metal, heavy duty switch, elegant design, best value for money.



2 Ports Parallel or Serial **\$ 7500**

4 Ports Parallel or Serial **\$15000**

2 Computers/2 Printers Parallel or Serial **\$15000**

We have cables too. Please inquire or specify at time of order.

Order Toll Free.

Call or write for free brochure.

**1-800-547-3303**

In Oregon 503-297-2321 (24 hours line)

# Computer Friends®

6415 SW Canyon Ct., #10, Portland, OR 97221,  
telex 4949559

Dealer inquiries welcome.

# Presto Change-O Video

The Model 4's video screen (in Model 4 mode) can display 896 different dot patterns that represent, to human eyes, various letters, numerals, punctuation marks, special foreign alphabet and graphics symbols, and block graphics patterns. Getting those patterns from a program to the screen involves a number of complex steps. This month, I'll try to shed some light on the process. Later in the article, I'll share a few programs that demonstrate the effects of the computer's video switches.

Generally, the Model 4's video capabilities work like this: A program sends one of 256 character codes to the video-driver software. The video software is responsible for recognizing which of the 896 displayable dot patterns, 32 control codes, and 64 space-compression codes the character represents. Once it understands the character code it has received, the video software places display codes ranging from zero to 255 into one or more of the 1,920 (80-column by 24-row) locations in a special memory area dedicated to the video display. The video hardware is then responsible for translating the value in each video-memory location into one of the 896 possible dot patterns and for putting that dot pattern on the screen in the appropriate place.

Common sense might tell you this is impossible. The video software only receives values from zero to 255, yet it must be able to handle 992 possible commands. The video hardware only reads values between zero and 255 from any location in screen memory, yet it must recognize the value as one of 896 dot patterns it can send to the video display tube.

This *would* be impossible if not for the the Model 4's six video switches. Three of the switches are hardware related (see Ta-



ble 1) and three are software related (see Table 2). The settings of the six determine the computer's current video state.

## Hardware Switches

The Model 4 video memory contains 1,920 cells, each corresponding to one of the character positions on the 80 by 24 screen. Each cell can hold 1 byte, and each byte can have a value from zero to 255. Therefore, there are 256 unique display codes that can be held in memory.

However, the video circuitry can display 96 normal letters, numerals, and punctuation marks (the ASCII character set), 64 block-graphics patterns, 160

special characters, and 128 inverse characters. Each of these 448 symbols is represented on the screen by two different patterns of dots. One pattern is used in the normal 80-column display; the second is used in the 40-column display.

The video-display hardware looks at the value stored in a video-memory location and at the settings of the three hardware switches; it then generates a dot pattern based on what it finds. The current settings of the hardware switches affect all display codes stored in video memory. Thus, when a hardware switch is changed, it affects the entire video display.

**LOAD  
80**

## System Requirements

**Model 4/4P/4D  
TRSDOS 6.x or LDOS  
Editor/assembler  
Basic**

|                      | When OFF   | When ON   |
|----------------------|--|---|
| Alternate characters | 192-255 are special characters.  | 192-255 are alternate characters.   |
| Inverse              | 128-191 are block characters and special or alternate characters.        | 128-255 are inverted forms of characters from zero to 127.                              |
| Screen size          | 80-column by 24-row screen. All positions in video memory are displayed. | 40-column by 24-row screen. Only even-numbered positions in video memory are displayed. |

All switches are off after boot or reset.

Character codes from zero to 127 are always displayed as numerals, letters, punctuation, and low-code special characters.

Table 1. Model 4 hardware video switches.

|  | When OFF   | When ON  |
|--|--|--|
| Space-compression/<br>special characters | Codes from 192 to 255 are translated to zero to 63 spaces.   | Codes from 192 to 255 are sent directly to the video memory.           |
| Control codes/<br>special characters     | Codes from zero to 31 are interpreted as control characters. | Codes from zero to 31 are sent directly to the video memory.           |
| High bit                                 | All codes are displayed according to other switches.         | Driver sets the high bit (character OR 128) of displayable characters. |

All switches are off after bootup or reset.  
Codes from 128 to 191 are always sent directly to the video display.

Table 2. Model 4 software video switches.

| Code  | Effect  |
|-------|---|
| zero  | Toggles control-code/special-character switch on or off. Switch is turned off every time any character is displayed.  |
| 1-7   | No effect.  |
| 8     | Backspace, cursor, and erase character.   |
| 9     | No effect.  |
| 10    | Moves cursor to beginning of next line and erases to end of that line.  |
| 11-12 | No effect.  |
| 13    | Same as 10.   |
| 14    | Turns on displayable cursor.  |
| 15    | Turns off displayable cursor.   |
| 16    | Turns on hardware inverse-video and software high-bit routine.  |
| 17    | Turns off software high-bit routine.  |
| 18-20 | No effect.  |
| 21    | Toggles space-compression/special-characters software switch.   |
| 22    | Toggles special-characters/alternate-characters hardware switch.  |
| 23    | Turns on wide-screen (40-column) hardware switch.   |
| 24    | Moves cursor one position backward.   |
| 25    | Moves cursor one position forward.  |
| 26    | Moves cursor one line down.   |
| 27    | Moves cursor one line up.   |
| 28    | Moves cursor to upper-left corner of screen, turns off hardware inverse-video switch, turns off hardware 40-column switch, turns off software high-bit routine. |
| 29    | Moves cursor to beginning of current line.  |
| 30    | Erases from cursor position to end of current line.   |
| 31    | Erases from cursor position to end of screen.   |

Table 3. Model 4 video-control codes.

The video hardware always handles display codes from zero to 127 in exactly the same fashion. The values from zero to 31 represent the low-code special characters (see Table 3). The values from 32 to 127 always represent the standard ASCII character set of letters, numerals, and punctuation.

When the first hardware switch is in the off position, the display codes from 128 to 191 represent block graphics and the codes from 192 to 255 represent the primary set of special characters. When the first hardware switch is on, the codes from 192 to 255 represent an alternate set of special characters.

The second hardware switch controls

inverse video and takes precedence over the first. In the off position, it allows the video hardware to read the first switch and display block graphics and special characters for codes 128-255. When the second switch is turned on, the block graphics and special characters are replaced by inverse (black on white) versions of display codes zero to 127.

The third hardware switch works independently of the first two. When it is off, the video appears in 80-column mode and every cell in the video memory is displayed as a dot pattern. When this switch is on, the video hardware shifts to 40-column mode. It then reads only the even-numbered locations in

video memory and makes every dot pattern it generates twice as wide as usual. In order for it to know whether to place display characters in every video-memory location or only in even-numbered ones, the video-display software must always be aware of how the third hardware switch is set.

### Software Switches

The settings of the three software-related switches determine how the video-display software handles each of the 256 possible values it can receive from a program. The first switch determines how the video driver interprets character codes 192-255. If the switch is off, the driver interprets them as space-compression codes. It subtracts 192 from each value and then sends the resulting number of space characters to the video memory. When the switch is on, the values from 192 to 255 are sent directly to video memory to be translated into the dot patterns for the special characters.

The second software switch affects handling of character codes from zero to 31. When the switch is turned off, the values are interpreted as control codes that ask the video software to set or reset the hardware and software switches, move the cursor around the screen, clear portions of the screen, or turn the cursor on and off. When the switch is turned on, the values from zero to 31 are sent directly to video memory, where they become the low-code special characters.

A possible problem exists with the second software switch. The other five video switches, both hardware and software, remain on until they're turned off. If the second software switch did the same, sending control codes to the video software after the switch was turned on would be impossible. Therefore, the second video switch is always turned off after the next character is received and processed.

The third software switch is related to the inverse-video hardware switch. When the switch is turned on, the video software sets the high bit of every value it places in video memory. Every value from zero to 127 is translated to its inverse representation and every value from 128 to 255 is left unchanged. In effect, when the switch is on, only inverse characters can be sent to video memory.

### Using the Codes

The video-driver software must be able to determine the current video state. Therefore, the settings of each switch are held in various memory bits scattered in low memory. The locations for the hardware bits are poorly documented; those for the software switches are not documented at all.

Determining the current video state is

**Both unknown switches are toggles, which means they act like a three-way light switch.**

virtually impossible for an application program. The situation might change with TRSDOS 6.3 (which is currently being designed), but that's no help to current programs. A possible solution is to turn off two of the hardware switches and two of the software switches by sending character code 28 to the video display twice in succession. However, a program still won't know the current state of the first hardware or software switch.

To make life even more difficult, both of the unknown switches are toggles, which means they act like a three-way light switch. When you send the codes affecting those two switches to the video driver, their current positions are toggled to the opposite, but your program still has no way of knowing what position they're in.

If a program could assume that all switches are in the off position when it takes control of the computer, which is how they're set after every bootup, it could keep track of the video state. Unfortunately, a program never knows if this assumption is correct.

Yet another problem is that at least two versions exist of the character-generator ROM chip that holds the dot patterns actually displayed on screen. An older ROM displays Japanese Katakana symbols as the alternate special characters. A newer version displays European alphabetic characters instead. The two ROMs also generate different dot patterns for the display codes from zero to 31. Therefore, any program that uses the low-code special characters or the alternate set of special characters will produce different displays on different Model 4's. I understand that Model 4's sold outside the United States and Canada contain a variety of character ROMs, making the incompatibility problem even more difficult.

**Now You See It**

The three programs I've written this month allow you to experiment with the effects of the Model 4's video switches. Program Listing 1 eavesdrops on the commands and character codes sent to the video driver. Every time a code is sent that will change the state of one of

Program Listing 1. Video-control tracking program.

```

00100 ;
00110 ; F-Key Video Control
00120 ;
00130 ; Install this program as a keyboard filter AFTER installing
00140 ; the VIDCTRL program as a video filter.
00150 ;
00160 ; SVC List
00170 @DSP EQU 02H
00180 @DSPLY EQU 0AH
00190 @VDCTL EQU 0FH
00200 @CHNIO EQU 14H
00210 @EXIT EQU 16H
00220 @GTMOD EQU 53H
00230 @HIGH EQU 64H
00240 @FLAGS EQU 65H
00250 ; F-Key definitions
00260 F1 EQU 81H
00270 F2 EQU 82H
00280 F3 EQU 83H
00290 SF1 EQU 91H
00300 SF2 EQU 92H
00310 SF3 EQU 93H
00320 ; Control character definitions
00330 INVON EQU 16
00340 DISINV EQU 17
00350 SPCCTL EQU 21
00360 ALTTGL EQU 22
00370 FRTYON EQU 23
00380 HOME EQU 28
00390 ; Bit masks for video status
00400 INVMSK EQU 1 ;Inverse display possible
00410 I_ENMSK EQU 2 ;High-bit routine on
00420 SPCMSK EQU 4 ;Special characters selected
00430 ALTMSK EQU 8 ;Alternate characters selected
00440 FTYMSK EQU 16 ;48-character mode
00450 ;
00460 ; Macro commands
00470 SVC MACRO #NUM
00480 LD A,#NUM
00490 RST 28H
00500 ENDM
00510 PRINT MACRO #ADDR
00520 LD HL,#ADDR
00530 SVC @DSPLY
00540 ENDM
00550 GETCRS MACRO ;Return cursor position in HL
00560 LD B,4
00570 SVC @VDCTL
00580 ENDM
00590 SETCRS MACRO ;Set cursor position in HL
00600 LD B,3
00610 SVC @VDCTL
00620 ENDM
00630 ;
00640 NRANGE MACRO #LOW,#HIGH,#NO ;Jump to #NO unless
00650 CP #LOW ; the A register is in
00660 JR C,#NO ; range of #LOW to #HIGH
00670 CP #HIGH+1 ; inclusive.
00680 JR NC,#NO
00690 ENDM
00700 ;
00710 SETKY MACRO #CHAR,#MASK,#ON_CHAR,#OFF_CHAR
00720 CP #CHAR ;Test character
00730 JR NZ,$?2 ;Go if no match
00740 LD A,(HL) ;Get VSTATE mask
00750 AND #MASK ;Is our character set?
00760 JR NZ,$?1 ;Yes -- go
00770 LD C,#ON_CHAR ;Else turn on function
00780 JR SENDOUT ;And display it
00790 $?1 LD C,#OFF_CHAR ;Or turn off video function
00800 JR SENDOUT ;And display it
00810 $?2 EQU $ ;Jump here when no match
00820 ENDM
00830 ;
00840 HOM_RET MACRO ;Sends 'home cursor' character
00850 PUSH AF ; then returns the cursor
00860 GETCRS ; to its previous position
00870 LD C,HOME ; Uses HL, DE, BC but saves
00880 SVC @DSP ; AF register
00890 SETCRS
00900 POP AF
00910 ENDM
00920 ;
00930 ORG 3000H
00940 ;
00950 ;
00960 ; Filter Header
00970 ;
00980 BEGIN JR START ;Jump over header
00990 OLDHI DW $-$ ;Word for old HIGH$
01000 DB MODDCB-BEGIN-5 ;Length of module name
01010 DB 'CTRL' ;Our "in-memory" name
01020 MODDCB DW $-$ ;Word for DCB address
01030 DW $-$ ;Reserved by TRSDOS
01040 ;
01050 ; Link to *KI chain
01060 ;
01070 CHAIN PUSH IX ;Save old value
01080 LD IX,(MODDCB) ;Get old DCB address
01090 REL_1 EQU $-2
01100 SVC @CHNIO ;Move down the chain
01110 POP IX ;Recover pointer
01120 RET
01130 ;
01140 ; Start of filter code
01150 ;
01160 START JR NC,CHAIN ;Go if not GET request
01170 CALL CHAIN ;Else go and return
01180 REL_2 EQU $-2
01190 RET NZ ;Return if no key
01200 PUSH AF ;Save flags
01210 NRANGE F1,F3,CHK_SF ;F1, F2, or F3?
01220 JR FOUND ;Yes -- go
01230 CHK_SF NRANGE SF1,SF3,NO_FKEY ;SF1, SF2, or SF3?
01240 JR FOUND ;Yes -- go

```

Listing continued



## Automatic DeskTop Publishing

with the  
**PowerText Formatter**

With an HP LaserJet or other laser printer and word processing software, all you need for DeskTop Publishing is the new **PowerText Formatter**.

For books, manuals, manuscripts, television scripts, screenplays, letters, memos, proposals, newsletters, contracts or ads like *this*, add the **PowerText Formatter** to your word processor for in-house printing. Write without concern for layout. Publish without type-setting. Everything is totally *automatic*.

**Automatic** Selection of up to 16 typestyles, Proportional justification, Text layout, Page

layout, Hyphenation, Multicolumn layout, Table of contents, Sorted bibliography, Two level index, Footnotes on same page, Newsletter formats, Boxed text, Outline numbering, and much more.

**Works with** all of the popular word processors and any ASCII Editor.

**For** PC/MS-DOS computers.

**Beaman Porter, Inc.**  
417 Halstead Avenue  
Harrison, NY 10528  
(914) 835-3156  
(800) 431-0007

Introductory price: **\$89.95** plus **\$5** shipping and handling

# More than Speed Reading!

# POWER READING

...with the Personal Learning System

Use your computer to double or triple your reading speed without skipping words. Power Reading trains you to read groups of words at a glance—in clusters. No skipping words as in Speed Reading. Learn to instantly switch from pleasure reading to study reading; always at increased speeds. Automatically adjusts to individual abilities. With Power Reading techniques, you read every word to increase comprehension and make reading easier and more enjoyable. Better than expensive classes.

**READ FASTER - UNDERSTAND MORE...  
...AND HAVE MORE FREE TIME!**

**\$69.50 Complete Package** • No computer knowledge needed  
• Unlimited back-ups • Single keystroke operation!  
• Grades 7 through Adult—tested!

**NO RISK!**

**MONEY BACK GUARANTEE**

DOUBLE YOUR READING SPEED IN  
15 DAYS OR YOUR MONEY BACK!

- At school: Easier test-taking; get better grades
- At work: Be more productive; save hours of time
- At home: Keep up with news, magazines, books

Model III/4       MS-DOS T/1000, 1200, 3000, IBM

Call Toll-Free (Day or night) **800-628-2828 Ext. 832**  
or send your order to:  
**LSR Learning Associates, Inc**  
Box 3264 Farmingdale, New York 11735

## Mail-Order Electronics • Worldwide • Since 1974

---

### TRS-80 MODEL 100

**PURPLE COMPUTING**

Easy to install module plugs right into the socket increasing memory in 8K increments. Three modules will increase your memory to its full capacity. Complete with module & documentation for installation.

**M1008K (TRS-80 Model 100 Expansion) ..\$24.95 ea. or 3/\$59.95**

### TANDY 200

Easy to install module plugs right into the socket increasing memory in 24K increments. Complete with module and documentation for installation.

**M200R (Tandy 200 Expansion)..... \$74.95 ea. or 2/\$129.95**

### TRS-80 MODEL I AND III

Model I: 16K equipped with Expansion Interface can be expanded to 48K with 2 Kits. Model III: Can be expanded from 16K to 48K using 2 Kits. Each Kit will expand computer by 16K increments (8 ea. 16K RAMs). Documentation incl.

**TRS-16K3 200ns (Model III)..... \$5.95**  
**TRS-16K4 250ns (Model I)..... \$5.49**

### TRS-80 MODEL 4, 4P

Easy to install Kits come complete with: TRS-64K-2 (8 each 4164N-20 (200ns) 64K Dynamic RAMs); TRS-64K-2PAL (8 each 4164's plus PAL chip) and documentation for conversion.

**TRS-64K-2 Expands Model 4 from 16K-64K or Model 4P from 64K-128K..... \$10.49**  
**TRS-64K-2PAL Expands Model 4 from 64K-128K..... \$29.95**

### TRS-80 COLOR AND COLOR II

Easy to install Kit comes complete with 8 each 4164N-20 (200ns) 64K Dynamic RAMs and documentation for conversion. Converts TRS-80 Color Computers with D, E, ET, F and NC circuit boards to 32K. Also converts TRS-80 Color Computer II to 64K. Flex DOS or OS-9 required to utilize full 64K RAM on all computers.

**TRS-64K-2..... \$10.49**  
**TRS-CoCo (New Models Only - Includes two 50464's (41464) and documentation for conversion)..... \$13.49**

### TANDY 1000 OWNERS!!

## NEW!

### ZUCKERBOARD Expansion Memory Half Card and Clock/Calendar for the Tandy 1000

The Zuckerboard Expansion Memory Board allows you to expand the memory of your Tandy 1000 (128K System) as much as 640K. 256K DRAM chips increase your computer's memory by either 256K or 512K, bringing your total system memory up to either 384K or 640K. The memory board also includes a DMA controller chip. Optional clock/calendar plugs directly onto the memory board. Manual included.

|                   |  |                 |
|-------------------|--|-----------------|
| <b>TAN-Clock</b>  | <b>Clock/Calendar Option (only).....</b> | <b>\$ 39.95</b> |
| <b>TAN-EM256K</b> | <b>Includes 256K RAM.....</b>            | <b>\$ 99.95</b> |
| <b>TAN-EM512K</b> | <b>Includes 512K RAM.....</b>            | <b>\$139.95</b> |

### Isobar Surge Suppressors

| Part No.         | Description            | Price          |
|------------------|------------------------|----------------|
| <b>IBAR-2-6</b>  | 2 Outlet, 6-foot Cord  | <b>\$44.95</b> |
| <b>IBAR-4-6</b>  | 4 Outlet, 6-foot Cord  | <b>\$59.95</b> |
| <b>IBAR-8-15</b> | 8 Outlet, 15-foot Cord | <b>\$74.95</b> |

**\$20.00 Minimum Order - U.S. Funds Only**  
California Residents Add 6% or 6½% Sales Tax  
Shipping - Add 5% plus \$1.50 Insurance  
Send S.A.S.E. for Quarterly Sales Flyer!

Spec Sheets - 30¢ each  
Send \$1.00 Postage for your  
**FREE 1986 JAMECO CATALOG**  
Prices Subject to Change

1355 SHOREWAY ROAD, BELMONT, CA 94002  
9/86 Phone Orders Welcome (415) 592-8097 Telex: 176043

©1986 Jameco Electronics

Listing continued

```

01250 NO_FKEY POP AF ;Else recover flags
01260 RET ;Not a function key -- leave
01270 ;-----
01280 ; Found a function key -- get to work
01290 ;-----
01300 FOUND PUSH BC ;Save working registers
01310 PUSH DE
01320 PUSH HL
01330 LD HL,VSTATE ;Point to work area of VCTRL
01340 SREL_1 EQU $-2
01350 ;-----
01360 ; Inverse key (F2)
01370 ;-----
01380 CP F2 ;Was it F2?
01390 JR NZ,CHK_F3 ;No -- go
01400 LD A,(HL) ;Get video mask
01410 AND INVMSK ;Inverse on?
01420 JR NZ,F2_1 ;Yes -- go
01430 LD C,INVON ;Else get character
01440 JR SENDOUT ;And display it
01450 REL_3 EQU $-2
01460 F2_1 LD A,(HL) ;Get mask again
01470 HOM_RET
01480 AND FTYMSK ;Was 40-character on?
01490 JR Z,NO_RET ;No -- leave
01500 LD C,FRTYON ;Else turn it back on
01510 JR SENDOUT ;And leave
01520 ;-----
01530 ; 40 - column key (F3)
01540 ;-----
01550 CHK_F3 CP F3 ;Was it F3 key?
01560 JR NZ,CHK_F1 ;No -- go
01570 LD A,(HL) ;Else get mask byte
01580 AND FTYMSK ;Is 40-col set?
01590 JR NZ,F3_1 ;Yes -- go
01600 LD C,FRTYON ;Else get 40-col character
01610 JR SENDOUT ;And leave
01620 F3_1 LD A,(HL) ;Get mask again
01630 HOM_RET
01640 LD B,A ;And save again
01650 AND INVMSK ;Was inverse on?
01660 JR Z,NO_RET ;No inverse -- go
01670 LD C,INVON ;Else turn it on
01680 SVC @DSP ;Display it.
01690 LD A,B ;Recover mask
01700 AND L_ENMSK ;Inverse disabled?
01710 JR NZ,NO_RET ;No -- go
01720 LD C,DISINV ;Get disable character
01730 JR SENDOUT ;And leave
01740 ;-----
01750 ; Special/Alternate characters (F1)
01760 ;-----
01770 CHK_F1 SETKY F1,ALTMASK,ALTTGL,ALTTGL
01780 ;-----
01790 ; Space compress/special character (Shift F1)
01800 ;-----
01810 SETKY SF1,SPCMSK,SPCTGL,SPCTGL
01820 ;-----
01830 ; Inverse Disable (Shift F2)
01840 ;-----
01850 SETKY SF2,I_ENMSK,INVON,DISINV
01860 ;-----
01870 ; Low-Ascii Routine (Shift F3)
01880 ;-----
01890 INC HL ;HL==> LOWCTRL in VCTRL filter
01900 LD A,(HL) ;Get current flag
01910 CPL ;Invert it
01920 LD (HL),A ;And put it back
01930 DEC HL ;HL==> VSTATE in VCTRL
01940 CALL STATUS ;Show display
01950 SREL_2 EQU $-2
01960 JR NO_RET ;And then go
01970 SENDOUT SVC @DSP ;Display character in C
01980 NO_RET POP HL ;Recover registers
01990 POP DE
02000 POP BC
02010 POP AF
02020 OR 1 ;Set NZ flag
02030 LD A,0 ;Send back no character
02040 RET ;Back to calling routine
02050 FLTEND EQU $-1
02060 FLTLEN EQU $-BEGIN
02070 VSTATE EQU $
02080 STATUS EQU $ ;This will keep the assembler happy
02090 ; So will this
02100 ;-----
02110 ; The rest of the program is initialization code that
02120 ; is thrown away when the program is relocated to protected
02130 ; high memory.
02140 ;-----
02140 INIT EQU $
02150 PUSH DE ;Save for later
02160 LD DE,VMODNAM ;Module name for VCTRL filter
02170 SVC @GTMOD ;Is it in memory?
02180 JR Z,SET_PTR ;Yes -- go
02190 LD HL,NOVCTRL ;Else point HL to error msg
02200 JR ERR_OUT ;And leave
02210 SET_PTR LD DE,@EH ;Offset to VSTATE
02220 ADD HL,DE ;HL==> VSTATE in VCTRL
02230 LD (SREL_1),HL ;Save in our program
02240 LD DE,95H-0EH ;Offset to STATUS routine
02250 ADD HL,DE ;HL==> STATUS in VCTRL
02260 LD (SREL_2),HL ;Save in this program
02270 POP DE ;Recover original value
02280 *GET INSTALL
02290 RELTAB DW REL_1,REL_2,REL_3
02300 DW 0
02310 CR EQU 13
02320 LF EQU 10
02330 VMODNAM DB 'VCTRL',0
02340 MODNAME DB 'FCTRL',0
02350 NOVCTRL DB 'You must install the VCTRL program before installing',LF
02360 DB 'this program. Installation aborted.',LF,CR
02370 SIGNON DB 'Model 4 Function-Key/Video Control Program',LF,CR
02380 SUCCESS DB 'Installation successfully completed.',LF
02390 DB 'Use the FILTER command to connect to *KI',LF,CR
02400 END INIT

```

End

the video switches, Listing 1 makes a corresponding change in its own data area. Every time a control code is sent to the video driver, Listing 1 displays the current status of the switches in the screen's upper-right corner. An underline symbol means that a switch is turned off; any other character means that a switch is turned on.

The top row of the display shows the state of the hardware switches. "A" indicates that the alternate set of special characters has been selected, "I" means that inverse video has been enabled, and "4" means that the screen is in 40-column mode.

The second row shows the positions of the software switches. "C" indicates that the video driver will display special characters instead of space-compression codes, and "H" indicates that the high-bit routine is on. "L" means that a special low-code routine has been turned on inside Listing 1, forcing the video driver to display all character codes between zero and 31 instead of interpreting them as control codes.

To use Listing 1, assemble it as VCTRL/FLT and then install it by typing (at TRS-DOS Ready):

```

SET *VI VCTRL
FILTER *DO *VI

```

Program Listing 2 lets you change the video switches directly by using the function keys. The unshifted keys relate to the hardware switches; the shifted keys affect the software switches. Shift-F3 turns the special low-code routine in Listing 1 on and off.

The second program depends on the first to read the current video state. Therefore, you must install the first program before installing the second. To run the second program, assemble it as FCTRL/FLT and then type:

```

SET *FI FCTRL
FILTER *KI *FI

```

When you've installed both programs, go to Basic, press shift-F1 to turn on special characters, and then run Program Listing 3. By pressing combinations of the unshifted function keys, you'll be able to see all 896 possible display characters on screen. At the same time, the display in the top corner of the screen will show you which hardware switches are turned on.

Since the hardware switches affect the entire screen, and since only 256 possible values can be placed in any video-memory cell, the screen can't have more than 256 different characters on it at any one time. Some characters can never appear together at all. For example, when inverse video is enabled, the only special characters that can appear

on the screen are the low-code characters. The other special characters, alternate special characters, and block graphics can never appear on the same screen with inverse characters.

With both programs installed, the shifted function keys affect the software switches. Since the switches change the way new characters are interpreted, the effects will be apparent only when new characters are printed on the screen. If you press shift-F3 and then press the enter key, for example, you'll see special characters, but the cursor won't advance to the next line. The reason is that the control codes that Basic is sending to the video display are being changed into character codes.

## Writing Filter Programs

Listings 1 and 2 are both filter programs, a topic that several readers have asked me to explain in more detail. To understand how a filter works, you first need to know how TRSDOS communicates with character-oriented devices, such as the video screen, printer, keyboard, and open files, when they are in character mode.

Whenever a character is being sent to or requested from a character device, TRSDOS sets the carry and zero flags in the Z80 and then calls the appropriate device driver. The device software is responsible for examining the carry and zero flags to determine whether it's being asked for a character (a Get request), being sent a character (a Put request), or being sent some direct commands (a CTL request). The filter fulfills the request it has received and then issues a RET instruction to return to the program that called it.

When you install a filter, it receives the request instead of the original driver software. However, it can communicate with the original software by using the @CHNIO supervisory call (SVC). The Chain sections of Listings 1 and 2 are identical and demonstrate the appropriate method for communicating with the original device software (or another filter installed between the driver and your program). The original driver will return to your filter, and your filter is responsible for returning to the original program. Often, the flag registers are used to return status information to TRSDOS or the original program as well.

This system is extremely flexible and powerful. Some filters are written to be installed on both input and output devices. For example, you can install the Click/FLT program that is supplied with TRSDOS as a filter on the \*DO (video-output) device. You'll then hear a click every time a character is put on the screen.

To make this work, every filter (and

*Program Listing 2. Program to control video with the function keys.*

```

L00100 ;-----
00110 ;           F-Key Video Control
00120 ;
00130 ;           Install this program as a keyboard filter AFTER installing
00140 ;           the VIDCTRL program as a video filter.
00150 ;-----
00160 ;           SVC List
00170 @DSP EQU 02H
00180 @DSPLY EQU 0AH
00190 @VDCTL EQU 0FH
00200 @CHNIO EQU 14H
00210 @EXIT EQU 16H
00220 @GTMOD EQU 53H
00230 @HIGH EQU 64H
00240 @FLAGS EQU 65H
00250 ;
00260 ;           F-Key definitions
00270 F1 EQU 81H
00280 F2 EQU 82H
00290 F3 EQU 83H
00300 SF1 EQU 91H
00310 SF2 EQU 92H
00320 SF3 EQU 93H
00330 ;
00340 ;           Control character definitions
00350 INVON EQU 16
00360 DISINV EQU 17
00370 SPCTGL EQU 21
00380 ALTTGL EQU 22
00390 FRTYON EQU 23
00400 HOME EQU 28
00410 ;
00420 ;           Bit masks for video status
00430 INVMSK EQU 1 ;Inverse display possible
00440 I_ENMSK EQU 2 ;High-bit routine on
00450 SPCMSK EQU 4 ;Special characters selected
00460 ALTMSK EQU 8 ;Alternate characters selected
00470 FTYMSK EQU 16 ;40-character mode
00480 ;
00490 ;-----
00500 ;           Macro commands
00510 SVC MACRO #NUM
00520 LD A,#NUM
00530 RST 28H
00540 ENDM
00550 ;
00560 PRINT MACRO #ADDR
00570 LD HL,#ADDR
00580 SVC @DSPLY
00590 ENDM
00600 ;
00610 GETCRS MACRO ;Return cursor position in HL
00620 LD B,4
00630 SVC @VDCTL
00640 ENDM
00650 ;
00660 SETCRS MACRO ;Set cursor position in HL
00670 LD B,3
00680 SVC @VDCTL
00690 ENDM
00700 ;
00710 NRANGE MACRO #LOW,#HIGH,#NO ;Jump to #NO unless
00720 CP #LOW ; the A register is in
00730 JR C,#NO ; range of #LOW to #HIGH
00740 CP #HIGH+1 ; inclusive.
00750 JR NC,#NO
00760 ENDM
00770 ;
00780 SETKY MACRO #CHAR,#MASK,#ON_CHAR,#OFF_CHAR
00790 CP #CHAR ;Test character
00800 JR NZ,$?2 ;Go if no match
00810 LD A,(HL) ;Get VSTATE mask
00820 AND #MASK ;Is our character set?
00830 JR NZ,$?1 ;Yes -- go
00840 LD C,#ON_CHAR ;Else turn on function
00850 JR SENDOUT ;And display it
00860 $$?1 LD C,#OFF_CHAR ;Or turn off video function
00870 JR SENDOUT ;And display it
00880 $$?2 EQU $ ;Jump here when no match
00890 ENDM
00900 ;
00910 HOM_RET MACRO ;Sends 'home cursor' character
00920 PUSH AF ; then returns the cursor
00930 GETCRS ; to its previous position
00940 LD C,HOME ; Uses HL, DE, BC but saves
00950 SVC @DSP ; AF register
00960 SETCRS
00970 POP AF
00980 ENDM
00990 ;
01000 ;-----
01010 ;
01020 ;           ORG 3000H
01030 ;
01040 ;-----
01050 ;           Filter Header

```

Listing 2 continued

every program installed in protected high or low memory), must begin with a standard header. The first 2 bytes of the header must be a relative jump to the beginning of the code. The next 2 bytes contain the address of the previous top of unprotected memory. This is followed by a byte that contains the length of the module's in-memory name, and then by the name itself. The name is followed by 4 bytes or two words of zeros.

The first word of zeros holds the address of a pointer to the next filter or driver in the chain. When you use the Filter command in TRSDOS, it places the appropriate address in that area. The second word of zeros is currently unused by TRSDOS, but it is reserved for future expansion.

In Listings 1 and 2, those two words are shown as \$-\$ instead of zero. With most Z80 assemblers, the dollar sign stands for the current contents of the program counter. The symbol \$-\$ therefore means the current PC contents minus the current PC contents. Obviously, this will always be zero.

The reason for using \$-\$ instead of zero is simple but subtle. Many programmers use \$-\$ to mean "I don't care what value goes here. It will be set when the program is running." They use zero to mean "I specifically want a value of zero placed here." Although the meanings are the same to the assembler, they are different to a human reading the program.

The section of code that installs a filter program into protected high memory is pretty standard. I've used essentially the same instructions for every filter I've written for the past two years. The screen messages are a little different, and the entries in the relocation table might vary, but the actual working code rarely changes.

Therefore, I've put the common code in a third ASM file (see Program Listing 4) and let my assembler add it to every filter program for me. The \*Get instructions in both Listings 1 and 2 refer to the code in Listing 4; you must type in Listing 4 and save it on your disk as Install/ASM before assembling either Listing 1 or 2. If your assembler doesn't have a \*Get or \*Include command, you'll have to add Listing 4 to both Listings 1 and 2 before assembling them.

I've used several macro instructions in both programs to make them shorter and easier to understand. If your assembler doesn't support macros or nested macros, my column in the January 1986 issue of *80 Micro* tells how to expand the instructions by hand. (See *The Next Step*, January 1986, p. 108.) I've found that the MISOSYS assemblers (EDAS, PRO-Create, and PRO-MRAS) provide the best support for macro instructions, which is why I use those assemblers ex-

Listing 2 continued

```

01060 ;-----
01070 BEGIN JR START ;Jump over header
01080 OLDH1 DW $-$ ;Word for old HIGH$
01090 DB MODDCB-BEGIN-5 ;Length of module name
01100 DB 'FCTRL' ;Our "in-memory" name
01110 MODDCB DW $-$ ;Word for DCB address
01120 DW $-$ ;Reserved by TRSDOS
01130 ;
01140 ;-----
01150 ; Link to *KI chain
01160 ;-----
01170 CHAIN PUSH IX ;Save old value
01180 LD IX,(MODDCB) ;Get old DCB address
01190 REL_1 EQU $-2
01200 SVC @CHNIO ;Move down the chain
01210 POP IX ;Recover pointer
01220 RET
01230 ;
01240 ;-----
01250 ; Start of filter code
01260 ;-----
01270 START JR NC,CHAIN ;Go if not GET request
01280 CALL CHAIN ;Else go and return
01290 REL_2 EQU $-2
01300 RET NZ ;Return if no key
01310 PUSH AF ;Save flags
01320 NRANGE F1,F3,CHK_SF ;F1, F2, or F3?
01330 JR FOUND ;Yes -- go
01340 CHK_SF NRANGE SF1,SF3,NO_FKEY ;SF1, SF2, or SF3?
01350 JR FOUND ;Yes -- go
01360 NO_FKEY POP AF ;Else recover flags
01370 RET ;Not a function key -- leave
01380 ;-----
01390 ; Found a function key -- get to work
01400 ;-----
01410 FOUND PUSH BC ;Save working registers
01420 PUSH DE
01430 PUSH HL
01440 LD HL,VSTATE ;Point to work area of VCTRL
01450 SREL_1 EQU $-2
01460 ;-----
01470 ; Inverse key (F2)
01480 ;-----
01490 CP F2 ;Was it F2?
01500 JR NZ,CHK_F3 ;No -- go
01510 LD A,(HL) ;Get video mask
01520 AND INVMSK ;Inverse on?
01530 JR NZ,F2_1 ;Yes -- go
01540 LD C,INVON ;Else get character
01550 JP SENDOUT ;And display it
01560 REL_3 EQU $-2
01570 F2_1 LD A,(HL) ;Get mask again
01580 HOM_RET
01590 AND FTYMSK ;Was 40-character on?
01600 JR Z,NO_RET ;No -- leave
01610 LD C,FRTYON ;Else turn it back on
01620 JR SENDOUT ;And leave
01630 ;-----
01640 ; 40 - column key (F3)
01650 ;-----
01660 CHK_F3 CP F3 ;Was it F3 key?
01670 JR NZ,CHK_F1 ;No -- go
01680 ;
01690 LD A,(HL) ;Else get mask byte
01700 AND FTYMSK ;Is 40-col set?
01710 JR NZ,F3_1 ;Yes -- go
01720 LD C,FRTYON ;Else get 40-col character
01730 JR SENDOUT ;And leave
01740 F3_1 LD A,(HL) ;Get mask again
01750 HOM_RET
01760 LD B,A ;And save again
01770 AND INVMSK ;Was inverse on?
01780 JR Z,NO_RET ;No inverse -- go
01790 LD C,INVON ;Else turn it on
01800 SVC @DSP ;Display it.
01810 LD A,B ;Recover mask
01820 AND I_ENMSK ;Inverse disabled?
01830 JR NZ,NO_RET ;No -- go
01840 LD C,DISINV ;Get disable character
01850 JR SENDOUT ;And leave
01860 ;-----
01870 ; Special/Alternate characters (F1)
01880 ;-----
01890 CHK_F1 SETKY F1,ALTMASK,ALTTGL,ALTTGL
01900 ;-----
01910 ; Space compress/special character (Shift F1)
01920 ;-----
01930 SETKY SF1,SPCMSK,SPCTGL,SPCTGL
01940 ;-----
01950 ; Inverse Disable (Shift F2)
01960 ;-----
01970 SETKY SF2,I_ENMSK,INVON,DISINV
01980 ;-----
01990 ; Low-Ascii Routine (Shift F3)
02000 ;-----

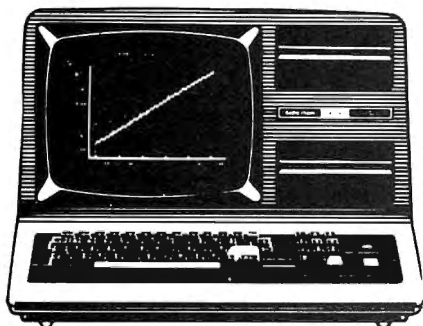
```

Listing 2 continued

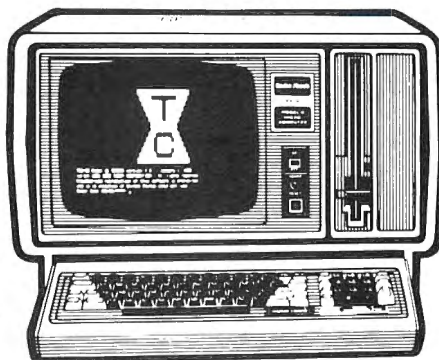
# NOCONA

## ELECTRONICS

**MODEL 4D**



**MODEL 6000**



**MODEL 1000**



|                                  |         |                                  |         |
|----------------------------------|---------|----------------------------------|---------|
| 512K MOD 3000 W/20 MEG HD .....  | 2499.00 | 512K MOD 3000 .....              | 1819.00 |
| 640K MOD 3000 W/35 MEG HD .....  | 3549.00 | DMP 105 PRINTER .....            | 145.00  |
| 256K MOD 1200 HD 1 DR. ....      | 1499.00 | DMP 130 PRINTER .....            | 249.00  |
| 128K MOD 1000 W/MONO 1 DR. ....  | 759.00  | DMP 430 PRINTER .....            | 499.00  |
| 128K MOD 1000 W/COLOR 2 DR. .... | 1099.00 | DMP 2100P PRINTER .....          | 1019.00 |
| 24K MOD 102 PORT .....           | 369.00  | DWP 220 PRINTER .....            | 329.00  |
| 24K MOD 100 PORT .....           | 179.00  | DWP 510 PRINTER .....            | 999.00  |
| 24K MOD 200 PORT .....           | 679.00  | TRACTOR DWP 220 .....            | 99.00   |
| 32K MOD 600 PORT .....           | 1149.00 | TRACTOR DWP II/510 .....         | 159.00  |
| 64K MOD 4D 2 DR. ....            | 839.00  | TRACTOR FEED DMP2100P .....      | 99.00   |
| 512K MOD 6000 W/15 MEG HD .....  | 2579.00 | 384K MOD 1000 W/10 MEG HD .....  | 1412.00 |
| 64K COLOR COMPUTER .....         | 139.00  | PARALLEL PRINTER CONTROLLER .... | 179.00  |
| 35 MEG HARD DISK .....           | 2059.00 | 70 MEG HARD DISK .....           | 2679.00 |
|                                  |         | NEW DMP 2200 PRINTER             | 1149.00 |

**100% RS COMPONENTS NO FOREIGN DRIVES OR MEMORY FULL WARRANTY**

**ALL RS SOFTWARE 20% OFF CATALOG PRICE**

**CASHIERS CHECK OR MONEY ORDER MUST ACCOMPANY ALL ORDERS**

**(817) 825-4027**

**NOCONA ELECTRONICS • BOX 593 • NOCONA, TX 76255**

clusively for all the Z80 Assembly-language programs I write.

A note to EDAS 4.2 users: After you enter EDAS 4.2 and then enter and assemble the following two lines as VCTRL/FLT:

```
100 *GET LISTING1
110     END INIT
```

Change line 100 to GET LISTING2 and assemble it as FCTRL/FLT.

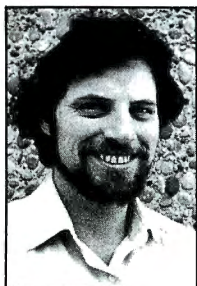
Change line 100 to GET LISTING2 and assemble it as FCTRL/FLT.

## Work in Progress

I mentioned earlier that new versions of TRSDOS 6 and LDOS are being planned. For the last several months (I'm writing this in early May), members of the LDOS Forum on CompuServe have discussed features the new versions should and shouldn't include. Need for new versions is obvious: Neither currently allows dates later than December 31, 1987, either at bootup or in the date stamps attached to each directory entry. The problem is how to allow for later dates without causing date stamps on current files to be misinterpreted.

The solution will require recoding many parts of both operating systems. It probably will also mean the disappearance of user passwords in order to make room for the new dates, although owner passwords on files will remain. Instead, every file might gain a time stamp along with a date stamp. With the time stamp added, it will be possible to write or buy a program that automatically updates all necessary modules (and only necessary modules) of a complicated, multi-module program whenever one module is changed.

Several other interesting changes are being planned for the operating systems. By the time you read this, work on both versions might have already begun. Nevertheless, if you have ideas about how each could be improved, and especially if your ideas don't require a huge expansion of the operating systems, you might want to stop by the LDOS Forum on CompuServe and offer your ideas to the people who will be writing the new systems. ■



*Write Hardin Brothers at 280 N. Campus Ave., Up-land, CA 91786. Enclose a stamped, self-addressed envelope for a reply. You can also contact Hardin on CompuServe's WE-SIG (PCS-117).*

### Listing 2 continued

```
02010     INC     HL           ;HL=> LOWCTRL in VCTRL filter
02020     LD     A,(HL)       ;Get current flag
02030     CPL           ;Invert it
02040     LD     (HL),A       ;And put it back
02050     DEC     HL           ;HL=> VSTATE in VCTRL
02060     CALL  STATUS       ;Show display
02070     SREL_2 EQU    $-2
02080     JR     NO_RET       ;And then go
02090 ;
02100 SENDOUT SVC    @DSP     ;Display character in C
02110 NO_RET POP    HL       ;Recover registers
02120     POP    DE
02130     POP    BC
02140     POP    AF
02150     OR     1           ;Set NZ flag
02160     LD     A,0         ;Send back no character
02170     RET           ;Back to calling routine
02180 ;
02190 FLTEND EQU    $-1
02200 FLTLEN EQU    $-BEGIN
02210 VSTATE EQU    $
02220 STATUS EQU    $           ;This will keep the assembler happy
02230 ;
02240 ;-----
02250 ; The rest of the program is initialization code that
02260 ; is thrown away when the program is relocated to protected
02270 ; high memory.
02280 ;-----
02290 ;
02300 INIT EQU    $
02310     PUSH  DE           ;Save for later
02320     LD     DE,VMODNAM    ;Module name for VCTRL filter
02330     SVC    @GTMOD       ;Is it in memory?
02340     JR     Z,SET_PTR    ;Yes -- go
02350     LD     HL,NOVCTRL    ;Else point HL to error msg
02360     JR     ERR_OUT     ;And leave
02370 ;
02380 SET_PTR LD     DE,0EH    ;Offset to VSTATE
02390     ADD  HL,DE           ;HL=> VSTATE in VCTRL
02400     LD     (SREL_1),HL  ;Save in our program
02410     LD     DE,95H-0EH   ;Offset to STATUS routine
02420     ADD  HL,DE           ;HL=> STATUS in VCTRL
02430     LD     (SREL_2),HL  ;Save in this program
02440     POP    DE           ;Recover original value
02450 ;
02460 *GET     INSTALL
02470 ;
02480 RELTAB DW    REL_1,REL_2,REL_3
02490     DW    0
02500 ;
02510 CR EQU    13
02520 LF EQU    10
02530 ;
02540 VMODNAM DB    'VCTRL',0
02550 MODNAME DB    'FCTRL',0
02560 ;
02570 NOVCTRL DB    'You must install the VCTRL program before installing',LF,CR
02580     DB    'this program. Installation aborted.',LF,CR
02590 ;
02600 SIGNON DB    'Model 4 Function-Key/Video Control Program',LF,CR
02610 ;
02620 SUCCESS DB    'Installation successfully completed.',LF
02630     DB    'Use the FILTER command to connect to *KI',LF,CR
02640 ;
02650     END     INIT
```

End

### Program Listing 3. Run this program to see all 896 display characters on screen. (See p. 112 for information on the checksums in this listing.)

```
1 'Demonstration program to display all Model 4           ** 49
2 'displayable characters. Install Listings 1 and 2,      ** 50
3 'then press <Shift F1>, before running this program.  ** 51
4 '                                                       ** 123
10 CLS                                                    ** 355
20 PRINT CHR$(23);                                       ** 1057
30 PRINT " ";                                           ** 783
40 FOR Z = 0 TO 15                                       ** 987
50   PRINT HEX$(Z);" ";                                 ** 1280
60 NEXT Z                                               ** 575
70 PRINT: PRINT                                          ** 1019
80 FOR Z = 0 TO 15;                                       ** 1049
90   PRINT HEX$(Z);" ";                                 ** 1348
100  FOR X = 0 TO 15                                       ** 1094
110   CHAR = Z*16 + X:                                     ** 1205
120   CHAR$=CHR$(CHAR)                                    ** 1314
130   IF CHAR < 32 THEN PRINT CHR$(0);                  ** 2267
140   PRINT CHAR$;" ";                                   ** 1278
150 NEXT X                                               ** 685
160 PRINT                                                ** 644
170 NEXT Z                                               ** 625
180 PRINT: PRINT                                         ** 1069
                                           End
```

## Program Listing 4. Installation module for Listings 1 and 2.

```

L00100 ;-----
00110 ; This is the installation module for both programs.
00120 ;
00130 ; See text for instructions on assembling it with the other
00140 ; modules.
00150 ;-----

00160 PUSH DE ;Save our DCB pointer
00170 LD (MODDCB),DE ;Stuff into filter header
00180 PRINT SIGNON ;Announce this program
00190 LD DE,MODNAME ;Get our module name
00200 SVC @GTMOD ;Already installed?
00210 JR NZ,VIASET ;No -- go
00220 LD HL,INSTLTD ;Else HL==> error msg.
00230 ;
00240 ERR_OUT SVC @DSPLY ;Show the error message
00250 LD HL,-1 ;Return an error to TRSDOS
00260 SVC @EXIT ;And leave

00270 ;-----
00280 ; Installed with SET command?
00290 ;-----

00300 VIASET SVC @FLAGS
00310 BIT 3,(Y+'C'-'A') ;Test SET bit of CFLAG$
00320 JR NZ,SETHI ;Go if bit is on
00330 LD HL,NOSET ;Else HL==> error msg.
00340 JR ERR_OUT ;And leave

00350 ;-----
00360 ; Reset HIGH$
00370 ;-----

00380 SETHI LD HL,0 ;Get the current value
00390 LD B,L ;Select HIGH$
00400 SVC @HIGH ;Get current HIGH$
00410 LD (OLDHI),HL ;Stuff into the filter header
00420 JR Z,RELOC ;Go if no error
00430 LD HL,MEMERR ;Else HL==> error msg.
00440 JR ERR_OUT ;And go

00450 ;-----
00460 ; Resolve memory references
00470 ;-----

00480 RELOC LD IY,RELTAB ;IY==> Relocation table
00490 LD DE,FLTEND ;DE==> End of filter
00500 XOR A ;Clear carry flag
00510 SBC HL,DE ;Calculate distance to move
00520 PUSH HL ;Transfer distance
00530 POP BC ; to BC register
00540 ;
00550 RELOC1 LD L,(IY+0) ;Get LSB of first mem. ref. address
00560 LD H,(IY+1) ;And the MSB
00570 LD A,H ;Test the MSB
00580 OR A ;Is it 0?
00590 JR Z,MOVE ;Yes -- go
00600 LD E,(HL) ;No -- get mem. ref
00610 INC HL ; into the DE register
00620 LD D,(HL) ; so it can be changed
00630 EX DE,HL ;DE has pointer, HL has value
00640 ADD HL,BC ;Add the offset to it
00650 EX DE,HL ;Put it back in DE
00660 LD (HL),D ;Put value back
00670 DEC HL ; into the program
00680 LD (HL),E ; in relocated form
00690 INC IY ;Point to next value
00700 INC IY ; in the relocation table
00710 JR RELOC1 ;And try again

00720 ;-----
00730 ; Move and protect the filter
00740 ;-----

00750 MOVE LD DE,(OLDHI) ;Get the destination
00760 LD HL,FLTEND ;And the end of the filter
00770 LD BC,FLTLEN ;BC = bytes to move
00780 LDDR ;Move it all
00790 EX DE,HL ;New HIGH$ is now in HL
00800 LD B,0 ;Select: work with HIGH$
00810 SVC @HIGH ;Set new high$
00820 INC HL ;HL = Program entry point

00830 ;-----
00840 ; Set the DCB in TRSDOS
00850 ;-----

00860 POP IX ;Get dcb address from the stack
00870 LD (IX),40H.OR.7 ;Set as filter capable of @GET,@PUT,@CTL
00880 LD (IX+1),L ;Set transfer address
00890 LD (IX+2),H ; into DCB
00900 PRINT SUCCESS ;We're almost done
00910 LD HL,0 ;Return "success" to TRSDOS
00920 SVC @EXIT ;And leave
00930 ;
00940 INSTLTD DB 'Program already in memory -- installation aborted.',LF,CR

00950 ;
00960 NOSET DB 'Program must be installed with the SET command.',LF,CR
00970 ;
00980 MEMERR DB 'High memory not available for installation.',LF,CR
00990 ;
01000 END ;End of this module
    
```

End

**TKO.**  
master utility

Four powerful functions to complement your every activity. T.K.O. is a terminal/modem program, screen-oriented line editor, print spooler and macro-key utility that can be called from just about any program. Just think, you can leave BASIC, dial up a BBS, dump a listing to the printer, grab a line of text from the screen and return to BASIC without losing a stitch. We can only hint at the power of T.K.O., you owe it to yourself to give it a try today! (for Model 4/4P/4D with TRSDOS 6.x)

check here to order T.K.O. @ \$69.95

**NEW!**

**direct**

The DOS assist that makes using your Model 4/4P/4D a snap. Just a few short keystrokes and you can select one or more files that can be Executed/Renamed/Listed/Removed and Copied at the touch of a key! Then there's a unique feature that lets you type in more than one DOS library command on the same line, and that's only a few of the features that are provided in this impressive utility for fast relief from the headaches of dealing with TRSDOS 6.2, take "DIRECT" relief from SOTA Computing Systems Limited.

check here to order DIRECT @ \$59.95

**NEW!**

**day by day**

If what you need is a professional appointment/calendar program, here's a full featured economical alternative to those expensive and awkward multi-function utilities like DESKMATE. Day-by-Day is the practical choice for users who want to use their Model 4/4P/4Ds to help organize their busy schedules. With features like auto-reminders, an address book, and printer options, you'll find all the power you could ever want in this well-crafted application. Start doing things everyday with Day-by-Day.

check here to order DAY-BY-DAY @ \$59.95

**NEW!**

**TRScat**

At last there's a disk catalogue program for the Model 4/4P/4D. End the frustrating hours of searching for disk files and turn your file cataloging chores over to TRScat. The program includes options for saving, loading, viewing, and sorting files as well as options for preparing print-outs of your sorted files. Don't waste your valuable time any longer, order TRScat for your computer today!

check here to order TRScat @ \$39.95

**fast80 BBS**

now 300/1200 baud

The best BBS for the Model 4/4P/4D just got better! *fast80* now supports 300/1200 baud operation and is compatible with every Radio Shack direct connect auto-answer modem (Hayes and compatibles too). With minimum disk access, lightning fast response, hard drive compatibility, and a large message and user base, *fast80* is the BBS of choice for the discriminating SYSOP. (Requires 128K and runs with TRSDOS 6.2.x or DOSPLUS 4.x) **Try before you buy! • Call the SOTA BBS at (604) 688-5061 • 24 Hours a Day**

check here to order fast80 (2nd Edition) @ \$79.95

**NEW • VERSION 2 • NEW**

**FORTH**

No other FORTH has such features at such an affordable price. Includes a complete string handling package, floating point math, screen editor and beginner's tutorial. With FORTH from SOTA you can run in native (direct disk) or DOS (DOS file) mode. You can easily create /CMD files too! No royalties or site licensing required - for all the programming power you wish you had - order FORTH from SOTA today.

check here to order FORTH @ \$149.95  
choose 1 of:  Model I  Model III  Model 4/4P/4D  
 DCP/M (Ver 2.x)  DCP/M Plus (Ver 3.x)

**microZap**  check here to order @ \$49.95

The ultimate disk zapping utility for the Model 4/4P/4D. Runs with TRSDOS 6.2.x or DOSPLUS 4.x and will read Model I-III-4 and CP/M sectors, single or double density, one or two sides, 35 to 80 tracks.

**designe**  check here to order @ \$39.95

A must for the Model 4/4P/4D BASIC or Assembly Language Programmer. Create imaginative screen displays using *designe's* powerful screen editor - then let *designe* prepare source files to reproduce your art.

**HOW TO ORDER:**

**INSTRUCTIONS:** Check off the products you wish to order and remit this ad together with the total amount (US Funds). We accept payment by check, money-order, VISA or MasterCard (if paying by charge card, please remember to include your card number and expiry date). Prices include shipping. Purchase orders welcome but are subject to a \$5.00 handling fee. Prices are higher outside the U.S. and Canada - write for details.

**MOST IMPORTANTLY • DON'T FORGET TO INCLUDE YOUR FULL NAME & ADDRESS WITH YOUR ORDER**

**ORDER TODAY**

213-1080 Broughton Street  
Vancouver, B.C.  
Canada • V6G 2R8

Order by Mail or Phone  
MasterCard • (604) 688-5009 • VISA

**SOTA** Computing Systems Limited

TRS-80 & TRSDOS are registered trademarks of Radio Shack.

# SAVE A BUNDLE

**WITH ONE OF OUR BUNDLES**

We have put together special bundles of software just in time to save you a bundle of money. Didn't you ever wonder why CP/M was so popular? The reason is the software availability. All programs (except EP) are for the Model 4/4P and have been optimized to install and run without hassle. For example, we have memory-mapped WordStar® and it runs circles around the standard version available elsewhere. We also added printer drivers for the Daisywheel II and the DMP-2100. Our CP/M® 2.2 is the best around. Read the reviews. You know the programs. You know the prices. This is the years' best value. You owe it to yourself to let these CP/M® programs and thousands of others (many in the public domain) start serving your needs.

**Bundle #1**  
 WordStar®  
 MailMerge®  
 SpellStar™  
 StarIndex™  
 Montezuma Micro CP/M®  
**\$299**  
 Delivered  
 RETAIL VALUE \$1009

**Bundle #5**  
 Electric Pencil™  
 Red Pencil™  
 Blue Pencil™  
**\$79**  
 Delivered  
 Works with TRSDOS, NEWDOS-80,  
 DOSPLUS and MULTIDOS  
 (Model 1,3,4)  
 RETAIL VALUE \$240

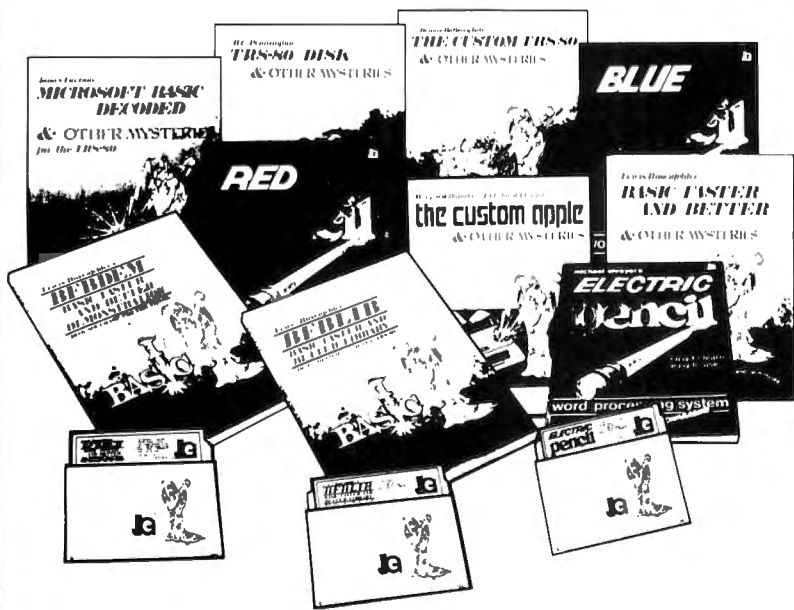
**Bundle #2**  
 WordStar®  
 DataStar™  
 ReportStar™  
 CalcStar™  
 Montezuma Micro CP/M®  
**\$333**  
 Delivered  
 RETAIL VALUE \$1354

**Bundle #3**  
 WordStar®  
 MailMerge®  
 SpellStar™  
 StarIndex™  
 DataStar™  
 ReportStar™  
 CalcStar™  
 Montezuma Micro CP/M®  
**\$444**  
 Delivered  
 RETAIL VALUE \$1699

**Bundle #4**  
 WordStar®  
 MailMerge™  
 SpellStar™  
 StarIndex™  
 dBASE II®  
 TurboPascal™  
 Montezuma Micro CP/M®  
**\$555**  
 Delivered  
 RETAIL VALUE \$1553

## Save A Bundle on these books and disks

Take advantage of our volume discounts. Buy any three items from this list and deduct \$5 from your total order. Buy four...deduct \$10. Buy five...deduct \$15. Buy six...deduct \$20 and so on. Buy a bunch, save a bundle. Please add \$1 each for shipping. Add \$5 to orders under \$50 for handling.



- TRS-80 Disk & Other Mysteries.** The "How to" book of data recovery for the TRS-80 Model I disk operating system. 128 pages. Retail \$22.50 **Now \$18**
- Microsoft BASIC Decoded & Other Mysteries.** The complete guide to Level II and BASIC. 312 pages. Retail \$29.95 **Now \$24**
- The Custom TRS-80 & Other Mysteries.** The complete guide to customizing TRS-80 Hardware and Software. 336 pages. Retail \$29.95 **Now \$24**
- BASIC Faster & Better & Other Mysteries.** The complete guide to BASIC programming tricks and techniques. 290 pages. Retail \$29.95 **Now \$24**
- BASIC Faster & Better Library Disk.** Contains 121 functions, subroutines and user routines. Search merge, compare and listing routines plus array handlers, BASIC overlays and video drivers. Retail \$19.95 **Now \$16**
- BASIC Faster & Better Demonstration Disk.** Contains 32 demos of the Library Disk contents above. Retail \$19.95 **Now \$24**
- BASIC Disk I/O Faster & Better & Other Mysteries.** Programming tips and techniques to store/retrieve data from disk. 432 pages. Retail \$29.95 **Now \$24**
- BASIC Disk I/O Faster & Better Demonstration Disk.** All of the major demo programs and library of disk I/O subroutines in 25 BASIC programs. Random, Indexed Sequential and TREESAM file handlers included. Retail \$29.95 **Now \$24**
- Machine Language Disk I/O & Other Mysteries.** A guide to machine language disk I/O for the TRS-80. 288 pages. Retail \$29.95 **Now \$24**
- TRSDOS 2.3 Decoded & Other Mysteries.** Detailed explanation of the Model I disk operating system. 298 pages. Retail \$29.95 **Now \$24**
- How To Do It On The TRS-80.** A complete applications guide to the TRS-80 Model I, II, III, 100, and Color Computer. 352 pages. Retail \$29.95 **Now \$24**
- The Custom Apple & Other Mysteries.** Who cares? Retail \$29.95 **Now \$19**

Due to the nature of this business, there are **NO REFUNDS** on software. We accept American Express, MasterCard, Visa and COD. Your card is not charged until we ship your order. Personal and company checks are accepted without delay (call for details). Delivered prices are for the lower rightmost 48 States only. Prices and specifications subject to change without notice. If you don't understand any of this, just give us a call and we will take the time to explain it until you do. First-timers are always welcome here.

© 1984 by Montezuma Micro. WordStar®, SpellStar™, StarIndex™, MailMerge®, DataStar™, ReportStar™ and CalcStar™ belong to MicroPro® International Corporation. CP/M® belongs to Digital Research Inc. dBASE II® belongs to Ashton-Tate, Inc. All the Pencils™ belong to Michael Shrayser. Turbo Pascal™ belongs to Borland International.



# MONTEZUMA MICRO

214-339-5104  
 Redbird Airport, Hangar #8  
 P.O. Box 32027  
 Dallas, Texas 75232 "WE KEEP YOU RUNNING"



**ORDER NOW . . . TOLL FREE**  
**800-527-0347**  
**800-442-1310**

The Toll Free lines are for orders only. Specifications subject to change without notice.





# MONTEZUMA MICRO

P.O. Box 2169  
Camp Verde (Lizard Flats)  
Arizona 86322

"WE KEEP YOU RUNNING"

## MONTE SEES THE LIGHT!!!

After much thought and deliberation our founder, Monte Zuma, has decided (admitted) the future lies with MS-DOS and the Model 4/P/D using Montezuma CP/M. Consequently, from this time forward, our efforts will be directed toward Model 3/4 hardware, CP/M and MS-DOS. Thanks to all of you who have placed your confidence in us in the past. We invite you to join with us as we journey into the next generation. We offer a wide range of products for both MS-DOS and CP/M. Should you need an item not listed just ask about it. We have much more than can be shown here. Our friendly staff and near-perfect service is just a toll-free call away.

## CALL TOLL-FREE FREE SHIPPING! \*

\*(For orders over \$100)

**BUY FROM US RIGHT NOW!**

(Please read the fine print first)

### MS-DOS BUSINESS SOFTWARE

|                               |        |
|-------------------------------|--------|
| Accounting Partner I          | \$ 279 |
| Accounting Partner II         | 699    |
| Borland Turbo Lightning       | 53     |
| BPI AP/AR/GL/Payroll          | 319    |
| BPI Inventory                 | 477    |
| DAC Easy Accounting           | 49     |
| DAC Easy Payroll              | 49     |
| dBase III Plus                | 379    |
| Framework II                  | 469    |
| Lotus 1-2-3, Use Twin         | 79     |
| Microsoft Multiplan           | 127    |
| Microsoft Word                | 249    |
| MultiMate                     | 239    |
| PFS:File                      | 88     |
| PFS:Graph                     | 88     |
| PFS:Report                    | 79     |
| PFS:Write                     | 88     |
| R:Base 5000 1.01              | 379    |
| R:Base Extended Report Writer | 85     |
| Reflex: The Analyst           | 53     |
| Sidkick, non-protected        | 49     |
| Superkey                      | 37     |
| Twin, 1-2-3 Clone             | 79     |
| V P Planner                   | 56     |
| Word Perfect 4.1              | 239    |
| WordStar 2000 Plus 1.01       | 299    |
| WordStar 3.31                 | 189    |

### MS-DOS EDUCATIONAL SOFTWARE

|                  |       |
|------------------|-------|
| Mastertype       | \$ 26 |
| Math Blaster     | 29    |
| Mind Prober      | 30    |
| Spell It!        | 29    |
| Typing Tutor III | 32    |
| Word Attack      | 29    |

### MS-DOS

SYSTEMS - UTILITIES - LANGUAGES

|                                |       |
|--------------------------------|-------|
| Bourbaki "1 Dir"               | \$ 59 |
| Crosstalk XVI                  | 99    |
| Microsoft Windows              | 63    |
| Microsoft Quick BASIC Compiler | 69    |
| Norton Utilities               | 55    |
| Sideways                       | 39    |
| Smartcom II                    | 88    |
| Superkey                       | 39    |
| Turbo Editor Toolbox           | 39    |
| Turbo Gameworks                | 39    |
| Turbo Graphics Toolbox         | 30    |
| Turbo Pascal                   | 39    |
| Turbo Tutor                    | 19    |

### RODENTS

|                                |        |
|--------------------------------|--------|
| Microsoft Parallel w/PC Paint  | \$ 129 |
| Microsoft Serial w/PC Paint    | 139    |
| Mouse Systems Mouse w/PC Paint | 139    |
| Willard/Ben Combo w/Friends    | CALL   |

### ADD-ON MEMORY & UPGRADES

|                                 |      |
|---------------------------------|------|
| 16K RAM, 200nsec, 8 chips       | \$ 9 |
| 64K RAM, 150/200nsec, 8 chips   | 16   |
| Model 4 128K RAM kit w/PAL chip | 26   |
| 64K RAM Upgrade set of 9 chips  | 18   |
| 256K RAM Upgrade set of 9 chips | 39   |
| 8087 Numeric coprocessor, std   | 119  |
| 8087 Numeric coprocessor, fast  | 149  |
| 80287 Numeric coprocessor, std  | 179  |
| 80287 Numeric coprocessor, fast | 399  |
| NEC V20 Wonder Chip, 5mHz       | 13   |
| NEC V20 Wonder Chip, 8mHz       | 23   |
| Model 1 RS-232 Kit complete     | 89   |
| Model 3/4 RS-232 Kit complete   | 69   |
| Model 3/4 Internal Drive Kit    | 169  |

### MODEMS

|                                |        |
|--------------------------------|--------|
| Anchor Signalman 1200 external | \$ 279 |
| Anchor Signalman 2400 external | 415    |
| Anchor 1200 int w/software     | 199    |
| Anchor 2400 int w/software     | 335    |
| Hayes 300 external             | 149    |
| Hayes 1200 external            | 399    |
| Hayes 1200B internal w/SCom    | 369    |
| Hayes 2400 external            | 599    |
| Hayes 2400B internal w/SCom    | 569    |

### ACCESSORIES

|  |       |
|--|-------|
| Sony 5" 2DD disks, box of 10                         | \$ 13 |
| Our own 5" 2DD disks, bag of 10                      | 9     |
| Flipsort, holds 50 5" diskettes                      | 15    |
| Tilt and Swivel Monitor Stand                        | 19    |
| Vert CPU Stand PC/XT/CLONE                           | 25    |
| 2-position Printer Switch                            | 49    |
| 2-position RS-232 Switch                             | 49    |
| Standby Power Supply, 300 Watt output for 20 minutes | 249   |

### CP/M SOFTWARE

|                                    |        |
|------------------------------------|--------|
| WordStar 3.3                       | \$ 250 |
| WordStar Professional              | 450    |
| ReportStar                         | 150    |
| DataStar                           | 175    |
| CalcStar                           | 95     |
| Multiplan                          | 159    |
| Supercalc II                       | 199    |
| Turbo Pascal                       | 45     |
| Turbo Tutor                        | 23     |
| Turbo Editor Toolbox               | 45     |
| Turbo Holiday Pak                  | 99     |
| Pickles & Trout CP/M Mod 2, 12, 16 | 180    |

*All of the above CP/M software is available in various 5-1/4" formats as well as 8" standard CP/M format. Please specify format and include \$10 per disk additional.*

### IBM - CLONE - MS-DOS BOOKS & MANUALS

|                           |       |
|---------------------------|-------|
| IBM BASIC Faster & Better | \$ 22 |
| IBM BASIC Disk for above  | 16    |
| IBM BASIC Manual 3rd Ed   | 19    |
| Running MS-DOS 2nd Ed     | 17    |
| Using 1-2-3 Release 2     | 14    |
| Using Wordperfect 4.1     | 13    |
| Using Displaywrite 3.0    | 13    |
| PC-DOS Performance Guide  | 14    |
| Norton Programmer's Guide | 15    |
| 1-2-3 Tricks, Tips, Traps | 13    |
| 1-2-3 Macro Library       | 15    |

See opposite page for more books.

### TRS-80 BOOKS & SOFTWARE

|                                  |       |
|----------------------------------|-------|
| Modem 80 M1/3 Com Program        | \$ 33 |
| Trackcess. M3. Orig Copy Program | 19    |
| Super Utility Plus 3.2 M1/3/4    | 49    |
| Super Utility Plus M4-4P only    | 49    |
| SuperCROSS/XT Specify M1/3/4     | 79    |
| Convert 3 to PC M3 BASIC to PC   | 119   |
| Convert 4 to PC M4 BASIC to PC   | 119   |
| TRS-80 Beginners Guide           | 13    |
| Using Super Utility Plus         | 16    |
| TRS-80 M4/4P Technical Manual    | 33    |
| TRS-80 M1000 Technical Manual    | 25    |
| Using Super Utility Plus 3.x     | 16    |

See opposite page for more books.

Our inventory is so large it can not be listed completely. Please call us if you do not see what you want. Chances are we have it or can get it right away. Because of the time lag in magazine advertising our prices are subject to change without notice. Our prices are for mail order only. We are only human so we decline responsibility for typographical errors. We welcome your company and/or personal checks. We use TeleCheck. Please follow these simple rules so your order will not be delayed. The check must be drawn on a US or Canadian bank and be payable in US Dollars. Your check must be bank printed and contain your street address (not PO Box or APO/FPO) and telephone number. The signature must exactly match the name printed on the check. That's all there is to it. We also accept American Express, MasterCard, Visa, Cashier's Checks, electronic funds transfer and we ship COD. COD's and motor freight shipments may require a deposit. Some special items may require a deposit. **ALL COD's** require cash on delivery. Company and/or personal checks can **NOT** be accepted in payment of COD shipments. Your credit card is not charged until we ship your order. Ground shipping charges are included on all orders over \$100. Add \$10 handling plus shipping to all orders under \$100. We do not collect State Sales Tax on orders shipped outside of Texas. Orders placed by 5PM will be shipped the next day if stock is on hand. Your order will leave before we go home. The responsibility of suitability of software rests with the purchaser. Due to the nature of the business and product there are **NO REFUNDS ON SOFTWARE**. Please do not buy software from us if you are not sure it will work for you. **SOFTWARE IS NOT RETURNABLE**. Software support is provided by the manufacturer. We will **PROVIDE A REPLACEMENT ONLY** if your disk is defective if you notify us within 30 days after delivery of your merchandise. Please call us for help and instructions should you have a problem.

### WARRANTY

All items carry the manufacturers' warranty and any problem in service will be handled by his service organization. We will be happy to mail you a copy of the warranty on request.

CALL TOLL FREE FROM ANYWHERE IN THE USA

**800-527-0347**  
**800-442-1310**



# How to Use 80 Micro Program Listings

Basic program listings in *80 Micro* now include a checksum value at the end of each line. This value is the sum of the ASCII values of all characters and spaces in the line, excluding remarks. With our Checksum program, you can use these values to test the accuracy of your typing after you copy listings from the magazine. Also, for easy reading, listings are formatted so that each new program line is set off on the left.

To check your typing, follow these steps:

- Type in program code exactly as listed, omitting the indentations when program lines continue to a second or third magazine line, the \* characters and checksum values, and any comments after a program statement.

- Save the program in ASCII format with the command SAVE "file name",A.

- Load and run Checksum (see the Program Listing). The program will prompt you for the name of the file to be verified and give you the option of sending the line numbers and checksum values to the printer or to the screen. Enter P for printer, S for screen.

When printing to the screen, Checksum lists 14 lines and then waits for you to press the enter key. You can type in comment lines, but Checksum ignores comments marked with an apostrophe.

- Compare the displayed line numbers and checksum values with the checksums shown in the listing. Find and correct errors in lines having checksum values that don't match.

—Beverly Woodbury  
Technical Editor

## Program Listing. Checksum.

```

10 'CHECKSUM/BAS by Beve Woodbury -- 2/7/86          ** 97
20 CLEAR 1000:CLS:PRINT#140,"VERIFY CHECKSUMS ON PROGRAM" ** 3714
30 PRINT:PRINT:INPUT "Enter name of file to verify";F$ ** 4278
40 PRINT:PRINT:PRINT "List Checksums to:"           ** 3234
50 PRINT TAB(20) "<P>rinter":PRINT TAB(20) "<S>creen" ** 3629
60 PRINT:PRINT:PRINT TAB(30);"? ";                 ** 2149
70 K$=INKEY$                                         ** 727
80 IF K$="P" OR K$="p" OR K$="S" OR K$="s" THEN 90 ELSE 70 ** 3272
90 PRINT K$:IF K$="P" OR K$="p" THEN LP=1           ** 2440
100 OPEN "I",L,F$                                     ** 899
110 IF EOF(1) THEN CLOSE:END                         ** 1715
120 LINE INPUT#1,L$:L=VAL(LEFT$(L$,6))              ** 2276
130 IF Z=2 AND L=0 THEN 110                          ** 1529
140 A=VARPTR(L$):GOSUB 280:Q=PEEK(A)                ** 2246
150 LS=PEEK(A+1):MS=PEEK(A+2):A=MS*256+LS:GOSUB 280 ** 3117
160 IF INSTR(L$,") THEN GOSUB 300                   ** 988
165 IF RIGHT$(L$,1)=" " THEN IQ=Q:GOSUB 320         ** 2514
170 Z=2                                               ** 385
180 FOR K=1 TO Q:P=PEEK(A):CS=CS+P:A=A+1:NEXT K     ** 2946
190 IF CS=0 THEN 110                                 ** 1133
200 IF CS<100000! THEN D$="-"                      ** 1530
210 IF CS<10000 THEN D$="- "                       ** 1482
220 IF CS<1000 THEN D$="- "                       ** 1467
230 IF CS<100 THEN D$="- "                        ** 1452
240 IF LP=1 THEN LPRINT "Line";L;D$;CS:CS=0:GOTO 110 ** 3372
250 PRINT "Line";L;D$;CS:CS=0:X=X+1                ** 2283
260 IF X=14 THEN X=0:PRINT TAB(30) "Press <ENTER> to continue."
    ELSE 110                                         ** 4929
270 K$=INKEY$:IF K$<>CHR$(13) THEN 270 ELSE 110   ** 2708
280 IF A>32767 THEN A=(65536!-A)*-1                 ** 1871
290 RETURN                                           ** 667
300 I=INSTR(L$,") :IQ=I-1                           ** 943
310 IF LEN(L$)=INSTR(L$,") THEN RETURN             ** 1462
320 FOR I=IQ TO 1 STEP -1                           ** 1482
330 C=ASC(MID$(L$,I,1))                             ** 1263
340 IF C<33 THEN NEXT I                             ** 1378
350 RL$=LEFT$(L$,I) :Q=LEN(RL$) :RETURN            ** 2320
    
```

End

## 80 MICRO'S LIST of ADVERTISERS

| Reader Service Number | Page  | Reader Service Number | Page                                      | Reader Service Number | Page  |
|-----------------------|---|-----------------------|---|-----------------------|---|
| • 82                  | Aerocomp . . . . . 56, 57, 143                  | • 45                  | Electric Webster . . . . . 1              | • 75                  | Radio Shack . . . . . 72, 73, 125, 135        |
| • 202                 | Aerocomp . . . . . 93                           | 214                   | Ft. Worth Computers . . . . . 75          | 371                   | Seatronics . . . . . 91                       |
| • 215                 | Alcor Systems . . . . . 29                      | • 90                  | Freedom Electronics . . . . . 11          | 45                    | Software Sales . . . . . 91                   |
| 30                    | Allwrite (Prosoft) . . . . . 9                  | *                     | GE Information Services . . . . . 87      | • *                   | Software Support . . . . . 120, 121, 136, 137 |
| 17                    | Alpha Products . . . . . 13, 15                 | 271                   | Gridcom . . . . . CII                     | 427                   | SOTA Computing Systems Ltd. . . . . 109       |
| 374                   | ALPS . . . . . 85                               | • 9                   | H & E Computronics . . . . . CIV          | 444                   | Southwestern Digital . . . . . 60             |
| • 141                 | Anitek Software Products . . . . . 23           | • 455                 | Hard Drive Specialist . . . . . 69        | 395                   | Spectrogram Magazine . . . . . 140            |
| 400                   | Anthropomorphic Systems . . . . . 132           | 355                   | H.D.P. . . . . 85                         | 71                    | Sublogic Communications . . . . . 118         |
| • 378                 | ATD . . . . . 48, 48A                           | • 491                 | HJL Products . . . . . 127                | 456                   | Sunlock Systems . . . . . 145                 |
| • 238                 | Automation Facilities . . . . . 79              | 175                   | Howe Software . . . . . 115               | 297                   | SJS Engineering . . . . . 86                  |
| • 152                 | BCCOMPCO . . . . . 10                           | 46                    | Hypersoft . . . . . 118                   | • 520                 | TCE . . . . . 128, 129                        |
| 145                   | Beaman Porter . . . . . 103                     | • 101                 | J & M Systems, Ltd. . . . . 131           | • 81                  | Total Access . . . . . 70                     |
| 301                   | Big D Computers . . . . . 117                   | • 534                 | Jameco Electronics . . . . . 103          | • 198                 | Travelling Software . . . . . 77              |
| 186                   | Blue Ridge Software . . . . . 146               | 485                   | Kalgio Electronics . . . . . 147          | 227                   | Trisoft . . . . . 146                         |
| 300                   | BT Enterprises . . . . . 81                     | *                     | Langley-St. Clair . . . . . 99            | • 247                 | True Data Products . . . . . 138, 139         |
| 86                    | Compulogic Corp. . . . . 151                    | • 450                 | Laptop Systems . . . . . 76               | 278                   | Touchstone Technology . . . . . 144           |
| 78                    | Compuserve . . . . . 51                         | *                     | Lindbergh Systems . . . . . 85            | 261                   | Turner-Hall Publishing . . . . . 63           |
| 242                   | Computamerica . . . . . 79                      | 235                   | LSR Learning . . . . . 103                | 289                   | Warp Speed Computer Products . . . . . 88     |
| • 443                 | Computer Center, The . . . . . 141              | • 311                 | Manzana Micro Systems, Inc. . . . . 113   |                       |   |
| 357                   | Computer Friends . . . . . 99                   | • 250                 | Marymac Industries, Inc. . . . . 147      |                       |   |
| • 18                  | Computer Plus . . . . . 124                     | 299                   | Microdex Corp. . . . . 55                 |                       |   |
| 142                   | Computer Supplies of Peterborough . . . . . 119 | • 464                 | Micro Labs, Inc. . . . . 150              |                       |   |
| 415                   | Computer System Consultants . . . . . 132       | • 346                 | Microlite Corp. . . . . 63                |                       |   |
| • 45                  | Cornucopia Software . . . . . 1                 | • 107                 | Misosys, Inc. . . . . 37, 91              |                       |   |
| • 397                 | DAC Software . . . . . CIII                     | • 293                 | Mix Software . . . . . 41                 |                       |   |
| 282                   | DFW Computer Center . . . . . 45                | • 411                 | Montezuma Micro . . . . . 24              |                       |   |
| 382                   | Discount Electronics . . . . . 99               | • 416                 | Montezuma Micro . . . . . 110, 111        |                       |   |
| • 204                 | DiskCount Data . . . . . 2, 3                   | • 424                 | Montezuma Micro . . . . . 83              |                       |   |
| 294                   | Dorsett Educational Systems . . . . . 123       | • 524                 | Montezuma Micro . . . . . 25              |                       |   |
| • 91                  | Dotwriter (Prosoft) . . . . . 7                 | 281                   | Nibble Notch . . . . . 145                |                       |   |
| • 452                 | Drasselhaus Computer . . . . . 67               | • 232                 | Nocona Electronics . . . . . 107          |                       |   |
| • 85                  | Educational Micro Systems . . . . . 18          | • 414                 | PBJ, Inc. . . . . 26                      |                       |   |
|                       | <i>80 Micro</i>                                 | 492                   | PCA Technologies . . . . . 46             |                       |   |
| 549                   | Classified Ads . . . . . 151                    | • 470                 | PG Design Electronics . . . . . 89, 118   |                       |   |
|                       | Load 80 Subscription . . . . . 96, 97           | • 124                 | Perry Computers . . . . . 133             |                       |   |
|                       | Load 80 Back Issues . . . . . 74                | 437                   | Portable Software . . . . . 67            |                       |   |
|                       | Load 80 Subroutines . . . . . 64                | • 108                 | Powersoft . . . . . 21                    |                       |   |
|                       | Pop Quiz . . . . . 94, 95                       | • 308                 | Powersoft . . . . . 4                     |                       |   |
|                       | Subscription . . . . . 32                       | • 449                 | Professor Jones/Frogg House . . . . . 116 |                       |   |

For further information from our advertisers, please use the Reader Service card. \*This advertiser prefers to be contacted directly.

Advertising Sales (603) 924-7138  
or (800) 441-4403  
West Coast Sales (415) 328-3470

# READER SERVICE

This card valid until October 31, 1986.

- A. How would you describe your interest in MS-DOS, IBM Compatible Systems?  
 1.  I own an MS-DOS, IBM compatible system. 3.  I'm interested but have no immediate plans to purchase.  
 2.  I intend to purchase. 4.  Not interested.
- B. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in seeing the following types of programs published in 80 Micro:  
 \_\_\_ 1. Business applications \_\_\_ 4. Money management applications  
 \_\_\_ 2. Science/math applications \_\_\_ 5. Games  
 \_\_\_ 3. Home management applications \_\_\_ 6. Programming Utilities
- C. *Excluding yourself*, how many people read your copy of 80 Micro?  
 1.  One 3.  Three 5.  Five or more  
 2.  Two 4.  Four
- D. What type of TRS-80/Tandy Computer do you own? Check all that apply.  
 1.  Model I 6.  Model 16/16B/6000 11.  Model 2000  
 2.  Model III/12 7.  Model 100/200 12.  Model 3000  
 3.  Model III 8.  Model 600 13.  Color Computer  
 4.  Model 4/4P/4D 9.  Model 1000 14.  Pocket Computer  
 5.  Model 4D 10.  Model 1200
- E. How long have you owned your TRS-80/Tandy Computer?  
 1.  Less than 1 year 4.  3-4 years  
 2.  1-2 years 5.  More than 4 years  
 3.  2-3 years
- F. Do you subscribe to an information utility, such as CompuServe, Dow Jones News Retrieval, etc.?  
 1.  Yes 2.  No 3.  Not now, but intend to within 12 months.
- G. Do you plan to purchase another TRS-80/Tandy Computer during the next 12 months?  
 1.  Yes 2.  No 3.  Don't know
- H. Where do you use your TRS-80/Tandy Computer? Check all that apply.  
 1.  At home for pleasure 4.  At school  
 2.  At home for business 5.  For math/science applications in any location  
 3.  At work
- I. The articles in 80 Micro are:  
 1.  Too simple 2.  Too complex 3.  Just right
- J. How many purchases have you made based on an ad you saw in 80 Micro?  
 1.  0 2.  1-3 3.  4 or more
- K. Which of the following columns do you read? Please rate them on a scale of 1 (seldom read) to 5 (always read).  
 \_\_\_ 1. Side Tracks \_\_\_ 5. The Next Step \_\_\_ 9. Reviews  
 \_\_\_ 2. Feedback Loop \_\_\_ 6. Dave's MS-DOS Column \_\_\_ 10. New Products  
 \_\_\_ 3. Pulse Train \_\_\_ 7. Fine Lines \_\_\_ 11. Hot CoCo  
 \_\_\_ 4. The Art of Programming \_\_\_ 8. Reader Forum
- L. If you are not a subscriber, please circle 500.
- M. If you would like a one year subscription to 80 Micro, please circle 501 on the Reader Service Card. Each subscription costs \$24.97. (Canada & Mexico \$27.97, Foreign Surface \$44.97, one year only). Please allow 10-12 weeks for delivery.

Reader Service: To receive more information from any of the advertisers in this issue, circle the number of the Reader Service Card that corresponds with the Reader Service number on the ad in which you are interested. You will find numbers. Complete the entire card, stamp and drop into a mailbox. In 4-6 weeks you will hear from the advertiser directly.

|                     |                     |                     |                     |
|---------------------|---------------------|---------------------|---------------------|
| 1 6 11 16 21        | 151 156 161 166 171 | 301 306 311 316 321 | 451 456 461 466 471 |
| 2 7 12 17 22        | 152 157 162 167 172 | 302 307 312 317 322 | 452 457 462 467 472 |
| 3 8 13 18 23        | 153 158 163 168 173 | 303 308 313 318 323 | 453 458 463 468 473 |
| 4 9 14 19 24        | 154 159 164 169 174 | 304 309 314 319 324 | 454 459 464 469 474 |
| 5 10 15 20 25       | 155 160 165 170 175 | 305 310 315 320 325 | 455 460 465 470 475 |
| 26 31 36 41 46      | 176 181 186 191 196 | 326 331 336 341 346 | 476 481 486 491 496 |
| 27 32 37 42 47      | 177 182 187 192 197 | 327 332 337 342 347 | 477 482 487 492 497 |
| 28 33 38 43 48      | 178 183 188 193 198 | 328 333 338 343 348 | 478 483 488 493 498 |
| 29 34 39 44 49      | 179 184 189 194 199 | 329 334 339 344 349 | 479 484 489 494 499 |
| 30 35 40 45 50      | 180 185 190 195 200 | 330 335 340 345 350 | 480 485 490 495 500 |
| 51 56 61 66 71      | 201 206 211 216 221 | 351 356 361 366 371 | 501 506 511 516 521 |
| 52 57 62 67 72      | 202 207 212 217 222 | 352 357 362 367 372 | 502 507 512 517 522 |
| 53 58 63 68 73      | 203 208 213 218 223 | 353 358 363 368 373 | 503 508 513 518 523 |
| 54 59 64 69 74      | 204 209 214 219 224 | 354 359 364 369 374 | 504 509 514 519 524 |
| 55 60 65 70 75      | 205 210 215 220 225 | 355 360 365 370 375 | 505 510 515 520 525 |
| 76 81 86 91 96      | 226 231 236 241 246 | 376 381 386 391 396 | 526 531 536 541 546 |
| 77 82 87 92 97      | 227 232 237 242 247 | 377 382 387 392 397 | 527 532 537 542 547 |
| 78 83 88 93 98      | 228 233 238 243 248 | 378 383 388 393 398 | 528 533 538 543 548 |
| 79 84 89 94 99      | 229 234 239 244 249 | 379 384 389 394 399 | 529 534 539 544 549 |
| 80 85 90 95 100     | 230 235 240 245 250 | 380 385 390 395 400 | 530 535 540 545 550 |
| 101 106 111 116 121 | 251 256 261 266 271 | 401 406 411 416 421 | 551 556 561 566 571 |
| 102 107 112 117 122 | 252 257 262 267 272 | 402 407 412 417 422 | 552 557 562 567 572 |
| 103 108 113 118 123 | 253 258 263 268 273 | 403 408 413 418 423 | 553 558 563 568 573 |
| 104 109 114 119 124 | 254 259 264 269 274 | 404 409 414 419 424 | 554 559 564 569 574 |
| 105 110 115 120 125 | 255 260 265 270 275 | 405 410 415 420 425 | 555 560 565 570 575 |
| 126 131 136 141 146 | 276 281 286 291 296 | 426 431 436 441 446 | 576 581 586 591 596 |
| 127 132 137 142 147 | 277 282 287 292 297 | 427 432 437 442 447 | 577 582 587 592 597 |
| 128 133 138 143 148 | 278 283 288 293 298 | 428 433 438 443 448 | 578 583 588 593 598 |
| 129 134 139 144 149 | 279 284 289 294 299 | 429 434 439 444 449 | 579 584 589 594 599 |
| 130 135 140 145 150 | 280 285 290 295 300 | 430 435 440 445 450 | 580 585 590 595 600 |

Name \_\_\_\_\_ Title \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Telephone ( ) \_\_\_\_\_

**80micro • September 1986 9**

# READER SERVICE

This card valid until October 31, 1986.

- A. How would you describe your interest in MS-DOS, IBM Compatible Systems?  
 1.  I own an MS-DOS, IBM compatible system. 3.  I'm interested but have no immediate plans to purchase.  
 2.  I intend to purchase. 4.  Not interested.
- B. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in seeing the following types of programs published in 80 Micro:  
 \_\_\_ 1. Business applications \_\_\_ 4. Money management applications  
 \_\_\_ 2. Science/math applications \_\_\_ 5. Games  
 \_\_\_ 3. Home management applications \_\_\_ 6. Programming Utilities
- C. *Excluding yourself*, how many people read your copy of 80 Micro?  
 1.  One 3.  Three 5.  Five or more  
 2.  Two 4.  Four
- D. What type of TRS-80/Tandy Computer do you own? Check all that apply.  
 1.  Model I 6.  Model 16/16B/6000 11.  Model 2000  
 2.  Model III/12 7.  Model 100/200 12.  Model 3000  
 3.  Model III 8.  Model 600 13.  Color Computer  
 4.  Model 4/4P/4D 9.  Model 1000 14.  Pocket Computer  
 5.  Model 4D 10.  Model 1200
- E. How long have you owned your TRS-80/Tandy Computer?  
 1.  Less than 1 year 4.  3-4 years  
 2.  1-2 years 5.  More than 4 years  
 3.  2-3 years
- F. Do you subscribe to an information utility, such as CompuServe, Dow Jones News Retrieval, etc.?  
 1.  Yes 2.  No 3.  Not now, but intend to within 12 months.
- G. Do you plan to purchase another TRS-80/Tandy Computer during the next 12 months?  
 1.  Yes 2.  No 3.  Don't know
- H. Where do you use your TRS-80/Tandy Computer? Check all that apply.  
 1.  At home for pleasure 4.  At school  
 2.  At home for business 5.  For math/science applications in any location  
 3.  At work
- I. The articles in 80 Micro are:  
 1.  Too simple 2.  Too complex 3.  Just right
- J. How many purchases have you made based on an ad you saw in 80 Micro?  
 1.  0 2.  1-3 3.  4 or more
- K. Which of the following columns do you read? Please rate them on a scale of 1 (seldom read) to 5 (always read).  
 \_\_\_ 1. Side Tracks \_\_\_ 5. The Next Step \_\_\_ 9. Reviews  
 \_\_\_ 2. Feedback Loop \_\_\_ 6. Dave's MS-DOS Column \_\_\_ 10. New Products  
 \_\_\_ 3. Pulse Train \_\_\_ 7. Fine Lines \_\_\_ 11. Hot CoCo  
 \_\_\_ 4. The Art of Programming \_\_\_ 8. Reader Forum
- L. If you are not a subscriber, please circle 500.
- M. If you would like a one year subscription to 80 Micro, please circle 501 on the Reader Service Card. Each subscription costs \$24.97. (Canada & Mexico \$27.97, Foreign Surface \$44.97, one year only). Please allow 10-12 weeks for delivery.

Reader Service: To receive more information from any of the advertisers in this issue, circle the number of the Reader Service Card that corresponds with the Reader Service number on the ad in which you are interested. You will find numbers. Complete the entire card, stamp and drop into a mailbox. In 4-6 weeks you will hear from the advertiser directly.

|                     |                     |                     |                     |
|---------------------|---------------------|---------------------|---------------------|
| 1 6 11 16 21        | 151 156 161 166 171 | 301 306 311 316 321 | 451 456 461 466 471 |
| 2 7 12 17 22        | 152 157 162 167 172 | 302 307 312 317 322 | 452 457 462 467 472 |
| 3 8 13 18 23        | 153 158 163 168 173 | 303 308 313 318 323 | 453 458 463 468 473 |
| 4 9 14 19 24        | 154 159 164 169 174 | 304 309 314 319 324 | 454 459 464 469 474 |
| 5 10 15 20 25       | 155 160 165 170 175 | 305 310 315 320 325 | 455 460 465 470 475 |
| 26 31 36 41 46      | 176 181 186 191 196 | 326 331 336 341 346 | 476 481 486 491 496 |
| 27 32 37 42 47      | 177 182 187 192 197 | 327 332 337 342 347 | 477 482 487 492 497 |
| 28 33 38 43 48      | 178 183 188 193 198 | 328 333 338 343 348 | 478 483 488 493 498 |
| 29 34 39 44 49      | 179 184 189 194 199 | 329 334 339 344 349 | 479 484 489 494 499 |
| 30 35 40 45 50      | 180 185 190 195 200 | 330 335 340 345 350 | 480 485 490 495 500 |
| 51 56 61 66 71      | 201 206 211 216 221 | 351 356 361 366 371 | 501 506 511 516 521 |
| 52 57 62 67 72      | 202 207 212 217 222 | 352 357 362 367 372 | 502 507 512 517 522 |
| 53 58 63 68 73      | 203 208 213 218 223 | 353 358 363 368 373 | 503 508 513 518 523 |
| 54 59 64 69 74      | 204 209 214 219 224 | 354 359 364 369 374 | 504 509 514 519 524 |
| 55 60 65 70 75      | 205 210 215 220 225 | 355 360 365 370 375 | 505 510 515 520 525 |
| 76 81 86 91 96      | 226 231 236 241 246 | 376 381 386 391 396 | 526 531 536 541 546 |
| 77 82 87 92 97      | 227 232 237 242 247 | 377 382 387 392 397 | 527 532 537 542 547 |
| 78 83 88 93 98      | 228 233 238 243 248 | 378 383 388 393 398 | 528 533 538 543 548 |
| 79 84 89 94 99      | 229 234 239 244 249 | 379 384 389 394 399 | 529 534 539 544 549 |
| 80 85 90 95 100     | 230 235 240 245 250 | 380 385 390 395 400 | 530 535 540 545 550 |
| 101 106 111 116 121 | 251 256 261 266 271 | 401 406 411 416 421 | 551 556 561 566 571 |
| 102 107 112 117 122 | 252 257 262 267 272 | 402 407 412 417 422 | 552 557 562 567 572 |
| 103 108 113 118 123 | 253 258 263 268 273 | 403 408 413 418 423 | 553 558 563 568 573 |
| 104 109 114 119 124 | 254 259 264 269 274 | 404 409 414 419 424 | 554 559 564 569 574 |
| 105 110 115 120 125 | 255 260 265 270 275 | 405 410 415 420 425 | 555 560 565 570 575 |
| 126 131 136 141 146 | 276 281 286 291 296 | 426 431 436 441 446 | 576 581 586 591 596 |
| 127 132 137 142 147 | 277 282 287 292 297 | 427 432 437 442 447 | 577 582 587 592 597 |
| 128 133 138 143 148 | 278 283 288 293 298 | 428 433 438 443 448 | 578 583 588 593 598 |
| 129 134 139 144 149 | 279 284 289 294 299 | 429 434 439 444 449 | 579 584 589 594 599 |
| 130 135 140 145 150 | 280 285 290 295 300 | 430 435 440 445 450 | 580 585 590 595 600 |

Name \_\_\_\_\_ Title \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Telephone ( ) \_\_\_\_\_

**80micro • September 1986 9**

PLACE  
STAMP  
HERE

**80 Micro**  
**P.O. Box 306**  
**Dalton, MA 01227**

PLACE  
STAMP  
HERE

**80 Micro**  
**P.O. Box 306**  
**Dalton, MA 01227**

Continued from p. 33

ify the drive and file to use. The drive remains a default throughout the program (except when using the sort program), but the file name will not. You must type it each time. If you press the return key instead, the most recently used file name appears on screen, but you must retype the name to accept it.

When you open a new file, you are permitted to specify the length of a "reference" field, up to 88 characters. This reference field can hold any extra data on a person. The other fields include two lines for an address (you could use one for company name), city, state (two characters), zip code (10 characters), and phone number.

From the add screen you can see one record at a time, with find and change functions available. The editing ranges from crude to nonexistent. Probably in an effort to be compatible with as many computers as possible, the authors decided not to use the standard arrow keypad and the insert or delete key. In the reference field, control-S, -D, -T, and -V go left and right, delete, and insert, respectively. The insert function does not stay toggled. You must press control-V as many times as necessary.

When adding records, data from the previous record can be brought forward. This is useful and well done. If you press control-G on the first line of a blank record, all the fields from the previous record are brought forward.

The Find option from this same menu choice does an in-string search on any field. This means that you can specify the search characters and NAD will find them even if they do not occur as the first characters in the field.

### File Manipulation

NAD has some nice file-handling features. You can merge two files or select from one file to create another. Either operation is simple, but again I wished for a disk directory from within NAD. As part of the file manipulation, you can change the length of the reference field—a handy feature.

When manipulating files, you can work with the whole file or select a portion of it. The selection is complete, letting you search a range of values or match a specific value. It is also possible to do a not-match or -range search—an important feature sometimes missing from data-base programs. With this function, you search for everything that does not match the criteria.

You do not have to search the entire data base. You can specify a starting and ending record number. This becomes important as the file grows. For example, it took two minutes to search a 1,487-record file to the end. If you know the

record you want is somewhere near the end, you could specify 1,200 as the starting record number and reduce the search time considerably.

NAD does not keep an index, which means that you must sort the file each time you add records or make changes. You can sort on any field. The sort creates a new file, so disk space equal to the present size of the file must be available, although it can be on a different drive from the source file.

The sort worked well enough when my file size was small. However, when I took the file up to nearly 1,500 records, I was unable to obtain a sort. No error messages appeared and everything seemed to be working, but at the end of the sorting process, the output file was not on the disk.

The NAD system automatically saves your work when you've added or changed a certain number of records. You select the number of changes needed before the auto-save occurs or disable it entirely. This is a good safeguard against catastrophes.

### Reports and Labels

A screen-report function displays records meeting the selection criterion, one screen at a time. It is a good way to browse through the data base.

The printed-report function needs 132 columns. If your printer does not have a wide carriage, you can give NAD the codes for condensed print. The report is a fixed, two-lines-per-name format.

The labels generator is flexible. You can print up to six labels across and up to 99 labels per name. You can include part of the reference field at the top or bottom of each label, and you can specify which part to print. You can skip labels entirely and print directly on envelopes; the program pauses between each one.

### Conclusion

The Name and Address System has quality features, such as the precise in-string search, carry-forward of previous records in add mode, file selection and merging, and sophisticated label options.

However, NAD has disturbing omissions: File capacity is unknown; it has no last-name field; editing requires re-typing the data in all fields except reference; and finding a particular name is time-consuming. For \$29.95, it seems that you can't go wrong. You can always get another program if this one doesn't work out. But this logic ignores the importance of the time needed to learn a program and enter data. NAD has no standard ASCII file import or export utility. While a programmer could probably move the data to another program for you, it makes a lot more sense to get the right program in the first place. ■

## 3.5" DRIVE FOR YOUR TANDY 1000

**Compatible with many computers** using 3.5" drive including: IBM Convertible, DG/One, Kaypro 2000, Toshiba T1100, HP110 & 150, Atari 520ST, and Tandy 600.

Manzana's line of 3.5" external and internal disk drive systems come with 3FIVE™. This sophisticated but easy to use software package allows your Tandy 1000 to read & write to a full 720K in many 3.5" formats and is compatible with all MS-DOS 2.X, 3.X.

Upgrade your Tandy to 3.5" technology—the new standard in disk storage.



**MANZANA...the industry pioneer in 3.5" peripherals.** For more information, contact your dealer or call direct. In Canada, please contact Quay Computer Corporation at 416-629-1570.



**MANZANA**

Microsystems, Inc.

P.O. BOX 2117  
GOLETA, CA 93118  
(805) 968-1387

## Software Spare Parts

★★★★

**Software Spare Parts, C Language Routines and Utilities**, by Kent Porter, 236 pp. paperback. Plume-New American Library, 1633 Broadway, New York, NY 10019. \$19.95.

*Software Spare Parts, C Language Routines and Utilities* is a help to anyone using C or trying to learn how to program in it. The book contains 140 sub-programs (or functions, as they are called in C) that you can use as is or modify to suit your purposes.

The book has eight chapters. The first two chapters include routines for string handling, file sorting, and data formatting. They show you how to handle conversions from integer to binary and hexadecimal (hex) to binary (and vice versa).

Chapters 3 and 4 are devoted to interfacing with the MS-DOS world. You are shown some standard ANSI.SYS control codes for performing Basic-like functions, such as clearing and setting the screen, changing screen colors, and reassigning function and text keys. These chapters also include enhanced functions that automatically center text on a 40- or 80-column screen, set the cursor to a particular row and column, and draw boxes anywhere on screen.

BIOS (Basic input/output system) calls and DOS functions are also handled in depth and allow you to change the size and shape of the cursor, scroll text windows up and down, draw circles and lines, set points, and much more. You can find the DOS version number; make, remove, and change subdirectories; and receive disk information about free space and parameters.

Chapters 5 and 6 delve into math and geometric functions, including quadratic and linear equations, matrices, tangents, cotangents, and hyperbolic sines. If financial applications are your bent, then Chapter 7 has functions for loan analysis, computing present and future money's worth, and so on.

The last chapter contains a set of utilities that make any programmer's life easier. It provides utilities to set the function keys, create perpetual calendars, dump a file in hex notation, and create three-dimensional bar graphs.

*Software Spare Parts* lives up to its name. It's a collection of functions that you can call on when you need a specific tool. But if you don't know how to use a hyperbolic cosecant, for example, don't expect this book to show you. It assumes that you know how to use these functions. While *Software Spare Parts*

doesn't show you how to program, it provides good programming examples. It will save you a lot of development time.

—Tim Heagarty

## Lap Coder

★★★

**Lap Coder** runs on the Models 100/200 (16K) and requires a tape recorder. Mu-Psi Computer Consulting, 10 Turquoise St., Suite 250, San Diego, CA 92109, 619-488-2356. \$27.95.

Lap Coder is a Model 100/200 utility that compresses text by as much as 50 percent, so you can store more on cassette. Lap Coder replaces words in text files with a tightly packed code, using less memory. It's a small, 525-byte machine-language program that compresses text at about 3,400 characters per second. While Lap Coder does a good job at compressing text, it could have been better designed for easier use.

You can execute Lap Coder as a machine-language (CO) program or through a Basic (BA) program. While the former would not work on my original version, it does work in the latest version.

You first must load a 3,300-byte Basic program containing all the information needed to create the machine-language Lap Coder program. The loader POKES Lap Coder in memory and then maximizes free memory by removing itself from the machine.

After answering a series of questions regarding relocating and how you want the program set up, a one-line Basic program takes the place of the loader and calls the machine-language portion of the program.

To run the program, you place the main-menu cursor over LAPCOD.BA and press the enter key. An instruction line appears at the top of the display, followed by a list of all document files. You move the arrow keys to select a text file and press the enter key to either code or decode the text file, depending on the file extension. Press the escape key to return to the main menu or K to kill a selected file.

Once a program is coded, it takes the extension DP. Although you can still see the text file in this new format, you can't save or load it to cassette. For this purpose, pressing the space bar switches the extension between DO and DP.

If you compress a file that has already been compressed, the file increases in length by about 25 percent. There aren't any safeguards or prompts in the program to prevent you from doing this. To undo the mess, you have to decompress the program twice.

If you are familiar with how your Model 100 saves files and with elementary machine language, Lap Coder will

help reduce the size of your files. You can gain up to one-third more space using it. In a limited machine such as the Model 100, you need all the memory or space that you can find.

—Paul J. Perry

## The Visible Computer: 8088

★★★★

**The Visible Computer: 8088** runs on the Model 1000/1200/3000 (256K) and requires one disk drive. Software Masters, P.O. Box 3638, Bryan, TX 77805, 409-822-9490. \$49.95 copy-protected version; \$79.95 unprotected version.

The Visible Computer: 8088 (Assembly-Language Learning System) is a teaching system consisting of a 357-page book and an 8088 simulator/debugger software package. The simulator/debugger is used throughout the course to test the various example programs.

The book is easy to read. A novice Assembly-language programmer with experience in Basic will find the Assembly-language fundamentals presented in a clear and concise manner.

The first few chapters cover fundamentals, such as machine/Assembly language, alternative numbering systems, digital logic, and 8088 architecture. Chapter 5 takes a little side trip with a brief tutorial on the simulator and debugger. Chapter 6 discusses the segmented architecture of the 8088 and perhaps should have been placed before Chapter 5. Chapters 7 and 8 again discuss the simulator/debugger. It is not until Chapter 9 that any programming is done.

The debugger has many features found in DOS's Debug. For example, you can display or enter data, specify a range of addresses to be displayed, fill a range of addresses with a user-defined value, and so on. Two of its interesting features are a built-in calculator and a privileged mode in which to operate the simulator.

The four-function calculator allows you to specify the operands in hex, binary, or decimal. This feature should be standard in every debugger.

The privileged mode is also a feature not found in many debuggers. When the privileged mode is toggled off, you can write only to user memory and cannot execute certain debugger or simulator commands.

The simulator/debugger is far more interesting than the book. While there are better books available on Assembly-language programming, few debuggers offer the features found in the Visible Computer's debugging package.

—Gary Shade

# SOFTWARE FOR TRS-80™ MODELS 1, 3, and 4 COMPUTERS

Circle 175 on Reader Service card.

## TYPITALL Word Processor \$129.95 TYPITALL with Spelling Checker \$179.95

Word Processor upwardly compatible with SCRIPSIT — it reads your old SCRIPSIT files and uses the formatting and cursor movement commands you are already familiar with. But it is a completely new word processor with so many advanced features that we can't even mention all of them here.

Send **any** control or graphic/special character to the printer. Control/graphic characters included **In the text** so that you have complete control of all features of your printer. Print the formatted text **on the screen** before going to the printer. Send formatted text to a **disk file** for later printing. **Merge** data from a file during printing. Names, addresses, and other text can be inserted during printing. No need for a separate program for "mail merge" capabilities. Print while editing (spooling). Assign **any sequence of keystrokes** to a **single** control key. Call up to 16 **help screens** at any time. **Move cursor** forwards or backwards by character, word, line, or page. **Reenter** the program with **all text intact** if you accidentally exit without saving the text. Optional spelling checker comes with 29,500 word dictionary. Verify a 3,500 word document in **less than two minutes**. True Model 4 (80 x 24 display, TRSDOS 6) and Model I/III versions.

## SYSTEM DIAGNOSTIC \$99.95

Is your computer working correctly? **Are you sure?** System Diagnostic has complete tests for every component of your TRS-80 Model 1, 3, or 4 (separate versions for each model).

**ROM:** checksum test. **RAM:** three tests including every location and data value. **Video display:** character generator, video RAM, video signal. **Keyboard:** every key contact tested. **Line printer:** character tests with adjustable platen length. **Cassette recorder:** read, write, verify data. **Disk drives:** disk controller, drive select, track seek, read sectors, formatting, read/write/verify data with or without erasing, disk drive timer, disk head cleaner. Single or double density, 1-99 tracks. **RS-232-C Interface:** connector fault, data transmission, framing, data loop, baud rate generator.

## SMART TERMINAL \$74.95

The **Intelligent** telecommunications program for your TRS-80 Model 1, 3, or 4, or Model 2 CP/M. **Memory buffer** for sending and receiving files. **Automatic transmission** of outgoing data. **Automatic storage** of incoming data. **Character translations**. True BREAK key. Help screens, line feed filters, echo and line printer toggle switches, and more.

## MONITOR #5 \$22.95

A comprehensive machine language monitor and debugging program. **Display** memory in ASCII or hexadecimal format. **Disassemble** memory to show machine language commands. **Move and compare** blocks. **Search** and **modify** memory. **Relocate** machine language programs. Read and write **cassette tapes** (Models I/III only). **Unload** programs in low RAM on disk. **Print** optionally on video display or line printer. **Save and load** disk files. **Input and output of disk sectors**, bypassing disk operating system. **Complete debugging package**, including setting and displaying registers, single stepping through machine language instructions, setting breakpoints, and executing machine language programs under command of the monitor.

## HOWE SOFTWARE

64 Windmill Road  
Armonk, New York 10504

Information and same day orders:

**(914) 273 - 3998**

**30-day Money Back Guarantee!**

**When ordering, please give your computer model number.**

®TRS-80 is a trademark of Tandy Corp.

# SOFTWARE FOR ALL TANDY and TRS-80™ COMPUTERS EXCEPT COLOR COMPUTER AND PORTABLES

## SMALL BUSINESS ACCOUNTING with PAYROLL \$99.95

This program is based on the **Dome Bookkeeping Record #612** and handles **bookkeeping** and **payroll** for a small business. Bookkeeper provides single entry ledgers with category breakdowns for both income and expenses. Monthly, through last month, and year-to-date summaries. Fiscal year can start with any month.

Payroll handles up to 99 employees with **automatic computation** of F.I.C.A. and federal income tax. State tax and three optional deductions also included. Prints both payroll and expense checks on same forms. Monthly, quarterly, and yearly summaries as well as automatic computation of Form 941 reports and W-2 forms. Simple and easy to learn — ideal for first-time computer users.

## SMALL BUSINESS MANAGEMENT SYSTEM \$299.95

A complete **point-of-sale** program for a small business. Handles **order entry, invoicing, inventory, and bookkeeping**, including general ledger, accounts receivable, and accounts payable.

**Order desk** handles order entry and invoicing. Items ordered are automatically deducted from inventory, accounts receivable updated. Includes up to 999 8-character part numbers (1,999 for MS-DOS). Handles both customer accounts and single orders. Invoices printed on forms or plain paper and include discounts, sales taxes, and shipping and handling charges.

**Bookkeeper** keeps general ledger, accounts receivable and payable, produces customer statements. General ledger produces monthly and year-to-date totals. Receivables tracked to invoices, automatically updated as income entered.

**Inventory** produces sales and inventory reports showing items in stock, amounts sold, monthly rates of sale, and profits.

**Installation** tailors program to your business.

## MAILING LIST \$99.95

Build and maintain mailing lists of up to **32,767** names. Up to five-line labels including first and last names, optional second line, address, city, state, zip code, and optional fifth line. Optional lines can be used for telephone numbers, account numbers, or any data, and may be printed at your option. Sort or search names by **any** field. Each name record can be associated with up to 14 different **key groups**. File can be printed by any combination of key groups. Print labels in 1, 2, 3, or 4 adjustable columns, on envelopes or in master index format. Runs on floppies or hard disk, limited only by disk capacity (maximum size list requires over 5 megabytes).

## HOME BUDGET and CHECKBOOK ANALYST \$59.95

A complete checkbook program together with budgeting, income and expense analysis, comparisons, and projections. Enter and print checks, enter deposits, and compute your current checking balance. Program also handles non-check expenses, bank debits, and income. Monthly and year-to-date summaries and yearly projections based on data through a known month. Monthly expenses compared to a pre-established budget.

24-Hour TOLL-FREE Order Number:

Outside California call:

**(800) 428-7825, ext. 169**

Inside California call:

**(800) 428-7824, ext. 169**

Please allow 3-4 weeks for delivery.

Terms: checks, Visa, Master Card, or C.O.D.

Shipping and handling: \$3.00. Canada, Mexico, Hawaii: \$6.00

Air mail overseas: \$17.00. New York residents add sales tax

**PROF JONES**

1940 WEST STATE ST.  
BOISE, IDAHO 83702  
(208) 342-6939

**PROFESSIONAL HANDICAPPING SYSTEMS**

**PROFESSIONAL SERIES**

**PROFESSIONAL SERIES™** (Tho/Grey/Trot)  
The all new Professional Series™ represents the most advanced handicapping software available.



**Analysis Module™**  
Complete bet analysis highlights this basic Professional Series™ module. Full 50 tracks/kennels/etc. \$249.95

**Factor Value/Multiple Regression Module™**  
Factor Value Weighting highlights this addition module™ \$149.95

**Data Base Manager Module™**  
Automatic storage of last 11 races highlights this module. (\$99.95 with Factor Value Module) \$149.95

**GOLD EDITION™** (Tho/Grey/Trot)  
The classic Gold Edition™ from Prof. Jones offers flexibility, results, and ease of use.

|                        |          |
|------------------------|----------|
| Gold Edition™          | \$159.95 |
| Enhanced Gold Edition™ | \$199.95 |
| Limited Gold Edition™  | \$299.95 |
| Ultra Edition™         | \$399.95 |

**Basketball Analysis™** — \$99.95; With win/loss power ratings, \$149.95

**PC-3 Portable Computer (4k)** — Choice of Thoroughbred/Greyhound/Trotter Gold Edition™ software on a hand-held computer. \$249.95

**Model 100 Portable Computer (32k)** — Choice of Thoroughbred/Greyhound/Trotter Gold Edition™ software on a lap-top computer. \$649.95

**Professor Picks Football™** — \$99.95; With win/loss power ratings, \$149.95; Professional Series with "built in" schedules, last four game analysis for entire season, "single entry" setup, expanded results section and more, \$199.95

**Bookie Buster™ Football Analysis** — A 10-year statistical database highlights this analysis. Individual games are evaluated using up to 21 separate criteria with even more room for "user generated" systems. Includes complete data through 1985 season. \$149.95

**Lottery/Lotto Statistical Analysis™**  
— Lottery: 3-4 digits — \$79.95; Lottery/Lotto: max. of 99 digits — \$99.95; Enhanced Lottery/Lotto: with Dimitrov betting systems — \$129.95

**PHS-Link™** — The only Handicapper's bulletin board with Professional Football and Basketball analysis, statistics, and tips from the pros. Call (208) 342-6948 (with modem) between 5 p.m. and 8 a.m. (MST) for pricing and more information.

**Master Handicapper™ Video Instruction Series**  
— Have Prof. Jones himself guide you through all the intricacies of the Professional Series software as well as provide valuable insights into the world of computerized handicapping. Designed to get you up and running fast!  
Tape #1 (Thoroughbred/Greyhound/Trotter) — Analysis Module™ and Bet Analysis™ — \$39.95  
Tape #2 (Thoroughbred/Greyhound/Trotter) — Multiple Regression™ and Data Base Manager™ — \$29.95

Terms: Free shipping all software. Add \$6.00 COD / \$6.00 UPS Blue / \$9.00 Out-of-country / ID residents add 5% / 3 weeks personal checks / cash price only add 2% Visa, MC, AMEX. Prices subject to change.

**FREE CATALOG**

**Failed Expression**

In Hardin Brothers' "Truth AND Consequences" (June 1986, p. 42), the box containing Model I/III modifications (p. 45) has an error in line 40 of the second routine. As Mr. Brothers points out in his article, the expression IF NOT INSTR( ) will always fail. Thus, line 40 fails, and the program will always fall through to the following line. Change it to the following:

```
IF OK THEN 50 ELSE 20
```

(Bruce E. Baker, Jericho, NY)

**Time Out**

In Program Listing 2 of my July 1986 article, "High Time" (p. 65), the last hexadecimal number on line 31 should be 03. The number at the end of line 3 must then be changed from 101245 to 101242, which prevents the hours from being incremented while the chime function is turned off. (Frank Yacucci, Austintown, OH)

**Solver/BAS Solved**

Line 500 of Roxton Baker's Solver/BAS ("Finding Your Roots," February 1986, p. 48) must be modified so the variable U can accept decimal values:

```
500 DEFINT A-Z:DEFSNG A,B,D,Q,W,X,Y,Z,U
```

(A. Goldberg, Chestnut Hill, MA)

**Easy Data Update**

Robert Hood's Ezydata/SRT ("Easydata, Take Two," August 1986, p. 66) adds a sort routine to Easydata/BAS ("Little Wonder," December 1984, p. 73). To sort files you've already created with Easydata/BAS, delete from Ezydata/SRT lines 250, 510, 540-560, 720-740, 1250, and 1270-1290. You must also delete the If...Then...Else statements at the end of lines 750 and 1140 and change lines 530 and 1260 to read:

```
530 INPUT#1,NI
1260 PRINT#1,NI
```

Model 4 users should change the PRINT@ 979 statement in lines 790 and 1190 of Ezydata/SRT to PRINT@ 1780.

To access the sort from Easydata/BAS, add the following lines to Easydata/BAS:

```
305 PRINT TAB(2) "(A) Alphanumeric Sort"
320 YC=INSTR("CRFEDSPQA",YC$)
395 IF YC=9 THEN RUN "EZYDATA/SRT"
```

If you prefer a neater printout and don't need to sort files you've already created with Easydata/BAS, change lines 320, 2040, and 6060 in Easydata/BAS to read:

```
320 YC=INSTR("CRFEDSPQA",YC$)
2040 INPUT#1,NI,W
6060 PRINT#1,NI:W
```

Then add the 12 lines shown in the Figure.

—Eds.

```
86 LUS=LEFT$(TIME$,8)
305 PRINT TAB(2) "(A) Alphanumeric Sort"
395 IF YC=9 THEN 19000
602 J(X)=LEN(A$(X,B)):IF J(X)>W THEN W=J(X)
1135 H(X)=LEN(A$(X,Y)):IF H(X)>J(X) THEN J(X)=H(X)
2035 INPUT#1,LUS$
2045 FOR X=1 TO NI:INPUT#1,J(X):NEXT
6055 PRINT#1,LUS$
6065 FOR X=1 TO NI:PRINT#1,J(X):NEXT
19000 FOR J=1 TO LEN(FL$):IF MID$(FL$,J,1)="/" THEN MID$(FL$,J+1,3)="SRT" ELSE NEXT J
19010 GOSUB 6000
19020 RUN "EZYDATA/SRT"
```

Figure. Changes to Easydata/BAS.

**Macros for All**

Some owners of Microsoft's Series I Editor/Assembler are getting error messages when assembling the utilities in Commando, my customized-macro program published in the February issue ("Macro Economics," p. 66). The problems stem from incompatibilities between Series I and my editor/assembler, MISOSYS's EDAS for the Models I and III.

All Series I source code will assemble on EDAS, but some EDAS code won't assemble on Series I. Here is the necessary code-conversion information:

- You must limit labels to six characters and cannot use special characters like \$ and @.

- Replace pseudo-op codes DB, DW, DL, DM, and DS with DEFB, DEFW, DEFL, DEFM, and DEFS, respectively. The first three can have only one parameter; therefore, you must replace a program line such as:

```
DEFB ODH,84H,0FEH
```

with three lines:

```
DEFB ODH
DEFB 84H
DEFB OFEH
```

and also replace the following:

```
DEFM 'Enter Logical Name:'.3
```

with these two lines:

```
DEFM 'Enter Logical Name:' DEFB 3
```

(Craig Chaiken, Avon, CT)

**Blank Expressions**

My article, "Blank Expressions" (January 1986, p. 76) doesn't work on the Model 4P in Model III mode because of differences in the ROM image that each system uses. To make it work, change line 00420 from LD HL,0043H to LD HL,0292H. This modification causes the program to point to a RET instruction that is present at the same position in both the Model III (and 4) ROMs and the Model 4P ROM image. (John Ratzlaff, Candler, NC)



Circle 301 on Reader Service card.

# WHY PAY MORE...

## When you can own for MUCH LESS!



Enjoy year round Sale prices with credit card convenience or special discount prices for Cash Purchases.

Same day processing for speedy delivery

Special 30 day return policy.

**FULL CATALOG SELECTION**

**Customer Service**  
9 AM  
to  
5 PM  
Texas time



**NEW**  
**MODEL 3000**  
In Stock

# BIG D COMPUTERS

ROANOKE CENTER-ROANOKE, TX 76272

CALL 1-800-FOR BIG D  
(1-800-367-2443)



**Now Hypercross Converts Basic!**

\* TRS80 - CP/M - MS-DOS - CoCo File Transfer \*!

Now you can **CROSS** the barrier between computers! Using **HYPERCROSS** you can **COPY** files between TRS-80 disks and those from many **CP/M** and **IBM-PC** type computers. If you have access to more than one kind of computer, or you are changing to a new machine then you need **HYPERCROSS** to transfer your text files, BASIC, FORTRAN PASCAL or C programs, Visicalc files, general ledger and accounting files, data bases and even binary files. **HYPERCROSS** lets you format alien disks and copy files on your own TRS-80 or MAX-80 without using cables.

**Formats supported:** IBM-PC and MS-DOS compatibles include DOS 1.1, 2.x/3.0 single and double sided and Tandy 2000, CP/M from Aardvark to Zorba, including all popular TRS80 formats such as Holmes, Montezuma, and Omikron. TRS-80 Color Computer format also supported.

**New Feature: Hypercross converts Basic files** Now Hypercross includes a feature to automatically change the tokens in a TRS-80 file to the correct format for CP/M, MSDOS or CoCo. Syntax of the program is not changed.

**PRICES** Inc. disk manual, S/H. All versions include Basic convert.  
 Hypercross CoCo for TRS-80 Color Computer ..... **\$54.95 ppd**  
 Hypercross CP/M with 40 single-sided formats ..... **\$54.95 ppd**  
 Hypercross PC/MS-DOS standard formats ..... **\$54.95 ppd**  
 Hypercross XY/2.0 with 90 CP/M and PC formats ..... **special \$79.95 ppd**  
 Hypercross XT/2.0-Plus. Now with 220+ formats inc. CoCo ..... **\$129.95 ppd**

Upgrade at any time for price difference plus \$5 plus old disk.  
 Please specify **TRS-80 Model I (needs doubler)**, **III**, **4/4P**, or **MAX-80**.

**Amazing HYPERZAP 3.2G Disk Magic!**

Do you want to back up your precious copy of Copycat 3, or SU. Do you want to fix or modify a disk - if so then you need **HYPERZAP!** On the market for 3 years, **HYPERZAP** is more than just another disk copying program - it is the program for analyzing, copying, repairing, creating floppy disks of all kinds. It works with TRS-80 formats as well as many others such as CP/M, PC, CoCo etc. Designed to handle mixed density sectors on any track in any sequence. Many features for reading, writing, editing track and sector data. **Hyperzap** is the tool that lets you be in charge. **Make your own self booting disks.** Take your own CMD file and turn it into a dual booting Mod 1/III/IV disk. **Autopilot mode** allows learns, saves and repeats procedures. Disk comes with fascinating examples. Use Hyperzap as a learning tool - find out how things are done!

**HYPERZAP 3.2G** - nothing else even comes close! ..... **\$49.95 ppd**

**Exciting New Programs**

Here is an abbreviated list of some of the new programs we have added to our catalog. Except where noted they are for Model 1, 3 and 4/4P (in 3 mode).

**Hartforth First Class FORTH** for TRS80 1, 3 or 4 versions ..... **\$65.00**  
**Pascal Superb Editor, Compiler and Run-Time** ..... **\$65.00**  
**Enigma Encrypt your files like in World War II** ..... **\$29.95**  
**Driver Compiler Make your own printer drivers** ..... **\$23.95**  
**A.C. Circuit analysis program** ..... **\$49.95**  
**Mysterious Adventure Series 1-10 3 or 4 per disk** ..... **\$29.95**  
**Seawolf, Frenzy, Temple of Bast, Dreamworld games** each **\$16.95**  
**Airbus, Concorde, DC-10, Jumbo Flight Simulators** each **\$24.95**

Still available: **68000 Assembler, TMDD, Zipload and Arranger II.**

**HYPERSOFT**

PO Box 51155, Raleigh, NC 27609  
 (919) 847-4779

Check, COD, Mastercard and Visa Accepted.



**NEW**

**Tandy 1000  
 SPEED  
 UNLIMITED  
 8087**

If you're programming, running spreadsheets or CAD software on your Tandy 1000—fasten your seatbelt!

PG Design has developed an 8087 adapter card, **SPEED TICKET**, for the Tandy 1000 which allows you to dramatically accelerate the running time of your programs. Programmers' tools like MicroWay's **87BASIC™**, spreadsheets like Lotus 1-2-3™, or CAD software like Autodesk's **AutoCAD™** run as much as 500 percent faster when you get yourself a **SPEED TICKET** from PG Design.

Just pop the hood on your Tandy 1000, unplug the 8088 chip, plug it into the **SPEED TICKET**, and plug the **SPEED TICKET** back into the original 8088 socket. Wipe the windshield and you're off.

**SPEED TICKET** comes with test software and our guarantee that it works perfectly, or your money back!

**SPEED TICKET** - \$249

**5MHz V20 Processor** - \$19.95

(boosts performance speed an additional 3-5 percent)

**8087 processor with test software for Tandy 1000A** - \$149.

**PG  
 Design**

We accept Master Card, VISA, money orders, and checks.  
 We ship within five days of receiving your order.

PG Design Electronics, Inc.  
 Dept. B, 37560 Thirty-one Mile Rd,  
 Richmond, MI 48062  
 313/727-2744

**T80-FS1  
 Flight  
 Simulator**



**See your dealer!**

Available for Model I or Model III. \$25.00 on cassette or \$33.50 on disk (with enhancements) All versions require 16K.

If you order direct, please specify whether you have Model I or Model III (the media are different) and whether you want disk or cassette. Include \$1.50 and indicate UPS or first class mail. Illinois residents add 5% sales tax. Visa and Mastercard accepted.

If you don't yet own a disk, don't fret. You can upgrade anytime. Cassette users may send back their cassette (but not the manual) along with \$10 (first class shipping included) and receive the disk version.

**subLOGIC**

Communications Corp.  
 713 Edgebrook Drive  
 Champaign, IL 61820  
 (217) 359-8482  
 Telex: 206995

**JUST IN TIME FOR SUMMER!**  
**GREAT PRICES!**

**CSP**  
Computer Supplies of Peterborough

**CURTIS SURGE PROTECTORS**

|          | LIST    | SALE    |
|----------|---------|---------|
| Diamond  | \$49.95 | \$39.95 |
| Emerald  | \$59.95 | \$49.95 |
| Sapphire | \$79.95 | \$69.95 |
| Ruby     | \$89.95 | \$79.95 |



**FAMOUS BRAND \$ DOLLAR \$ DISKS!**

- Quality Nationally Known Brand 5 1/4" disks
- Reliable, lifetime warranty
- SS/DD only \$1.00 each
- DS/DD only \$1.15 each
- Any quantity

**BULK VALUES**

**GREAT SAVINGS!**

**NEW!**



**Tilt and Swivel Power Center**

**SURGE PROTECTOR NOISE EM/FILTER**

- 15A Circuit Breaker
- 6FT Cord
- 14/3 AWG SJT
- 15A, 125V, 60Hz, 1800W
- Master Power On/Off Switch
- Lighted Rocker Switches Correspond to Five Individual Sockets on Rear Panel
- High Grade Against Fire ABS Construction.
- Can Swivel & Tilt
- 11" x 10" x .75"



**# ONLY 79.95**

**CURTIS SAFE-STRIP**

**Super Value! Priced at only \$19.95**

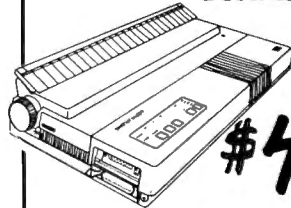
Light \$29.95

Protect Valuable electronic equipment and data files from damage. Surge and spike suppressor and noise combination converts one outlet into six.

**FAN FOLD COMPUTER PAPER**

|                              | LIST    | SALE    |
|------------------------------|---------|---------|
| 20# 1000 Sheets micro-perfed | \$19.95 | \$14.95 |
| 20# 2500 Sheets micro-perfed | \$32.95 | \$26.95 |
| 15# Green bar 3500 Sheets    | \$47.95 | \$37.95 |

**Brother M-1509 Serial Impact Dot Matrix Printer**



**ONLY \$425.00**

List \$550.00

- High speed output (180 cps)
- Near Letter Quality printing
- Variety of printing fonts and functions
- Large buffer memory
- Optional auto cut sheet feeder
- Compatible with IBM PC\* and Epson FX-100+\*
- One inch paper cut function
- Slim, compact, and attractively styled
- Quiet Operation

**LOOK!**

ONLY \$3.00 FOR THESE INFORMATIVE AND EDUCATIONAL BOOKS!

**ONLY \$3.99**

**80 MICRO REVIEW**  
Read Reviews of Software and Hardware.

**LOW-COST COSTING**  
Run Your Business Better with Cost Management Book.

**COLOR COMPUTER BOOKS**  
TRS-80 Color Computer Interfacing  
TRS-80 Model III Color Computer

**BOOKS**  
TRS-80 Interfacing Bk I  
TRS-80 Interfacing Bk II  
Mostly Basic Applications  
Mostly Basic Applications Intermediate Programs for TRS-80  
TRS-80 More Than Basic  
Real Time Control for TRS-80  
Using the Z-80 in the TRS-80  
TRS Assembly Made Simple  
Battlestar Basic for TRS-80

**Protect Your Software FLIP 'N' FILE /15**

Protect Software from dust, debris and moisture. Stores up to 15 5 1/4" diskettes.



List Price \$9.95

**Sale \$7.95**

|                          | LIST    | SALE    |
|--------------------------|---------|---------|
| Teak Roll Tops 5 1/4"-50 | \$32.95 | \$18.95 |
| Teak Roll Tops 3 1/2"-45 | \$23.95 | \$16.95 |
| Teak Rolltop/100         | \$48.95 | \$34.95 |
| Flip 'n' File/50         | \$19.95 | \$14.95 |
| Flip 'n' File/15         | \$ 9.95 | \$ 7.95 |
| Teak Roll Top/100        | \$49.95 | \$39.95 |

**BUY NOW!**

**ORDER TOLL FREE 800-843-6700**

**QUESTIONS? Call 603-924-9261 Ext. 133**  
Hours: M-F 8:00-5:00 EST

\$3.00 Postage & Handling. Quantities Limited. Selection may vary. All sales final. Returns need RMA. Allow 2-6 weeks for delivery.

We reserve the right to substitute similar items.  
MC VISA Money Order



**Night Flight**

Take part in pivotal WWII battle as you take off, land and fly photo recon missions to determine the location of enemy ships (cassette only)

ONLY \$8.57

CALL FOR OTHER SPECIALS!!

**CHECK OUT THESE LOW PRICES ON GREAT TRS-80 PROGRAMS!!!**

All programs guaranteed to run.  
DISK PROGRAMS \$9.97

CASSETTE PROGRAMS \$8.57

**GAMES**

|                            |     |
|----------------------------|-----|
| Sparrow Commander          | d   |
| Kitchen Sink               | d   |
| Space Shuttle              | c   |
| Battle Ground              | c   |
| Mystery Fun Hse            | c   |
| Galactic Empire            | c&d |
| Dragonquest                | c   |
| Temple of the Sun          | c&d |
| Ball Turret Gunner         | c   |
| Alien Attack Force         | c   |
| Cosmic Patrol              | c&d |
| Swamp War                  | c   |
| House of 30 Gables         | c   |
| Domes of Kilgary           | c&d |
| Flying Circus              | d   |
| Master Reversi             | c&d |
| Key Commander              | c   |
| Air Mail Pilot             | c   |
| Geography Explorer: USA    | c&d |
| Geography Explorer: Europe | c&d |
| Savage Island              | d   |

**UTILITIES AND EDUCATION**

|                        |     |
|------------------------|-----|
| Cassette Scope         | c   |
| Terminal -80           | c   |
| Music Master           | c   |
| Programers Converter   | c   |
| Programers Primer      | c   |
| Investors Paradise     | c   |
| Renum Compress         | c   |
| Disassembler           | c   |
| Music Teacher          | c   |
| The Elements           | c   |
| Everyday Russian       | c   |
| Omni Converter         | c   |
| Archimedes' Apprentice | c   |
| Typing Teacher         | c   |
| Elements               | c   |
| Astrology              | c   |
| Santa Paravia          | c   |
| Disk Editor            | d   |
| Teachers Aide          | c&d |

**GEOGRAPHY EXPLORER**  
Essential geographical facts are presented in an entertaining manner with fun features like animated graphic rewards for correct answers.

A real steal at **\$9.97** for disk and only **\$8.57** on cassette!!

**TRS-80 ENCYCLOPEDIAS !!**

Get a \$200.00 value for only \$30.00! Ten volumes at \$3.00 each. You get articles on business, hardware, interfacing as well as utilities and tutorials. Call now and get the entire set while supplies last.

**ANNOTATED BASIC**

Two volumes of basic programming technique. ONLY 3.00 each

**TRS-80 DATA FILES**

DB management with simple basic. 3.00

Prices Change

**DEALER**

Every Day.

**INQUIRIES**

Please Call

1-800-343-8841

**INVITED**

For Lower Prices

# PRICE

## Sizzling Summer Specials Announcing MEGADISK PLUS +

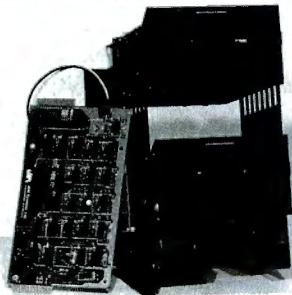
Complete Systems! for the TRS 80 Model I/III/IV/4P, Color Computer, IBM-PC & AT, Max/80  
Software Drivers: LDOS, NEWDOS/80, DOSPLUS, TRSDOS 6.x, CP/M available



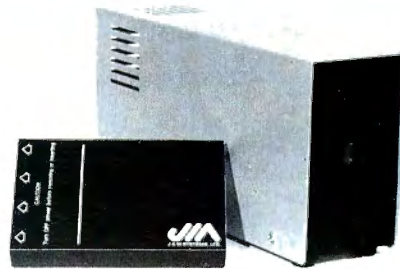
**Drive a 5 to 40 Megabyte Hard Bargain Starting at \$399.95**  
REMOVEABLE CARTRIDGE Systems Now Available!!!

**MEGAPLEX your Megadisk — 2 to 10 Port Systems**  
Prices Start at a LOW \$199.95  
Models III/ IV 4P

Call Toll Free Ordering **1-800-343-8841**



**\$259.95**  
Disk Drive Upgrade Kit for Model III/IV easy to install system—no soldering. Complete with controller, towers, power supply, 1 Half High Disk Drive, cables, and easy to follow instructions. Second Drive **\$89.95**



High Quality Low-cost Price Drive 0, 1, 2, 3 for the Color Computer Starting at **\$189.95**.

**CANADIAN CUSTOMERS PLEASE CALL 514-383-5293**

Software Support Inc. - **MicroSmart Inc.**

TERMS and CONDITIONS: **1-617-872-9090**

All prices are cash discounted. However, we do accept MC, VISA, AMEX & DISCOVER credit cards. C.O.D.'s are accepted—No deposit required. Purchase Orders—Corporate, Government & School P.O.'s are accepted. Please call for details. Shipping Costs are calculated per order. Please call for total. Shipments of all in-stock products are made within 24 hours. Same day service is available upon request — no added cost. Not responsible for typographical errors. Terms and Specifications may change without notice.

**OUR NEW ADDRESS** 200 Homer Street Ashland MA 01721  
**OUR NEW COMPANY!**

Hours: Mon.-Fri. 10 am to 5:30 pm (est) Sat 4:00 pm  
**Toll Free Ordering 1-800-343-8841**  
**Dealer Inquiries Invited**

Service & Returns: It is our policy to repair all service returns within 24-48 hours. Normally same day turn-around is accomplished. It is necessary to have a Return (Material) Authorization to insure speedy service.  
IBM, TAVA, COLUMBIA, 5151, COMPAQ, EAGLE, TRS/80, HEATH/ZENITH are registered trademarks of IBM Corp, Tava Corp, Columbia Computer Corp, Key Tronics Corp, Compaq Corp, Eagle Computer, Tandy Corp, Zenith Corp, respectively.  
1986 Software Support, Inc. All rights reserved.  
1986 MicroSmart, Inc. All rights reserved.

# BREAKTHROUGH

**DEALER  
INQUIRIES  
INVITED**

Prices Change  
Every Day.  
Please Call  
**1-800-343-8841**  
For Lower Prices

## MEGADISK™ HARD DISK DRIVE SYSTEMS

**TOLL FREE ORDERING 1-800-343-8841**

For the **IBM/PC, Tandy 1000, TRS/80 Models I/III/IV/4P, Compaq, Tava, PC Workalikes, Color Computers, Heath/Zenith, Max/80**  
Complete with Hardware, Cables, Software and Quikfit Installation

|  |                      |
|--|----------------------|
| 6 Megabytes Internal Mount IBM/PC .....                  | Starting at \$239.95 |
| 11 Megabytes Internal Mount IBM/Tandy 1000 .....         | starting at 359.95   |
| 22 Megabytes Internal Mount IBM/Tandy 1000 .....         | starting at 469.95   |
| 6 Megabytes External System .....                        | starting at 399.95   |
| 10 Megabytes External System .....                       | starting at 599.95   |
| 20 Megabytes External System .....                       | starting at 749.95   |
| Tape Backup System — Internal or External (IBM/PC) ..... | starting at 449.95   |

**WOW! NEW LOW PRICES**  
Call for unadvertised specials

**DOS Drivers:** IBM/Heath — DOS, 1.0, 2.0, 2.1, 3.0, 3.1 or later  
TRS/80-LDOS, TRSDOS 6.x, Newdos/80, Dosplus, CP/M, COCO DOS, Max/80 LDOS, OS9

**FULLY WARRANTEED — PARTS AND LABOR — CALL TOLL FREE - 1-800-343-8841**

## FLOPPY DISK DRIVES, POWER SUPPLIES AND CABINETS

Our Disk Drives are UL approved — Our Floppy Drive Cabinets and Power Supplies are Underwriters Laboratory Listed and have passed the required Federal Communications Part 15 Section B-EMI/RFI tests.

**Warranty on all disk drives is one full year parts and labor. Warranty on floppy disk drive power supplies is five (5) years. In warranty or out of warranty service is 24 hour turn-around on all disk drives and power supplies.**

### Full Height — Tandem

|                                     |         |
|-------------------------------------|---------|
| 100-1 Single Sided 40 tk Bare ..... | \$99.95 |
| In Case with Power Supply .....     | 139.95  |
| Dual Drives in One Cabinet .....    | 239.95  |
| 100-2 Dual Sided 40 tk Bare .....   | 109.95  |
| In Case with Power Supply .....     | 149.95  |
| Dual Drives in One Cabinet .....    | 259.95  |

### Half High Drives

|                                  |        |
|----------------------------------|--------|
| Single Sided 40 tk Bare .....    | 79.95  |
| In Case with Power Supply .....  | 119.95 |
| Dual Drives in One Cabinet ..... | 209.95 |
| Dual Sided 40 tk Bare .....      | 109.95 |
| In Case with Power Supply .....  | 149.95 |
| Dual Drives in One Cabinet ..... | 259.95 |

### Apple/Franklin Disk Drives

|   |        |
|---|--------|
| 35/40 Track in Case with Cable and Software ..... | 129.95 |
|---|--------|

## COLOR COMPUTER DISK DRIVE SYSTEMS AND ADD IN PRODUCTS

**40 Track Single Head Drive with Case, Power Supply, Cable Controller, Instruction Booklet, Diskettes .....** \$189.95  
**Above with Dual Drives in One Cabinet .....** 269.95

**40 Track Dual Head with Case, Power Supply, Cable Controller, Instruction Booklet, Diskettes .....** 229.95  
**Above with Dual Drives in One Cabinet .....** 329.95

## CALL FOR MODEM SPECIALS

**Modem Special 300/1200..... \$199.95**

**ALL IN-STOCK ITEMS SHIPPED WITHIN 24 HOURS. SAME DAY SHIPPING PROVIDED BY REQUEST WITHOUT ANY EXTRA HANDLING CHARGES.**

## TURBO-M™ PC TURN TO PAGES 136-137

### PRINTERS

|  |                      |
|--|----------------------|
| Dot Matrix   |                      |
| Citizen .....  | \$ Call              |
| Star Micronics — S.G. Series .....                         | starting at \$299.95 |
| Daisy Wheel  |                      |
| Silver Reed 440 80 Column 12 CPX .....                     | 315.95               |
| 550 132 Column 19 CPS .....                                | 439.95               |
| 770 132 Column 36 CPS .....                                | 895.00               |
| Olympia 132 Column 14 CPS WITH Form and Tractor Feed ..... | 399.95               |
| Printer Cables .....                                       | starting at 19.95    |
| Printer Paper — Microperf Edge 1000 Sheets .....           | 16.95                |

### ELECTRICAL

|  |          |
|--|----------|
| Surge Protectors — Line Filters — SL Waber — 6 Outlets with Switch ..... | \$ 39.95 |
| Uninterruptable Power Supplies .....                                     | 399.95   |

### MISCELLANEOUS

|  |              |
|--|--------------|
| Diskettes in 10 Pack .....                   | from \$ 9.95 |
| Two print Switches .....                     | from 99.95   |
| Disk Drive Cables .....                      | from 16.00   |
| Maintenance Cleaning Kits .....              | 12.00        |
| Parallel Printer Buffers 8K .....            | 149.95       |
| Floppy Disk Drive Cables                     |              |
| 1 Drive .....                                | 16.00        |
| 2 Drives .....                               | 18.95        |
| Heath/Zenith 2 Drive Cables — Shielded ..... | 24.95        |

## Software Support Inc.-MicroSmart Inc.

**1-617-872-9090**

### TERMS and CONDITIONS:

All prices are cash discounted. However, we do accept MC, VISA, AMEX & DISCOVER credit cards. C.O.D.'s are accepted. No deposit required. Purchase Orders-Corporate, Government & School P.O.'s are accepted. Please call for details. Shipping Costs are calculated per order. Please call for total. Shipments of all in-stock products are made within 24 hours. Same day service is available upon request — no added cost. Not responsible for typographical errors. Terms and Specifications may change without notice.

**OUR NEW ADDRESS**

**200 Homer Street  
Ashland MA 01721**

**OUR NEW COMPANY!**

Hours: Mon-Fri. 10 am to 5:30 pm (est) Sat 4:00 pm

**Toll Free Ordering 1-800-343-8841**

**Dealer Inquiries Invited**

Service & Returns: It is our policy to repair all service returns within 24-48 hours. Normally same day turn-around is accomplished. It is necessary to have a (Return) (Material) (Authorization) to insure speedy service.

IBM, TAVA, COLUMBIA, 5151, COMPAQ, EAGLE, TRS/80, HEATH/ZENITH are registered trademarks of IBM Corp., Tava Corp., Columbia Computer Corp., Key Tronics Corp., Compaq Corp., Eagle Computer, Tandy Corp., Zenith Corp., respectively.

© 1986 Software Support, Inc. All rights reserved  
© 1986 MicroSmart, Inc. All rights reserved  
TURBO M™ of MicroSmart Inc.

# Quick Menu

by James Rinaldo

CoCo users, as much as anyone else, want to use their computing time efficiently. At the system level, however, the common file and disk manipulation commands—Run, Load, Kill, DSKINI, and so on—take a while to type in, and even longer if you can't remember the code.

I've written a program that puts these commands in an easy-to-use menu so you can work on files using only the arrow and enter keys, plus a handful of letter keys. Now you can spend less time at the directory level and more time with the programs and files themselves.

## Ready to Order

The Table on the next page shows a handy list of the letter keys and their functions. You can clip it from the magazine to serve as a reminder until you memorize the codes.

Type in and run Menu/BAS (see the Program Listing), which will place the simplified disk directory on screen. To perform an operation, move the cursor to the target file and press the appropriate function letter. Then follow the screen directions to complete the operation.

The program can load but not execute machine-language files having the BIN extension, which may overlap Menu/BAS and the string space set aside for the directory.

Also, you can reduce the program so it uses only one disk granule by deleting lines zero to 7 and taking out the remark lines. You might find these first lines unnecessary anyway, since they duplicate the information in the Table.

## Line by Line

The first lines of Menu/BAS produce a direction screen to help you learn the various functions. Pressing H or P gives you a printout of the menu.

Line 10 clears the required memory space, dimensions the strings and numerical areas used by the program, picks off the name and number of free granules from the disk, and starts the process of picking apart the directory. In lines 20 and 30, valid file names are con-

*Program Listing. Menu/BAS.*

```

0 CLS:START OF PROGRAM
1 FORX=LTO16:READA$:PRINT#DV,AS;
:IF(LEN(AS)<32ANDX<16ANDDV=0)ORD
V<>0THENPRINT#DV
2 NEXT:DV=0:RESTORE
3 AS=INKEY$:IFAS=" "THEN3:ELSEIFA
S="P"ORAS="H"THENDV=-2:GOTO1:ELS
E0
4 DATA" THIS PROGRAM DISPLAYS A
MENU","FROM A DISK, AND ALLOWS
YOU TO:","[R]UN, [L]OAD, OR [K]I
LL A FILE,","[C]HANGE A FILE'S N
AME,","[S]WAP THE [D]RIVE VIEWED
","[T]RANSFER A FILE TO OTHER D
ISK,","[N]AME THE DISK OF VIEWIN
G,"
5 DATA"[P]RINTOUT A [H]ARDCOPY O
F IT,","[B]ACKUP AN ENTIRE DISK,
","[I]NITIALIZE A (NEW) DISK,","
OR JUST LOOK AT IT BY USING THE"
,"[S]HIFT[UP] OR [DOWN] ARROWS,
"," TO PERFORM THE FUNCTION, MOV
E","THE CURSOR WITH THE ARROW KE
YS"
6 DATA"NEXT TO THE FILE YOU WANT
"," PRESS [ENTER] TO START"
7 'THIS PROGRAM CAN BE REDUCED T
O ONE GRANULE IF THE PRECEDING
LINES ARE DELETED AND THE REMARK
(') LINES ARE REMOVED. THE ABOV
E LINES CAN BE MADE INTO A SEPAR
ATE PROGRAM WITH A CHANGE AT THE
END OF LINE 3: 10 TO RUN"NEW
10 CLEAR2000:DIMP$(68),G(68):VER
IFYON:CLS:D=PEEK(2394):PRINT"DRI
VE":D=F:FREE(D):DSKID,17,18,NS,N
S:NS=LEFT$(NS,24):PORS=3TOLL:DSK
ISD,17,S,AS,BS:AS=AS+LEFT$(BS,1
7):PORZ=LTO225STEP32:Y=ASC(MID$(
AS,Z,1)):IFY=255THEN40
20 IFY THENP$(R)=MID$(AS,Z,8)+
"+MID$(AS,Z+8,3):G(R)=ASC(MID$(A
S,Z+13,1)):R=R+1
30 NEXTZ,S
40 R=R-1:L=1056:DSKID,17,2,AS,B
S:FORX=0TOR:B=1:Y=G(X)+1
50 IFASC(MID$(AS,Y,1))<69THENB=B
+1:Y=ASC(MID$(AS,Y,1))+1:GOTO50:
ELSEG(X)=B:NEXT:B=0:GOSUB120
60 FORX=34LTO344:POKEX,255:NEXT:
O=0:OS=INKEY$:POKEL,PEEK(L)-Q:Q=
-Q:IFOS=CHR$(91)GOSUB160:ELSEIFO
S=CHR$(95)GOSUB170:ELSEFORX=34LT
O344:IFPEEK(X)=247GOSUB180:ELSEN
EXT
70 IFO RO$=" "THEN60:ELSEIFINSTR
("LRKCT",OS)GOSUB200:ELSEIFINSTR
("SDP",OS)THENPRINT0:PRINT0,"FR
OM"D"TO":INPUTY:GOTO310:ELSEIFO
S="N"THENPRINT0:PRINT0,"NAME I
T?":LINEINPUTAS:IFAS=" "GOSUB110
:ELSEN$=AS:DSKO$D,17,18,AS,NS:GO
SUB110
80 IFINSTR("PH",OS)THENPRINT0,"
PREPARE PRINTER, THEN HIT A KEY"
:EXEC44539:X=PEEK(6HPF22)/2:IFX<
>INT(X)GOSUB150:GOSUB110:GOTO60:
ELSEPRINT0:PRINT0,":INPUT"DATE
":AS:GOTO100
90 IFINSTR("BI",OS)=0THEN60:ELSE
CLS:INPUT"TO DRIVE":AS:IFAS<"0
RAS">3"GOSUB150:GOSUB120:GOTO60:
ELSEIFOS="B"THENBACKUP TOVAL(AS
):ELSEDSKINIVAL(AS)
100 PRINT0-2,TAB(22-LEN(AS)/2)NS
" ON "AS" WITH"FREE":PRINT0-2:
FORX=0TOR:PRINT0-2,USING" %
% %":P$(X):G(X):NEXT:PRIN
T0-2:PRINT0-2:GOSUB110:GOTO60
110 PRINT0,NS:PRINT025,USING"###
FREE":P;:FORX=1024TOL055:POKEX,
PEEK(X)-64:NEXT:RETURN
120 GOSUB110:FORZ=0TOR:Z=X+B+2:IF
G(X)THENPRINTUSING" % %
%":P$(X):G(X):IFZ<29THENPRINT"
";
130 IFG(X)=ANDL>1056+(Z-1)*16TH
ENL=1056+(Z-1)*16:ELSENEXT
140 Q=64:SOUND130,1:POKEL,126:RE
TURN
150 SOUND120,3:RETURN
160 IFR<B+29THEN150:ELSECLS:B=B
+30:GOTO120
170 IFB=0THEN150:ELSECLS:B=B-30:
GOTO120
180 IFPEEK(343)=247THEN0=-16:ELS
EIPPEEK(344)=247THEN0=16:ELSEIFP
EEK(342)=247THEN0=32:ELSEIFPEEK(
341)=247THEN0=-32
190 X=(L+0-1056)/16:IFX<0ORX>290
RX>2 THEN150:ELSEIFG(X+B)=0THEN1
50:ELSEPOKEL,96:L=L+0:GOTO140
200 X=B+(L-1056)/16:IFG(X)=0THEN
150:ELSEAS=P$(X):ES=RIGHT$(AS,LE
N(AS))-INSTR(AS,".") :PRINT0:ONI
NSTR("KCT",OS)GOTO220,240,250
210 IFES="BIN"ANDOS="R"THEN150:EL
SECLS:PRINT"LOAD"CHR$(34)ASCHR$(
34):IFOS="L"ANDES="BIN"THENLOA
DAS:PRINT"TYPE "EXEC" TO RUN":
END:ELSEIFOS="R"THENPRINT"R":LO
ADAS,R :ELSELOADAS
220 PRINT0,"KILL "AS" (Y/N)":I
NPUTKS:IFKS<"Y"GOSUB150:GOTO120
:ELSEKILLAS:P=FREE(D):FORY=X TOR:
P$(Y)=P$(Y+1):G(Y)=G(Y+1):NEXT:
R=R-1:CLS:IFL>1056THENL=L-16
230 GOTO120
240 PRINT0,"CHANGE TO ":LINEIN
PUTBS:IPBS=" "GOSUB150:GOTO110:EL
SE260
250 PRINT0,"TRANSFER TO ":LINE
INPUTBS:IPBS=" "THEPCOPYAS:RUN:EL
SEIFLEFT$(BS,1)="-":THENBS=AS+BS
260 B=LEN(BS):FORY=1TOB:IFINSTR
("./",MID$(BS,Y,1))=0THENNEXT:GOS
UB150:GOTO110:ELSEP$(BS,Y-1):ES=
MID$(BS,Y+1,E-Y):Y=INSTR(E
S,""):IFLEN(P$)>8ORLEN(E$)>43G
OSUB150:GOTO110:ELSEIFLEN(P$)<8T
HENP$(BS,Y)=P$(BS,Y)+STRING$(8,32)
270 IFY THENY$=RIGHT$(ES,1):ES=L
EFT$(ES,Y-1)
280 IFLEN(E$)<3THENE$=LEFT$(E$+"
",3)
290 IFY$=" "THENY$=CHR$(48+D)
300 P$(X)=P$+" "+ES:BS=P$(X)+":
"+S:IFOS="C"THENRENAMEASTOPS(X):
GOTO120:ELSEAS=AS+" "+CHR$(48+D)
:COPYASTOBS:Y=ASC(RIGHT$(BS,1))-
48
310 IFY>-1ANDY<4THENDRIVEY
320 RUN

```

End

verted into usable display format and the starting granule is stored for use in computing the granules used. Lines 40 and 50 perform this operation and display the result on screen along with other introductory information.

Lines 60 and 70 control cursor flash and sense for movement. If no key is pressed, the program loops between these two lines. If shift-arrow is pressed,

the paging routines have priority; that's why they're ahead of the PEEK sensor routine for a depressed arrow key.

Some other key commands are handled in lines 70, 80, and 90. The first part of line 70 controls Run, Load, and Kill, along with the commands for changing a file name (Rename) and transferring a file to another disk (Copy). Since most of these functions have a lot in common, I

Continued on p. 126

## System Requirements

Disk Extended Color Basic

Now! 500 new programs for the Tandy 1000!

# For Your TRS-80 Color Computer

Apple - Atari - Commodore - TRS 80 I, III, 4 & Color - IBM PC Jr. - Tandy 1000

## New Educational Programs for Grades K-12 and Adult Self-Studies

### 32 Programs Now Available on Disk for TRS Color Computers



## Interactive Tutorial Programs for Home or Classroom Use

Over 1000 programs for your selection with 32 now available on disk for the Color Computer and 500 now available for the Tandy 1000.

### "We're Your Educational Software Source"

| Subject               | No. of Programs |
|-----------------------|-----------------|
| Reading Development   | 256 (4 on disk) |
| Reading Comprehension | 48 (4 on disk)  |
| Mathematics           | 128             |
| Algebra               | 16 (16 on disk) |
| History               | 32 (4 on disk)  |
| Spelling              | 16              |
| Government            | 16              |
| Physics               | 16 (4 on disk)  |

### 16 Programs in each of the following:

Children's Tales - Carpentry - Electronics  
Health Services - Office Skills - Statistics  
First Aid/Safety - Economics - Business  
Accounting - Psychology - MUCH MORE!

Send for our free catalog of over 1000 Dorsett educational programs for Atari, TRS 80, Apple, IBM PC Jr., Commodore, Tandy 1000, etc.

Apple II, TRS 80 I, III, & 4, and Commodore 64 computers require respective conversion kits (plug-in board and stereo cassette player), \$99.00. Atari 400/600/800/1200 computers require the Atari cassette recorder and the Dorsett 4001 Educational Master Cartridge, \$9.95. For the IBM PC Jr. a cassette adapter cable and a good cassette recorder are required. The Tandy 1000 requires the Dorsett M1001 speaker/PC board kit, \$69.00, and a standard cassette recorder. A Radio Shack CCR-81 or CCR-82 is recommended.

**CASSETTES:** \$59.90 for an album containing a 16-program course (8 cassettes with 2 programs each); \$8.80 for a 2-program cassette.

**DISKS:** \$14.95 for a one-program disk; \$28.95 for two disks; \$48.95 for four disks. All disks come in a vinyl album.

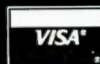
Dealer Inquiries Welcome

### Dorsett Educational Software features:

- Interactive Learning
- User Friendly
- Multiple Choice and Typed
- Program Advance with Correct Response
- Full-time audio narration (Cassette Programs Only)
- Self-Paced Study
- High Resolution Graphics
- Easy Reading Text

For more information, or to order call:

**TOLL FREE 1-800-654-3871**  
**IN OKLAHOMA CALL (405) 288-2301**



**DORSETT**  
Educational Systems, Inc.  
Box 1226, Norman, OK 73070

# From Computer Plus to YOU... PLUS after PLUS after PLUS



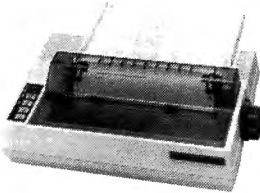
Tandy 200 24K \$649  
Tandy 600 32K \$1269  
Tandy 102 32K \$395



Tandy 3000 \$1969  
Tandy 3000 HD \$2699



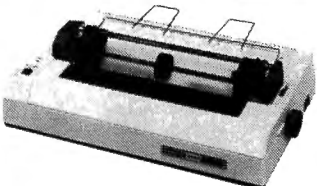
Tandy 1000 \$685  
Tandy 1200 HD \$1599



DMP-130 \$269



Color Computer II  
w/64K Ext. Basic \$145



DMP-105 \$160

## BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

### COMPUTERS

|                             |         |
|-----------------------------|---------|
| Tandy 1000 1 Drive 128K     | 685.00  |
| Tandy 1200 2 Drive 256K     | 1159.00 |
| Tandy 1200 10 Meg. 256K     | 1599.00 |
| Tandy 3000 1 Drive 512K     | 1969.00 |
| Tandy 3000 HD 20 Meg. 512K  | 2699.00 |
| Model IVD 64K with Deskmate | 889.00  |

### PRINTERS

|                                  |        |
|----------------------------------|--------|
| Radio Shack DMP-130 100 CPS      | 269.00 |
| Radio Shack DMP-430 180 CPS      | 559.00 |
| Radio Shack DWP-220 Daisy Wheel  | 359.00 |
| Radio Shack TRP-100 Portable     | 169.00 |
| Silver Reed EXP-500P Daisy Wheel | 229.00 |
| Star NX-10 120 CPS               | 279.00 |
| Star SG-15 120 CPS               | 410.00 |
| Panasonic P-1080 100 CPS         | 229.00 |
| Panasonic P-1091 120 CPS         | 259.00 |
| Panasonic P-1092 180 CPS         | 339.00 |
| Okidata 292 200 CPS              | 529.00 |
| Okidata 192 160 CPS              | 375.00 |
| Epson LX-80 100 CPS              | 275.00 |
| Epson FX-85 160 CPS              | 419.00 |
| Epson HS-80 Portable Ink Jet     | 389.00 |

### Tandy 1000/1200 ACCESSORIES

|                                  |        |
|----------------------------------|--------|
| Tandy 1000 Disk Drive Kit        | 135.00 |
| Tandy 1000 10 Meg. Hard Drive    | 579.00 |
| Hard Drive Controller Board      | 249.00 |
| 256K Memory Plus Expansion Brd.  | 155.00 |
| 512K Ram Board (includes 128K)   | 119.00 |
| PBJ Multi-Function Board (128K)  | 199.00 |
| PBJ Multi-Function Board (256K)  | 209.00 |
| PBJ Multi-Function Board (512K)  | 229.00 |
| 128K Ram Upgrade Kit (NEC)       | 78.00  |
| 256K Ram Upgrade (for PBJ Board) | 69.00  |
| Hayes 1200B Half Card Modem      | 429.00 |
| 1200 Baud Modem Board            | 179.00 |
| Plus RS-232 Serial Board         | 69.00  |
| Digi-Mouse/Clock Board           | 89.00  |

### Tandy 1000/1200 MONITORS

|                                  |        |
|----------------------------------|--------|
| Tandy VM-4 Green Monitor         | 99.00  |
| Tandy CM-10 RGB Color Monitor    | 379.00 |
| Tandy CM-4 RGB Color Monitor     | 249.00 |
| Tandy VM-3 TIL Green Monitor     | 179.00 |
| Tandy 1200 Deluxe Display Adapt. | 299.00 |
| Tandy 1200 Text Monitor Adapt.   | 219.00 |
| Tandy 1200 Dual Display Adapt.   | 210.00 |

### \*\* COMPUTER PLUS SPECIALS \*\*

The PBJ MFB-1000 Multi-Function Board with 512K Ram, DMA, RS-232 Serial Port, Clock Calendar with Battery Backup, and Ram Disk Software .....229.00

The PBJ XRAM Expanded Memory Board with 256K Ram, Upgradable to 2 Megabytes of Additional Memory, EMS Compatible, with Ram Disk Software ..249.00

Tandy 1000 20 Megabyte Internal Hard Drive Kit with Controller, Cables and Mounting Hardware.....559.00

Tandy 1000 20 Megabyte External Hard Drive with Controller, Cables, Case and Power Supply .....649.00

Radio Shack software 10% off. Send for complete catalog. Prices subject to change without notice. Not responsible for typographical errors.

## CALL TOLL FREE 1-800-343-8124

- LOWEST POSSIBLE PRICES
- BEST POSSIBLE WARRANTY
- KNOWLEDGEABLE SALES STAFF
- TIMELY DELIVERY
- SHOPPING CONVENIENCE



# computer plus

P.O. Box 1094  
480 King Street  
Littleton, MA 01460

SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193





DYNACALC

SPREADSHEET  
ANALYSIS

by

**Radio Shack**

# “CANNED SOFTWARE FOR MY COCO?”

## Choose Radio Shack's Dynacalc program— all you add is data.

Want a powerful spreadsheet program for your Color Computer? Then reach for Dynacalc, a high-energy worksheet chocked full of performance features (26-3275, \$99.95). With disk-based, high-performance Dynacalc, your Color Computer system helps keep your figures under control.

## Calculated to please

The Dynacalc recipe keeps your budgetary diet well balanced. Need help in calculating your personal budget, cash management, inventory analysis, income-tax preparation, or any other complicated computational courses? Leave it to Dynacalc. You can get instant answers to “What if . . . ?” questions.

## Quick and easy to prepare

Dynacalc takes the complex planning schemes you have cooking up in your head and lays them out on the table. Why spend all day in the kitchen with a calculator, pencil and eraser when you can get results at the push of a key?

With Dynacalc, you simply add your basic ingredients (numbers, formulas and labels) to a well-organized grid of columns and rows. Then you can adjust the recipe to your taste. Change a single ingredient and your entire worksheet is automatically recalculated. You can test the outcomes of various plans and strategies in an instant. What a timesaver!

## Come shop with us

Stop by your local Radio Shack and pick up Dynacalc right off the

shelf. And while you're there, take a look at our complete stock of nourishing software. Or send for our new 1987 Software Reference and Computer Guide. We've got classic programs for every taste!

**Radio Shack**<sup>®</sup>  
**The Technology Store**<sup>™</sup>

A DIVISION OF TANDY CORPORATION  
Circle 75 on Reader Service card. **POP QUIZ**

Send me an RSC-18 Computer Catalog.

Mail To: Radio Shack, Dept. 87-A-69  
300 One Tandy Center, Fort Worth, TX 76102

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ ZIP \_\_\_\_\_

Phone \_\_\_\_\_

combined them to save room. Next comes the disk-swapping routine activated by pressing either the D or the S key, and finally, the disk-naming routine. The latter places the name on track 17, sector 18. (My initial attempts to place the name on sector 1 produced several disk crashes.)

Line 80 performs the start of the directory-printout routine, which actually initiates printing in line 100. When you select this option, the program prompts you with "Prepare printer, then hit a key," and then asks you for the date before printing out. My screen instructions lead you back to the main program if you don't have a printer.

Line 90 performs the backup and disk-initialization routines, each of which produces the prompt "To drive?" If you don't type in a drive number here, the program returns to the directory in memory. Also, performing these two routines clears Menu/BAS from memory.

Lines 110, 120, and 130 create the top line of the screen display, which contains the prompts used throughout Menu/BAS.

Line 140 performs several functions, including finishing off the directory display. It also performs acknowledgement and resetting functions for most of the subroutines.

Line 150 holds the error-indication routine for the entire program, which is

called only when you make a major mistake (simply striking an invalid key won't activate it).

Lines 160 and 170 contain the paging routines. They perform the required numeric manipulations for displaying the proper directory page.

Lines 180 and 190 perform cursor movement. Line 180 computes the requested offset, and 190 checks to see if the offset is a valid screen location before moving the cursor there.

Line 200 is the entry point for the Run, Load, Kill, name-change, and file-transfer routines. This line first determines which file name will be used in the sub-routine, and then branches off to the proper function.

Line 210 contains the Load and Run functions. It chooses between the Load and LOADM commands for each file, and produces an error message if you try to run a machine-language file.

Lines 220 and 230 make up the Kill function. At the yes/no prompt produced here, you can press the enter key to return to the directory without killing a file.

The routines for changing a file name (Rename) and transferring a file (Copy) use lines 260-300 to validate file names and extensions, and to modify the latter for use in the Rename subroutine.

Line 240 starts the Rename subroutine. At the prompt, you must type in a

**Run, Load, or Kill a file**  
**Change a file's name**  
**Swap the Drive being viewed**  
**Transfer a file to another disk**  
**Name the disk being viewed**  
**Print out a Hardcopy of the menu**  
**Back up an entire disk**  
**Initialize a new disk**

*Table. Menu/BAS function keys and descriptions.*

complete file name and extension; you'll get an error message if you don't.

Line 250 marks the beginning of the Copy routine, which also requires an extension after file names. To keep the same file name during the transfer, type in a colon followed by the destination drive number.

The last two lines, 310 and 320, return the program to the last drive requested. They are also used in conjunction with the Swap routine for changing the drive being viewed. ■

*James Rinaldo would like to hear from readers with technical questions and comments. You can write to him at 237 Riverside Ave., Ben Lomond, CA 95005. Enclose a self-addressed, stamped envelope for a reply.*

# Check PPoint

Send your letters, club and BBS notices, and requests for assistance to Check PPoint, 80 Micro, 80 Pine St., Peterborough, NH 03458.

## Stop! Don't Do It!

In "PEEK Performance," by John Ashbury Majka (May 1986, p. 120) we told you to do something that could damage your Color Computer. Do not type in POKE 65315,54 and plug in a ROM pack with the power on, as we said you could do "without fear of damaging the computer" (p. 122, top of column 1).

We should have followed Martin H. Goodman's advice in "The Danger of ROM Packs" (HOT CoCo, November 1983, p. 116). Using POKE 65315,54 to turn off the interrupt "in no way de-

creases the chance of burning out the computer," as Martin pointed out. If the ROM pack is wiggled during insertion, its lands can cross those of the computer, shorting the 12-volt lines to the CPU and other chips.

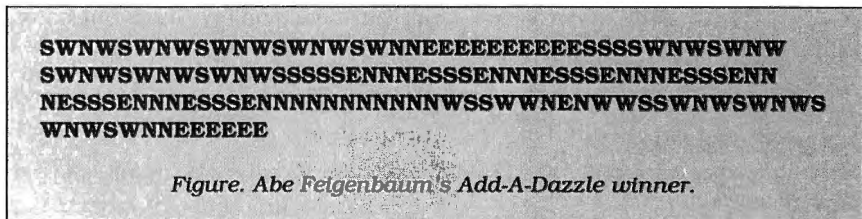
## Just Right for 64K

You can now run Type, the word processor that was featured in the May issue ("Just Write," p. 124), on a 64K CoCo. Author Nathan Roosth suggests the fol-

lowing list of changes (designated by line number):

- 1: 9645 to 16291 and 9650 to 16388.
- 3: 25,B0 to 40,02 and 25,AE to 40,00.
- 4: 25,AE to 40,00 and 25,B0 to 40,02.
- 6: 25,AE to 40,00 and 25,B0 to 40,02.
- 221: 16291 to 32767 in both places.
- 229: 9646 to 16384 and 9648 to 16386.
- 502: CSAVEM to SAVEM; 9648 to 16386 in both places.
- 601: CLOADM to LOADM.
- 602: 9648 to 16386 and 9649 to 16387.

Continued on p. 130



*Figure. Abe Feigenbaum's Add-A-Dazzle winner.*

# The Ultimate Color Computer

Enhancements  
for Productivity  
from HJL Products



To achieve maximum productivity with your Color Computer, you have to make it as easy as possible to get information into and out of the system.

This is why we developed the HJL family of high-performance enhancements for ALL MODELS of the Color Computer.

## The Keyboard - \$79.95

The overwhelming favorite of serious Color Computer users worldwide, the HJL-57 keyboard has the smooth, consistent feel and reliability you need for maximum speed with minimum input errors. Includes 4 Function Keys and sample function key program. Installs in just a few minutes with no soldering.

## The Numeric Keypad - \$89.95

The NumberJack is a self-contained, cable-connected keypad for heavy-duty number-crunchers. Besides the number keys, it has all the cursors, symbols and math keys, including autoshifted (one-touch) ADD and MULTIPLY. Comes complete with 3-foot cable and all necessary connectors for quick and easy installation without soldering.

## The Monitor Adapter - \$25.95

This universal driver works with all monochrome monitors, and is easily installed without clips, jumpers or soldering (except in some later CoCo 2s with soldered-in video chips). Here's crisp, clear, flicker-free monitor output with all the reliability you've come to expect from HJL Products.

## The Monitor - \$89.95

The GoldStar high-resolution amber monitor brings you the monochrome display that's preferred by most computer professionals today. Once you've used it you'll never connect your computer to a TV set again. The 12-inch diagonal CRT has an etched non-glare faceplate. (Requires adapter sold below)

## The BASIC Utility - \$25.95

Quick Basic Plus, a high-performance programming utility, can be used with any color computer that has four function keys. 26 pre-defined BASIC statements, 10 user-defined macros at a time (you can save as many sets of macros as you like), automatic line-numbering, word wrap, global search,

and instant screen dump to printer, make this software the BASIC programmer's dream come true. Comes with re-legendable 3-way reference chart. Specify disk or cassette.

## The HJL Warranty

Every HJL product comes with a full, one-year warranty and the exclusive HJL 15-day unconditional guarantee (except software).

## Pick a Pair & Save 15%

Now, for a limited time, we'll give you 15% off the price of any two or more products shown here. Just mention this ad when you order.

**Call Now, Toll Free**  
**1-800-828-6968**

In New York 1-800-462-4891  
International calls: 716-235-8358



**PRODUCTS**

Div. of Touchstone Technology Inc.

955 Buffalo Road • P.O. Box 24954  
Rochester, New York 14624

Circle 491 on Reader Service card.

**Ordering Information:** Specify model (Original, F-version, or CoCo 2 Model Number). Payment by C.O.D., check, MasterCard, or Visa. Credit card customers include complete card number and expiration date. Add \$2.00 for shipping, 3.50 to Canada; except monitors (call for shipping charges before ordering monitors). New York state residents add 7% sales tax. **Dealer Inquiries Invited**

**POP QUIZ**

It's not just

# CHILD'S PLAY

but a total application software series.

It's a WORD PROCESSOR. It's a DATA BASE. It's a SPREAD-SHEET. And each program of the CHILD'S PLAY software series is available in three different levels of sophistication so you can custom fit CHILD'S PLAY to your individual needs.

## Easy is Better!

It took us a year and a half to complete the CHILD'S PLAY series. Our goal was to produce software easy enough for a child to use, yet versatile enough for the home or professional user. The end result is software so easy, so much fun for everyone to use, it's like CHILD'S PLAY.

## A Mouse and Click-Down Menus

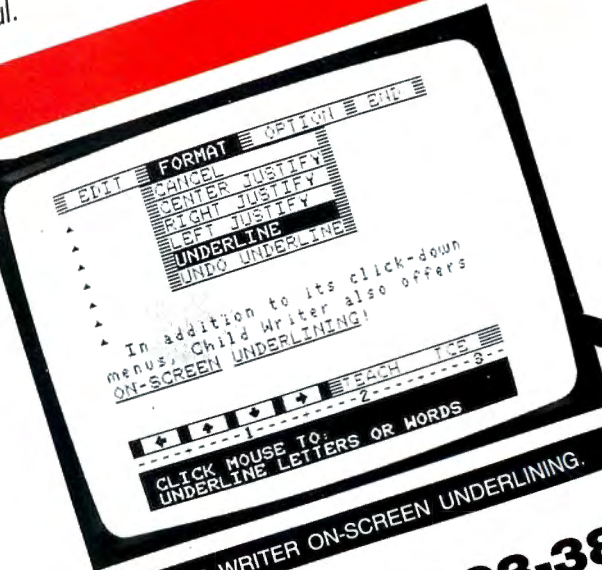
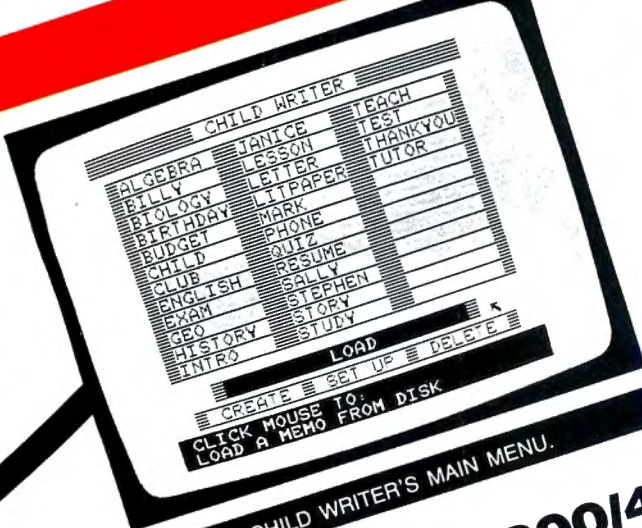
CHILD WRITER, our elementary word processor, is currently being used in schools by second grade children with amazing ease. Teachers tell us that kids are fascinated with the total control they have with a mouse. Just point and click! And we incorporated click-down menus to eliminate having to memorize dozens of commands. Simple instructions are right there on the screen, but only when you want them. Click the menu in when you need help and click it out when you don't. CHILD WRITER is not only easy to use, it's more fun and powerful.

Does your word processor underline text on the screen? All of the CHILD'S PLAY word processor programs do. For the first time you can reproduce on paper exactly what you've created on the screen. It's neat!

## More Sophistication

We could have stopped developing when we completed CHILD WRITER, but we knew that someone always wants more. So we developed MEMO WRITER, designed for the home user. And soon, we will have BUSINESS WRITER, the ultimate word processor designed for professional use.

# MOUSE



# 1 800/4TC-4TCE or 301/963-3848

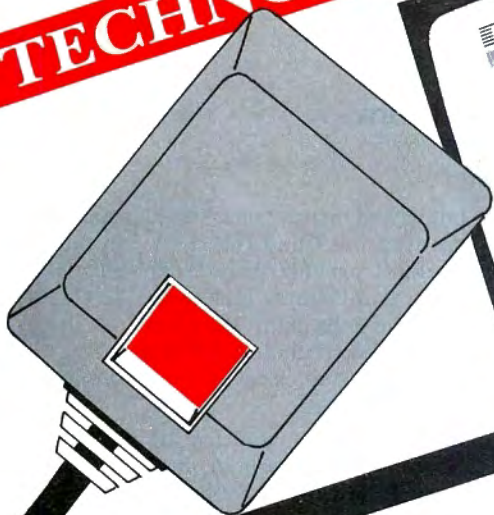
**TCE Programs, Inc.**  
PO Box 2477  
Gaithersburg, MD 20879 2477

## More Power

CHILD FILER and CHILD CALC are our elementary database and spreadsheet programs. LIST MANAGER and SIMPLE CALC are designed for the home user. BUSINESS MANAGER and BUSINESS CALC are for professionals.

All of these programs, no matter what level of sophistication, are completely compatible with the other CHILD'S PLAY applications on the same level. And, data can be shared between applications by using our unique NOTE PAD feature.

# TECHNOLOGY



NOTE PAD, DATA TRANSFER FEATURE.

NOTE PAD is the program vehicle we use to transfer data when you jump from one application to another, as well as move, cut, and paste text within your word processing program. Information from your database program is stored in NOTE PAD and made available for sharing with the other CHILD'S PLAY programs. It is a breeze to use and it sure beats retyping lots of data from one application program to another.

We have designed this software series for everyone. It doesn't matter if you are using a computer for the first time, or if you are a seasoned hacker, the CHILD'S PLAY application software series is for you. Write or call for more detailed information about the CHILD'S PLAY software series. Ask for the free TCE catalog with over 75 additional Educational Software titles. Ask about your 80 MICRO discount too.

NOW AVAILABLE FOR THE MODEL 4

Available through express order at Radio Shack®.

The CHILD'S PLAY Software Series is available for the Tandy 1000.\*

\* Tandy 1000 is a registered trademark of Tandy Corp.

Educational Level for the Radio Shack® Color Computer

CHILD WRITER 32/64K disk \$54.95  
(network version 32/64K) \$99.95

CHILD FILER 32/64K disk \$54.95  
(network version 32/64K) \$99.95

CHILD CALC 32/64K disk \$54.95  
(network version 32/64K) \$99.95  
Elementary Level Series TBA

MEMO WRITER 64K disk \$64.95  
(network version 64K) \$129.95  
LIST MANAGER 64K disk \$64.95  
SIMPLE CALC 64K disk \$64.95  
Home Use Level Series TBA

BUSINESS WRITER \$99.95  
64K disk  
BUSINESS MANAGER \$99.95  
64K disk  
BUSINESS CALC 64K disk \$99.95  
Business Level Series TBA

PROOFREADER \$34.95  
(20,000 words) 32/64K  
MASTER PROOFREADER \$54.95  
(50,000 words) 64K

## 75 ADDITIONAL EDUCATIONAL SOFTWARE TITLES AVAILABLE

### POP QUIZ

Circle 520 on Reader Service card.



Call us!

800/4TC-4TCE

Continued from p. 126

You can delete the references to tape in the Input statements in lines 500 and 600, although this isn't necessary to run the program.

These changes move the buffer for saving text to the top of accessible memory, which increases the memory available for text and frees the previously saved buffer for the disk system's operating requirements. One cautionary note: Don't use shift-zero to change lowercase to uppercase. It causes the program to lock up.

### It's a Dud

William C. Garretson's fireworks program in the July 1986 HOT CoCo section ("Fireworks Factory," p. 120) requires an

additional modification to run on cassette Color Computers. In line 130 of the Basic loader, the 14th data item (7) must be changed to 3, and the four-digit number at the end of that line should be 2863.

Also, the program captions should be reversed.

### Our Man in Hopatcong

*Abe Feigenbaum of Hopatcong, NJ, is showing no mercy. A previous two-time winner in Richard Ramella's Mindbusters contest, Feigenbaum won Puzzle Contest IX—Add-A-Dazzle—for his third title. His entry earned a score of 7,095 and is shown in the Figure.*

*Feigenbaum previously won subscriptions to HOT CoCo and 80 Micro for*

*his superior efforts. This time, we'll send him an "I Break for 80 Micro" bumper sticker.*

—Eds.

### Clubhouse

►Adebayo Adeyemi (Factory Dept., PMB 2230, Yola, Nigeria) would like to start a CoCo user's group in that country and hear from people interested in exchanging information about their computers.

►Allen Snook writes that the Direct Access CoCo Club (5203 Wheeler Road, Oxon Hill, MD 20745) publishes a bi-monthly newsletter for CoCo and MC-10 users. Send a self-addressed, stamped envelope for a free sample newsletter and information about the club. ■

# Doctor ASCII

by Richard E. Esposito and Richard W. Libra

*Having technical difficulties? Consult the Doctor for an answer. Due to the volume of mail Doctor ASCII receives, we can't guarantee publication of your query. Please send a self-addressed, stamped envelope with all letters to Doctor ASCII, c/o 80 Micro, 80 Pine St., Peterborough, NH 03458.*

### From the Bookshelf

**Q:** I want to use both sides of my double-sided disk drives under OS-9. Although the drives aren't from Radio Shack, they are connected with a Radio Shack controller. The *OS-9 Technical Reference Manual* says that you can change the device drivers or descriptors but doesn't tell you how to do it. Can you suggest a book that provides good information on OS-9? (*Bob Struetng, Batesville, IN*)

**A:** The *Rainbow Guide to OS-9* by Dale Puckett (Radio Shack catalog number 26-3190; \$16.95) is the most readable book on OS-9.

### Off the Track

**Q:** I replaced a 40-track TEAC 55B disk drive with a TEAC 55F, thinking that I had got a double-sided, 80-track drive. I left the jumpers set as for the 55B, moved the old drive's resistor block, and

installed the 55F as drive 1. Drive selection works fine: The light comes on, the motor runs, and formatting begins. But during verification, the drive clatters and I get an I/O (input/output) error. I did some research and discovered that the 55F is a 160-track drive; the 55B is listed as an 80-track drive. I can't seem to format the 55B for 80 tracks with the J&M controller and JDOS. Can you help? (*Dennis Byrd, Moab, UT*)

**A:** I see two possible causes for the problem. First, your disks might not handle 96 tracks per inch (tpi). Before going further, format a 96 tpi-rated disk on your 80 track drive (160 tracks equals 80 tracks per side). If the disk formats properly, you can save and load Basic programs. Patch your DOS or buy one that supports 80 tracks.

Another possible cause is the format. The disk you're trying to read might be formatted on a 40-track drive (48 tpi), while the drive is expecting an 80-track (96 tpi) disk. See my September 1985 column (*HOT CoCo*, p. 13) for 80-track patches for DOS 1.1.

### Kit Confusion

**Q:** I own a new 16K Korean CoCo 2 (serial number 2050157) with Color Basic (CB). The Extended Color Basic (ECB) kit I bought contained an ECB ROM chip

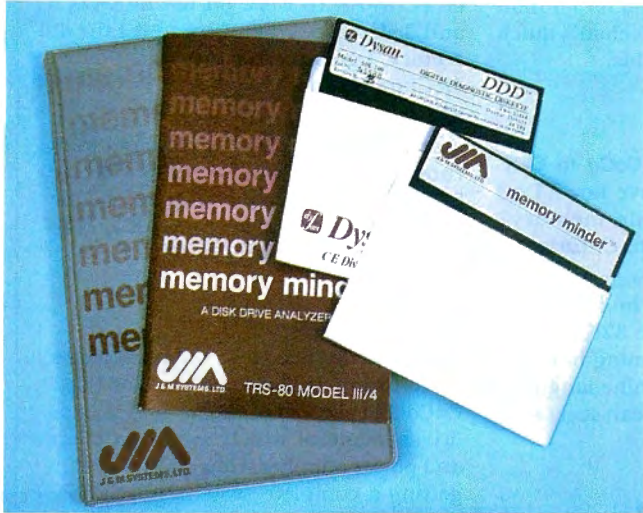
but lacked instructions. The kit supplier assured me I had the right chip but couldn't provide installation instructions. Can I simply replace the CB chip with the ECB chip? Must I change the jumpers surrounding the chip socket? Do I need to cut traces? (*John Shannon, Kittanning, PA*)

**A:** You must move all five jumpers (J1-J5) to the 128K position and replace the Basic ROM with Radio Shack part number AX9534, the Color Basic/Extended Color Basic combination ROM.

### An 80 Percent Solution

**Q:** My CoCo 2 is having trouble loading and executing certain programs. I've read in *HOT CoCo* and elsewhere that incompatibilities exist between programs written for ROM version 1.2 and those written for versions 1.0 and 1.1. I used EXEC 4117 and found I have version 1.2, although my screen says Basic 1.1 when I boot up. I also have Disk Extended Color Basic.

I suspect that the difference in ROMs is causing the problem and have ordered the February 1985 issue of *HOT CoCo*, which contains Mike Meehan's "A Quick Fix for Your ROM" (p. 44). Please tell me how I can make my 1.2 Basic compatible. (*Liz Wagner, Richland Center, WI*)



## MEMORY MINDER

Memory Minder is the most comprehensive disk diagnostic program available for microcomputers. It quickly and easily checks the vital operating parameters on your floppy drives, including spindle speed, head alignment, read sensitivity and others. Early detection and correction of possible problems prevents loss of valuable data.

Begin with the Quick Test, which analyzes six of the most important parameters in less than one minute; then proceed if necessary to one of the more in-depth tests.

A technician can use Memory Minder to align the drives without the use of an oscilloscope. The users manual helps interpret the screen graphics for each test, and where adjustment is possible, provides general guidelines for adjustment of the drive. No special tools required!

### Model III/4

- (48 tpi Single Side) ..... \$ 79
- (48 or 96 tpi Double Side) ..... \$ 89
- (Combo 48 and 96 tpi Double Side) ... \$129

**Model 1000 & IBM Compatibles** ..... \$ 99

### Color Computer

- (Single Side) ..... \$ 59
- (Double Side) ..... \$ 75

(Add \$4 for shipping.)

Replacement Alignment diskettes available from \$33.



## HARD DRIVE FOR TANDY 1000

Give your Tandy 1000 the hard drive advantage—increased disk access speeds and a vast amount of storage—with our 10 MByte hard drive. The drive fits in the second floppy drive position in the Tandy 1000, and because it is low power, it does not strain the system's power supply. The complete system consists of a low power hard drive, controller, cables, and easy-to-follow installation instructions. The system will boot from the hard drive after installation.

**10 MByte Hard Drive for Tandy 1000** ..... \$495

(Add \$7 for shipping.)

We accept VISA, Mastercard, and prepayment. Or we can ship COD for cash or certified check. We ship via UPS ground within the continental US. Blue Label and international orders extra.



15100-A Central SE  
Albuquerque, NM 87123  
(505) 292-4182

Circle 415 on Reader Service card.

**MS-DOS AND COCO SOFTWARE CMODEM TELECOMMUNICATIONS PROGRAM \$100-FLEX, OS/9 OBJECT-ONLY versions: EACH \$50-FLEX, OS/9** menu-driven with terminal mode, file transfer, MODEM7, XON-XOFF, etc.

**SUPER SLEUTH DISASSEMBLERS EACH \$99-FLEX \$101-OS/9 OBJECT-ONLY versions: EACH \$50-FLEX, OS/9, COCO**

interactively generate source on disk with labels, include xref, binary editing specify 6800, 1, 2, 3, 5, 8, 9/6502 version or Z80/8080.5 version

**CROSS-ASSEMBLERS EACH \$50-FLEX, OS/9, MS-DOS \$100 for 3 \$200 for all** specify for 180x, 6502, 6801, 6804, 6805, 6809, Z8, Z80, 8048, 8051, 8085, 68000 modular, free-standing cross-assemblers in C, with load utilities and macros 8-bit (not 68000) sources for additional \$50 each, \$100 for 3, \$300 for all

**NEW: OS/9-68K**

**Computer Systems Consultants, Inc. 1454 Latta Lane, Conyers, GA 30207**

Telephone 404-483-4570 or 1717 to order or to request a catalog.

Most programs in source: you must provide computer, O.S., disk type.

VISA and MASTER CARD accepted: US funds only; add 5% shipping.

FLEX™ Technical Systems Consultants; OS/9™ Microware; MS-DOS™ Microsoft.

Circle 400 on Reader Service card.

## HARD TO FIND COMPUTER SUPPLIES

Cloth binders & slips like Tandy's. Vinyl binders, boxes and folders—many sizes. Disk pages, envelopes & labels. Imprinted in low quantities.

### 5 1/4" DISK SPECIALS

|            | 10-90  | 100-400 | 500 +  |
|------------|--------|---------|--------|
| BASF SS/DD | \$1.25 | \$1.12  | \$1.00 |
| BASF DS/DD | 1.45   | 1.32    | 1.20   |
| BASF DS/QD | 2.09   | 2.00    | 1.90   |

for Tandy 2000

**BULK DISK SPECIAL**, with envelopes, boxed in 100's, 100—\$65.00 500—\$300.00.

Much more! Low prices. Fast friendly service. Call or write for free catalog.

**ANTHROPOMORPHIC SYSTEMS LIMITED**  
376 East St. Charles Road  
Lombard, IL 60148  
1-312-629-5160 1-800-DEAL-NOW

**A:** Programs that use undocumented ROM calls must be patched on an individual basis. Even Mike Meehan's quick fix is only 80 percent reliable.

### True Memory

**Q:** I upgraded my 16K CoCo to 64K. What advantages do I have now? Do I have 48K more available memory? (*Linda Richardson, Milton, Ontario*)

**A:** Since the Basic interpreter starts at memory address A000 hexadecimal (32768 decimal), you have 32K of available RAM when programming in Basic. Using sophisticated machine-language techniques, however, you can access the other 32K.

### Back Up to Scratch

**Q:** I recently purchased a True Data 5-megabyte hard disk for my CoCo. I'm very satisfied with it; however, the hard drive is presenting unexpected problems.

The disk is formatted into 31 directories to conform to Tandy software. While I can move easily between directories using the DRIVEX command, my VIP Writer software doesn't work with more than four drives, so it accesses only drives zero through 3. How can I access all 31 drives? Can I send POKEs to toggle the Multi-Pak Interface using VIP software? (*Tom Altaffer, Tucson, AZ*)

**A:** Keep a drive from zero to 3 as a scratch drive and use the Backup command to copy one of the higher disks down. Edit the information and then back it up to its original drive.

### First Things First

**Q:** When I try to save something on my disk drive I get an I/O error. I know that on my other computer I have to format a disk before I can save data on it. Is this true on the CoCo? If so, how is this done? I didn't receive instructions with my CoCo and I am now totally lost. (*Mike Bentofsky, Auburn, NY*)

**A:** You must format CoCo disks by typing DSKINn, where n is the number of the disk drive containing the disk to be formatted.

You can order CoCo manuals through your local Radio Shack store or Computer Center. Ask for *Color Computer Disk System* and *Getting Started with Extended Color Basic*.

### Porting Basic to MS-DOS

**Q:** After reading your advice to J.R. Lavalley (March 1986, p. 148), I bought SDISK and PC-XFER so that I could transfer to my IBM PC programs written

in Basic on my CoCo. I can't get SDISK or PC-XFER to work on my 64K CoCo and disk drive. When I try to list the directory, I get an error message. (*Robert McClure, Vernon, CT*)

**A:** You can transfer only Basic programs saved in ASCII format, and even those files will need editing. To use SDISK, you must know how to use the OS9GEN command to do a SYSGEN under the OS-9 operating system.

### Play It Safe

**Q:** What do I need to know to add a disk drive to my 16K Extended Color Basic CoCo 2? I see lots of ads for inexpensive drives, some of which need controllers and power supplies. How can I tell if I'm getting a complete system? Right now, I'm too scared to buy non-Radio Shack hardware.

What about the instructions in "64K Modification Revisited" (*HOT CoCo*, June 1985, p. 40)? Will they tell me what I need to know to upgrade my CoCo? I know nothing about electronics and would hate to have my computer blow up. (*Jeff Smith, Tacoma, WA*)

**A:** If you have limited hardware knowledge, you should stick with Radio Shack's repair and upgrade service. Although it costs about \$50 more for them to do the work, you won't have to worry about the high cost of fixing a fried computer because you've misplaced a chip, wire, or solder joint.

### Port Traits

**Q:** I own a CoCo 2 with Extended Color Basic 1.2. My company has offered to supply me with an IBM PC or compatible. I'm considering a Tandy 1000. I'd like to port my CoCo software to the new machine. Can I run CoCo programs (on tape or disk) written in Basic on a 1000? Will my Instant CoCo tapes run on the 1000? What about software like EARS, Supervoice, Colorware digitizers, OS-9, and so on? (*J.M. Gutierrez, Miami, FL*)

**A:** To run the CoCo's Basic programs on the Tandy 1000 (only programs without embedded machine-language routines will work), you'll need CoCo Util (\$29.95) from Spectrum Projects (P.O. Box 21272, 93-15 86th Drive, Woodhaven, NY 11421, 718-441-2807). You'll have to save the programs in ASCII format before attempting the transfer.

The commercial packages you mentioned won't run on the 1000 because they require the 6809 chip; the 1000 uses Intel's 8088 microprocessor.

### Safety in Numbers

**Q:** Three years ago, I bought a Tandy





# PERRY COMPUTERS



CALL

**1-800-248-3823**

| <b>COLOR COMPUTERS</b>                           |           | LIST PRICE | OUR PRICE |
|--|-----------|------------|-----------|
| 26-3127 64K Extended Color Computer 2            | \$199.95  | \$169.00   |           |
| 26-3131 Thinline Disk Drive 0 for Color Computer | 299.95    | 240.00     |           |
| 26-3018 Extended Basic Kit                       | 39.95     | 36.00      |           |
| 26-3030 OS-9 With Editor Assembler               | 69.95     | 59.50      |           |
| 26-3012 Deluxe Joystick                          | 29.95     | 25.00      |           |
| 26-1208 CCR-81 Recorder                          | 59.95     | 50.00      |           |
| 30001170 VIP Integrated Library                  | 149.95    | 139.00     |           |
| 30001110 VIP Writer                              | 69.95     | 59.00      |           |
| 30001210 Telewriter 64 Tape                      | 49.95     | 42.00      |           |
| 30001220 Telewriter 64 Disk                      | 59.95     | 49.00      |           |
| 30009110 Botek Interface                         |           | 59.00      |           |
| <b>TANDY 3000</b>                                |           |            |           |
| 25-4001 Tandy 3000 One Disk 512K                 | \$2599.00 | \$1900.00  |           |
| 25-4010 Tandy 3000 One Disk & 20 Meg HD 512K     | 3599.00   | 2600.00    |           |
| 25-4030 512K to 2 Meg Expansion Board            | 499.00    | 395.00     |           |
| 25-4033 Math Co-Processor for 3000               | 399.95    | 339.00     |           |
| 25-4050 1.2 Meg Disk Drive Kit for 3000          | 299.95    | 255.00     |           |
| 25-4062 20 Meg Hard Disk Kit                     | 799.00    | 679.00     |           |
| 25-4101 MS-DOS 3.1/Basic/DeskMate                | 99.95     | 85.00      |           |
| <b>TANDY 100, 200, 600</b>                       |           |            |           |
| 26-3901 Tandy 600 Port Comp 32K 3 1/2 DD         | \$1599.00 | \$1195.00  |           |
| 26-3904 Basic Rom for Tandy 600                  | 129.95    | 110.00     |           |
| 26-3910 92K RAM Upgrade for Tandy 600            | 399.95    | 340.00     |           |
| 26-3860 Tandy 200 Port Comp 24K                  | 799.00    | 650.00     |           |
| 26-3866 24K RAM Memory Exp Chip for 200          | 199.95    | 170.00     |           |
| 26-3802 Tandy 100 Port Comp 24K                  | 499.00    | 425.00     |           |
| 26-3816 8K RAM Upgrade for Tandy 100             | 49.95     | 42.00      |           |
| 26-3808 Port 3 1/2 Disk Drive for T100 T200      | 199.95    | 169.00     |           |
| 26-3815 Portable Disk Case                       | 24.95     | 21.00      |           |
| 26-3805 Acoustic Coupler                         | 39.95     | 34.00      |           |
| 26-1409 Printer Cable                            | 14.95     | 12.70      |           |
| 26-1410 Modem Cable                              | 19.95     | 17.00      |           |
| <b>MODEL 4D</b>                                  |           |            |           |
| 26-1070 Model 4D 64K 2 FD w/DeskMate             | \$1199.00 | \$895.00   |           |
| 26-1122 64K Memory Expansion                     | 69.95     | 65.00      |           |
| 26-1123 Model 3 to Model 4 Upgrade Kit           | 399.00    | 385.00     |           |
| 26-1134 Model 4 HD Kit for 15 Meg                | 79.95     | 67.95      |           |
| 26-1530 Multiplan Model 4                        | 199.00    | 169.00     |           |
| 26-1595 Super Scripsit Model 4                   | 199.95    | 169.00     |           |
| 26-1608 DeskMate for Model 4                     | 195.00    | 175.00     |           |
| 26-1635 Profile 4 Model 4                        | 249.95    | 200.00     |           |
| 26-2216 CP/M Plus Model 4                        | 149.00    | 127.00     |           |
| 26-2231 Double Duty Utility                      | 69.95     | 58.00      |           |
| <b>MODEL 6000 COMPUTERS</b>                      |           |            |           |
| 26-6021 Model 6000 512K 2 FD Comp                | \$4499.00 | \$2125.00  |           |
| 26-6022 Model 6000 512K 1 FD 15 Meg HD           | 5499.00   | 2975.00    |           |
| 26-6019 Model 6000 256K Memory Kit               | 199.95    | 185.00     |           |
| 26-6052 DT-100 Data Terminal                     | 795.00    | 600.00     |           |
| 26-1245 10 Meg Disk Cartridge System             | 2195.00   | 1750.00    |           |
| 26-6018 6000 Interface Kit for 26-1245           | 119.95    | 102.00     |           |
| 25-3022 1000/1200/3000/Interface Kit for 26-1245 | 199.95    | 160.00     |           |
| 26-4171 35 Meg Hard Drive Primary                | 2995.00   | 2545.00    |           |
| 26-4172 35 Meg Hard Drive Secondary              | 2695.00   | 1895.00    |           |
| 26-4173 70 Meg Hard Drive Primary                | 4295.00   | 3350.00    |           |
| 26-4157 Installation Kit for Primary HD          | 349.00    | 295.00     |           |

| <b>RADIO SHACK PRINTERS</b>                 |           | LIST PRICE | OUR PRICE |
|---|-----------|------------|-----------|
| 26-1276 DMP-105 Dot Matrix Printer          | \$ 199.00 | \$ 169.00  |           |
| 26-1275 TRP-100 Portable Thermal Printer    | 299.00    | 230.00     |           |
| 26-1280 DMP-130 100 cps Triple Mode Printer | 349.95    | 285.00     |           |
| 26-1268 CGP-220 Color Ink-Jet Printer       | 699.00    | 595.00     |           |
| 26-2830 PC-695 8-Color Digital Plotter      | 799.00    | 680.00     |           |
| 26-1277 DMP-430 24 Wire Matrix Printer      | 899.00    | 635.00     |           |
| 26-1270 DWP-510 43 cps Daisy Wheel          | 1495.00   | 1225.00    |           |
| 26-1274 DMP-2100P 24 Dot Matrix Printer     | 1495.00   | 1195.00    |           |
| 26-1279 DMP-2200 HiSpeed Matrix Printer     | 1695.00   | 1440.00    |           |
| 26-1269 PT-64 Printer Controller            | 249.95    | 210.00     |           |
| 26-1498 SW-302 Printer Switch               | 119.95    | 100.00     |           |
| 26-1447 Bi-Directional Tractor for DWP 510  | 219.95    | 186.95     |           |
| <b>TANDY 1200</b>                           |           |            |           |
| 25-3000 Tandy 1200 One FD & 10 Meg HD       | \$1999.95 | \$1525.00  |           |
| 25-3001 Tandy 1200 Two FD 256K              | 1499.00   | 1200.00    |           |
| 25-3044 Graphics Master                     | 695.95    | 540.00     |           |
| 25-3061 Captain Multifunction Board         | 599.95    | 475.00     |           |
| 25-3020 TCS-100 Tape Cartridge System       | 1999.00   | 1555.00    |           |
| 25-3021 TCS-100 Interface Kit 1000/1200     | 149.95    | 120.00     |           |
| 25-3130 MSDOS/BASIC                         | 89.95     | 76.50      |           |
| <b>TANDY 1000</b>                           |           |            |           |
| 25-1000 Model 1000 128K 1 FD & DeskMate     | \$ 999.95 | \$ 705.00  |           |
| 25-1001 Model 1000 256K 1 FD 10 Meg HD      | 1999.00   | 1475.00    |           |
| 25-1003 300-Baud Modem Board 1000/1200      | 149.95    | 125.00     |           |
| 25-1005 Disk Drive Expansion 1000           | 199.95    | 170.00     |           |
| 25-1014 RS-232C Plus Interface 1000/1200    | 99.95     | 85.00      |           |
| 25-1013 1200-Baud Modem Board 1000/1200     | 299.95    | 230.00     |           |
| 25-1025 10 Meg Hard Disk Drive              | 699.95    | 559.00     |           |
| 25-1007 Hard Disk Control Board             | 299.95    | 255.00     |           |
| 30051030 PJB Multifunction Board 512K       |           | 310.00     |           |
| <b>MONITORS AND DISPLAY ADAPTERS</b>        |           |            |           |
| 25-1020 VM-4 Monochrome Monitor             | \$149.95  | \$125.00   |           |
| 26-5111 VM-1 Monochrome Monitor             | 199.95    | 165.00     |           |
| 25-3010 VM-3 Green Monitor                  | 219.95    | 185.00     |           |
| 25-1021 CM-4 Color Monitor                  | 299.95    | 225.00     |           |
| 25-1022 CM-10 Color Monitor                 | 459.95    | 380.00     |           |
| 26-5112 CM-1 Color Monitor                  | 599.95    | 475.00     |           |
| 25-3043 Graphics Display Adapter            | 299.00    | 185.00     |           |
| 25-3046 Deluxe Text Display Adapter         | 249.95    | 199.00     |           |
| 26-3047 Deluxe Graphics Display Adapter     | 499.95    | 295.00     |           |
| <b>EPSON PRINTERS</b>                       |           |            |           |
| 20001015 Homewriter 10                      | \$295.00  | \$215.00   |           |
| 20001025 LX-80 Dot Matrix Printer           | 329.00    | 250.00     |           |
| 20001035 FX-85 Dot Matrix Printer           | 549.00    | 385.00     |           |
| 20001050 HI-80 4 Pin Plotter                | 599.00    | 390.00     |           |
| 20002010 RX-100 Dot Matrix Printer          | 499.00    | 400.00     |           |
| 20002030 FX-286 Dot Matrix Printer          | 799.00    | 550.00     |           |
| 20003020 LQ-800 24 Pin Head Dot Matrix      | 799.00    | 565.00     |           |
| 20003030 LQ-1000 24 Pin Head Dot Matrix     | 995.00    | 695.00     |           |
| 10081010 DX-10 Daisy Wheel Printer          | 299.00    | 255.00     |           |
| 10081020 DX-20 Daisy Wheel Printer          | 459.00    | 390.00     |           |
| 10081030 DX-35 Daisy Wheel Printer          | 899.00    | 765.00     |           |

For Technical Questions and Information on our complete line of computer accessories and current prices:

**CALL 1-517-625-4161**  
**FOR ORDERS ONLY CALL 1-800-248-3823**

**Monday-Friday 9-5, Saturday 9-3**

**124 S. MAIN ST. PERRY, MICH. 48872**

All prices and offers may be changed or withdrawn without notice. Advertised prices are cash prices. C.O.D. accepted (\$10.00 charge per carton on C.O.D. Call for further C.O.D. information.) M.C., Visa, add 2%. AX, add 3%. All non-defective items returned will be subject to 10% restocking fee. Defective items require return merchandise authorization. Call for R.M.A. Number before returning. Delivery is subject to product availability.

CGP-115 printer and, although it worked well, I didn't like its print style and the size of its graphics. Furthermore, few vendors supported the printer. After returning the CGP-115, I bought a CGP-220 that performs flawlessly. However, now that I no longer have the CGP-115, everyone supports it and ignores the CGP-220. Even Tandy offers only CODUMP and BWDUMP, and only one printer driver on the market offers a customizing feature for the CGP-220. Why do software writers ignore the CGP-220? (John C. Burke, Fremont, CA)

**A:** It's a matter of economy of scale. Your printer was never a big seller, but the lower-priced CGP-115 has sold well. Developers try to apply their talents in areas that will get the most sales. The most popular printers to date for the CoCo are Star Micronix's Gemini 10 series.

### What's in a POKE?

**Q:** I've been using POKE 359,57 to halt the VDG (video-display generator) reset. Can you explain how it works? (Minerva Bacus, Detroit, MI)

**A:** RAM addresses 359-361 contain a hook to allow interception and modification of data to be displayed. Color Basic sets it to \$7E \$82 \$73 (JMP \$8273) and Disk Extended Color Basic changes it to \$7E \$CB \$4A (JMP \$CB4A). By modifying these hooks or initiating a jump to one of your routines and a subsequent jump from your routine to the original hook's destination, you can enhance or change the normally displayed output.

### In a Fix Over ROMFIX

**Q:** I own a Color Computer that was up-

graded from 16K to 64K. I added a J&M controller with JDOS and two disk drives to my system and tried to transfer my ROM packs to disk using ROMFIX (HOT CoCo, September 1983, p. 34). Everything works fine until I try to load and run the ROM-pack programs from disk. The EXEC command just puts the JDOS introductory message back on the screen after the program is added to the disk. I think the source of the problem is JDOS. I added Reset, a patch supplied by my JDOS distributor, to Radio Shack's DOS, but putting my CoCo into DOS with this program didn't eliminate the problem. Can you help? (Mary Dwyer, Danielson, CT)

**A:** ROMFIX's 64K boot negates the patch you are using. For ROMFIX to work correctly, Radio Shack's DOS must be in ROM. ■

# Color Monitor

by Scott Norman

It's data-base time once again. Dave Jackson of JTJ Enterprises in Nashville, TN, recently sent me a copy of his new CoCo Base I. I haven't explored all its capabilities, but I like what I've seen so far.

CoCo Base I is *different*. Everything but the built-in screen editor is written in Basic, and while the data handler won't set any speed records, it is very accessible for study. If you're a programming devotee, dig into CoCo Base I and see how Dave did the file manipulation and how he made Basic the internal programming language for selecting records and setting up reports.

Even a sophisticated Basic data-base manager is hardly news anymore. What sets CoCo Base I apart is its "relational" nature. It can work with information spread across files having different structures to generate yet another file from which it can produce a report. Files linked this way must have a data field in common.

## What's on the Menu

You access data-base processing programs through a main menu routine that ties invisibly into the machine-language full-screen editor. A single key-stroke will call up an applications routine, and one or two more strokes usually are enough to specify the opera-

tion you want to perform.

The text editor takes getting used to, since it defines command keys that differ from those in the Extended Color Basic editor.

The applications aren't very mysterious, just a collection of short programs for defining a data-base structure, entering and deleting records, searching for information, sorting data, preparing reports, and so on. CoCo Base I makes you more aware of the separate routines than do many other data managers.

The functions are conventional enough; the one disadvantage to CoCo Base's use of separate Basic routines is that you must pay more attention to which step comes next. This method of organization seems to facilitate jumping into existing files and trying something new after looking at the data. Here are the major routines:

- **Create:** This sets up a data file's structure: names and lengths of fields, and whether they will contain general alphanumeric characters or be treated as numerics. There are no special field types for dates, times, or other data structures.
- **Put:** This is the workhorse used to add, edit, or find individual records in a data file. You can also use it to get a quick, unformatted printout of a record.
- **Index:** It's bad form to rearrange a data

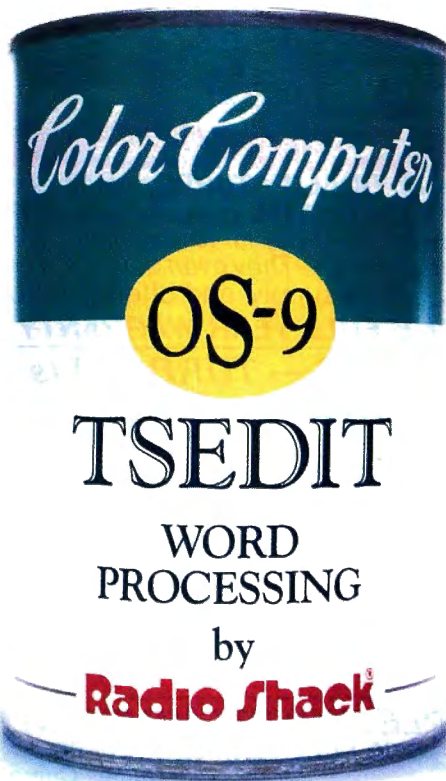
file every time you want to sort it. Index reads your data and builds an auxiliary index file specifying the order in which records should be used when you specify sorting criteria.

● **Action:** A critical piece of the package, Action creates "template files" you use when printing reports. Templates are bits of code created with CoCo Base's editor that can contain any standard Basic statement; If. . . Then record selection criteria and Print# - 2 formatting commands are the most-used ones, I suspect. This is a cleverly designed routine because it gives you all the flexibility of Basic without the worries associated with I/O (input/output) routines.

● **Schedule:** This routine lets you write a complete report format by successively carrying out commands from several template files. What's more, you can specify one of three execution modes for each template: Do it just once, do it once for each record, or do it once for each record but observe the order specified by an index file previously created by Index. For example, a template that sets up the header of a report might be executed only once, while another carrying selection criteria and the printing order for data fields must be executed once per record.

● **Jobs:** Clever as it is, Schedule doesn't generate a report. It just creates another

*Continued on p. 140*



# “CANNED SOFTWARE FOR MY COCO?”

## Choose Radio Shack's TSEDIT and TSWORD— all you add is data.

Looking for low-cost word processing that's got more vitamins than the average alphabet soup? Then pick TSEDIT word processing (26-3264, \$34.95) and TSWORD text formatting (26-3267, \$39.95) for your disk-based, 64K Color Computer system.

## Packed with the nutrition you need for “wp-power”

TSEDIT comes with more than the minimum daily requirement of powerful features: full-screen editing, true lowercase letters, side scrolling, variable character-display size, global editing and multiple file merging. It's got everything you need to write a spicy novel, a tasteful resume, a luscious letter, or even a delicious . . . recipe!

## Mix with TSWORD to create gourmet “masterpieces”

TSWORD interacts with TSEDIT to give your documents a polished, professional appearance. After you type your text, TSWORD presents a graphic “layout” of each page. You can experiment with several format standards and see the effects of your decisions instantly with one quick “taste-test.”

TSWORD lets you set up or change such format standards as: top, bottom and side margins, paragraph indentation, running headers and footers, printing fonts, centered lines, tabs, justification, linespacing and page breaks. There's everything you need to whip up delectable four-star servings.

## Come shop with us

Stop by Radio Shack and pick up TSEDIT and TSWORD right off

the shelf. And while you're there, take a look at our complete stock of nourishing software. Or send for our new 1987 Software Reference and Computer Guide. We've got classic programs for every taste!

## Radio Shack® The Technology Store™

A DIVISION OF TANDY CORPORATION  
Circle 75 on Reader Service card. **POP QUIZ**

Send me an RSC-18 Computer Catalog.

Mail To: Radio Shack, Dept. 87-A-069A  
300 One Tandy Center, Fort Worth, TX 76102

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ ZIP \_\_\_\_\_

Phone \_\_\_\_\_

# TURBO-M™

Check Out Our Systems — High **QUALITY TURBO** motherboard at the **LOWEST** prices.  
 Our hard drive systems have **EXTRA** megabytes of **FREE** storage — **CALL**  
*(more megabytes for less megabucks)*  
**Our monitors are high resolution TTL** — They even have their own tilt and swivel base **FREE**  
 Powered by a heavy duty power supply, and offering **TRUE** — **8Mhz turbo speed**  
**ONE FULL YEAR WARRANTY**

## COMPARE OUR SYSTEMS — TURBO M is the COMPETITION



**SYSTEM A  
FLOPPY SYSTEM**  
**\$859.95**  
*Call for summer special prices*

**SYSTEM 22  
HARD DRIVE SYSTEM  
22 MEGABYTE SYSTEM**  
**\$1,359.95**  
*Call for prices*

**TURBO M PC COMPLETE SYSTEM**  
 Dual Speed CPU — 4.77 AND 8Mhz TURBO  
**IBM COMPATIBLE**

640 K memory  
 8 slot motherboard  
 150 Watt Power Supply  
 Monochrome TTL Card  
 Monochrome Display High Res.  
 Tilt and Swivel Base Monitor  
 Serial port (2nd port opt.)

1 parallel port  
 Clock calendar  
 Game Port  
 Keyboard 5151 style  
 Ram spooler  
 Printer spooler  
 DOS 2.11  
 G.W. Basic

**Toll Free Ordering 1-800-343-8841**

## TURBO M/AT—COMPLETE SYSTEMS STARTING AT \$2,359.95!!!

**ONE FULL YEAR WARRANTY**



**Comes Complete with 80286 processor**  
 6 and 8 Mhz Switch Selectable  
 8 Slot Motherboard  
 192 Watt Power Supply  
 1.2 Megabyte Floppy Drive  
 1 Full Megabyte of Memory on Motherboard  
 2 Parallel Ports — 2 Serial Ports  
 Clock Calendar  
 Hercules Compatible Monochrome Card  
 Monochrome Display-High Resolution  
 Tilt and Swivel Base  
 AT Keyboard

## ADD-IN BOARDS TO HELP YOU BUILD YOUR SYSTEM

|  |  |  |   |  |   |  |
|--|--|--|---|--|---|--|
| TURBO-M Motherboard<br>Dual Speed<br><br><b>\$199.95</b> | Monochrome Graphics<br>Card with<br>Printer Port<br><br><b>\$79.95</b>   | Floppy I/O Card<br>Controls Two Floppy<br>Drives, Serial Port<br>Parallel Port Clock<br>Calendar Game Port<br><br><b>\$99.95</b> | Winchester Hard<br>Drive Controller<br><br><b>\$134.95</b>                            | 10 Megabyte and 20 Megabyte Drives<br>Complete System<br>Drive, Controller, Cables<br>and easy to follow<br>instructions<br><br><b>\$349.95 — \$459.95</b> | Color Graphics<br>Card with<br>Printer Port<br><br><b>\$94.95</b> |  |
| 150 Watt<br>Power Supply<br><br><b>\$79.95</b>           | Multi-Function Card with<br>Space for 384K of<br>Memory, Serial Port<br>Parallel Port Clock<br>Calendar, Game Port<br><br><b>\$79.95</b> | 5151 Compatible<br>Keyboard with Separate<br>Cursor and<br>Number Pads<br><br><b>\$89.95</b>                                     | Monochrome Monitor<br>with High Resolution<br>Tilt/Swivel Base<br><br><b>\$159.95</b> | Floppy Drive Card<br>Control up to<br>Four Drives<br><br><b>\$39.95</b>  | PC DOS 3.1<br><br><b>\$80.00</b>                                  | Flip Top Cabinet<br>with Speaker<br><br><b>\$49.95</b> |

## MEGADISK™ HARD DRIVES

*Our Hard Drive Systems Are Compatible With*

**IBM PC and AT, HEATH/ZENITH, COMPAQ, COLUMBIA, PC CLONES, TAVA, EAGLE  
 TRS/80 Models I / III / IV / 4D / 4P / MAX 80 / COLOR COMPUTER, Tandy 1000**

Systems come complete with drive, controller, cables,  
 hardware and easy to follow instructions.

6 megabytes ..... **IBM** ..... starts at \$229.95  
 11 megabytes ..... **ETC.** ..... starts at \$349.95  
 22 megabytes ..... starts at \$459.95

**REMOVABLE MEDIA SPECIAL**  
**5 Megabyte Cartridge Hard Drive Now**  
**\$399.95**

Systems come complete with one free software driver for TRSDOS 6,  
 LDOS 5.1.x, DOSPLUS 3.4/4, or NEWDOS 80.CP/M is available.

6 megabytes..... \$399.95  
 10 megabytes..... \$599.95  
 20 megabytes..... \$799.95  
 30 megabytes..... \$999.95  
 40 megabytes..... \$1,299.95  
 5 megabyte removable w/30 or 40mb  
 ..... \$399.95

**Warranty Information:** TURBO-M systems come with a full year warranty for parts and labor.  
 TURBO-M systems are guaranteed to run all programs such as LOTUS, SYMPHONY, AUTOCAD,  
 FLIGHT SIMULATOR, DBASE, MICROGRAFX, WORDSTAR, LEADING EDGE W/P, RBASE.  
**MEGADISK hard drives are fully warranted for parts and labor.**

**Software Support Inc.-MicroSmart Inc.**  
**1-617-872-9090**

**TERMS and CONDITIONS:**  
 All prices are cash discounted. However, we do  
 accept MC, VISA, AMEX & DISCOVER credit cards.  
 C.O.D.'s are accepted. No deposit required.  
 Purchase Orders: Corporate, Government & School  
 P.O.'s are accepted. Please call for details.  
 Shipping Costs are calculated per order.  
 Please call for total.  
 Shipments of all in-stock products are made within  
 24 hours. Same day service is available upon  
 request — no added cost.  
 Not responsible for typographical errors.  
 Terms and Specifications may  
 change without notice.

**OUR NEW ADDRESS** 200 Homer Street  
 Ashland, MA 01721  
**OUR NEW COMPANY!**  
 Hours: Mon-Fri 10 am to 5:30 pm (est) Sat 4:00 pm

**Toll Free Ordering 1-800-343-8841**  
**Dealer Inquiries Invited**  
**Reader Service-Call 1-800-343-8841**

**Service & Returns:** It is our policy to repair all service  
 returns within 24-48 hours. Normally same day turn-  
 a-round is accomplished. It is necessary to have a  
 (Return Material Authorization to insure  
 speedy service.  
 IBM, TAVA, COLUMBIA, 5151, COMPAQ, EAGLE,  
 TRS/80, HEATH/ZENITH are registered trademarks  
 of IBM Corp., Tava Corp., Columbia Computer Corp.,  
 Key Tronics Corp., Compaq Corp., Eagle Computer,  
 Tandy Corp., Zenith Corp. respectively.  
 © 1986 Software Support, Inc. All rights reserved.  
 © 1986 MicroSmart, Inc. All rights reserved.

# TURBO-M™



## COMPARE OUR SYSTEMS

— **TURBO M is the COMPETITION**

### TURBO M PC COMPLETE SYSTEM

Dual Speed CPU

— 4.77 AND 8Mhz TURBO  
IBM COMPATIBLE

#### SYSTEM A FLOPPY SYSTEM

**\$859.95 —**

Call for summer special prices

#### SYSTEM 22 HARD DRIVE SYSTEM 22 MEGABYTE SYSTEM

**\$1,359.95**

Call for prices

640 K memory  
8 slot motherboard  
150 Watt Power Supply  
Monochrome TTL Card  
Monochrome Display High Res.  
Tilt and Swivel Base Monitor  
Serial port (2nd port opt.)

1 parallel port  
Clock calendar  
Game Port  
Keyboard 5151 style  
Ram spooler  
Printer spooler  
DOS 2.11  
G.W. Basic

A Norton Utilities style program, but even more.  
™ Norton Utilities Peter Norton.

**Toll Free Ordering 1-800-343-8841**

## Software Support Inc.-MicroSmart Inc.

**1-617-872-9090**

**TERMS and CONDITIONS:** All prices are cash discounted. However, we do accept MC, VISA, AMEX & DISCOVER credit cards. C.O.D.'s are accepted. No deposit required. Purchase Orders, Corporate, Government & School P.O.'s are accepted. Please call for details. Shipping Costs are calculated per order. Please call for total. Shipments of all in-stock products are made within 24 hours. Same day service is available upon request — no added cost. Not responsible for typographical errors. Terms and Specifications may change without notice.

**OUR NEW ADDRESS:** 200 Homer Street  
Ashland MA 01721

**OUR NEW COMPANY!**

Hours: Mon-Fri 10 am to 5:30 pm (est) Sat 4:00 pm

**Toll Free Ordering 1-800-343-8841**

**Dealer Inquiries Invited**

Reader Service-Call 1-800-343-8841

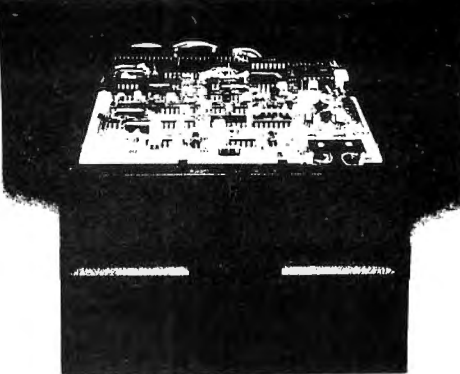
Service & Returns. It is our policy to repair all service returns within 24-48 hours. Normally same day turn-around is accomplished. It is necessary to have a Return Material Authorization to insure speedy service.  
IBM, TAVA, COLUMBIA, 5151, COMPAQ, EAGLE, TRS/80, HEATH/ZENITH are registered trademarks of IBM Corp., Tava Corp., Columbia Computer Corp., Key Tronics Corp., Compaq Corp., Eagle Computer, Tandy Corp., Zenith Corp. respectively.  
© 1986 Software Support, Inc. All rights reserved.  
© 1986 MicroSmart, Inc. All rights reserved.

# NEW DISK DRIVES

STARTING AT

## \$ 89.<sup>95</sup>

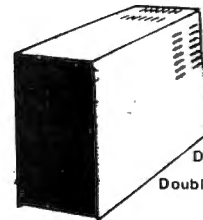
**WITH CASE &  
POWER SUPPLY  
\$129.95**



TANDON MPI TEAC

Speed 6 ms tk to tk and up  
Capacity 250k unformatted  
Tracks 40  
Warranty **now 1 YEAR**

New Low Price!



40 Tks 6Ms  
Double Sided  
Double Density

40 or 80 Tracks

1/2 Hght. Teac/Panasonic



We carry only the finest quality disk drives • no seconds • no surplus

**SATISFACTION GUARANTEED!!**

ALL DRIVES FULLY TESTED & WARRANTEED

Complete Disk Drive with Power Supply & Case ..... Teac ..... **\$129.95**

Two Drives in Dual Case & Power Supply ..... Teac ..... ~~\$279.95~~ **CALL**

1/2 ht double sided double density Disk Drives (Panasonic/Teac) <sup>Tracks 40</sup> **\$119.95**

1/2 ht double sided double density Disk Drive with ps & case <sup>Tracks 40</sup> ..... ~~\$199.95~~ **CALL**



How to use your new drive system on audio cassette

Single ps & case \$44.95 Dual 1/2 ht ps & case ..... \$54.95 Dual ps & case ... **Call**

Color Computer Controller (J&M)



**\$129.95**

**DRIVE Ø FOR RADIO SHACK COLOR COMPUTER**

TANDON, MPI OR TEAC DRIVE (SINGLE SIDED 40 TRACKS SPEED 5 MS TRK TO TRK & UP)

POWER SUPPLY and CASE, TWO DRIVE CABLE WITH ALL GOLD CONNECTORS

J&M CONTROLLER, MANUAL and DOCUMENTATION ..... ~~\$249.95~~ ..... **\$ SALE!**

BUY THE BEST  
FOR LESS!  
CALL!

**DRIVE Ø FOR RADIO SHACK COLOR COMPUTER**

PANASONIC 1/2 HEIGHT DOUBLE SIDED DOUBLE DENSITY DRIVE 500K unformatted

POWER SUPPLY and CASE, 2 DRIVE CABLE WITH ALL GOLD CONNECTORS

J&M CONTROLLER, MANUAL and DOCUMENTATION ..... ~~\$279.95~~ ..... **Super!! SALE!**

TAKE ADDED SAVINGS ON TWO DRIVE SYSTEMS

DISKETTES with free library case ..... **\$17.95**

Unadvertised Specials ..... **\$Call**

Drives cleaned, aligned & tested ..... **\$29.95**



10 Diskettes  
CONTROL DATA

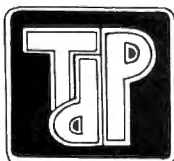
TECHNICAL STAFF ON DUTY, PLEASE CALL FOR ASSISTANCE.



**CALL US TODAY!!  
ORDER TOLL FREE**

**(617) 278-6555  
1-800-635-0300**

\* DEALER INQUIRIES INVITED.  
**(617) 278-6555**



**TRUE DATA PRODUCTS**

9. S. Main  
Uxbridge, MA 01569  
**(617) 278-6555**

HOURS MON-SAT 9-6 (EST)

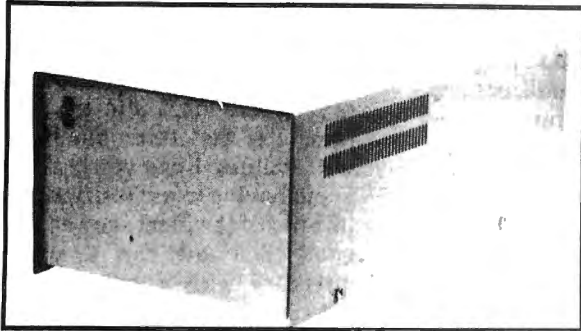
We welcome

- Visa / Master Charge
- Checks (allow 2 weeks for clearing)
- C.O.D. Add \$2.00

# New Hard Drives

----- COMPLETE SYSTEM ----- JUST PLUG IN -----

**Call For  
BEST PRICE**



**Warranty - One Full Year**

5 to 20 Megabyte, ready to run on the TRS  
80 Model I/III/IV/4P, color computer,

**64K UPGRADES \$39<sup>95</sup>**

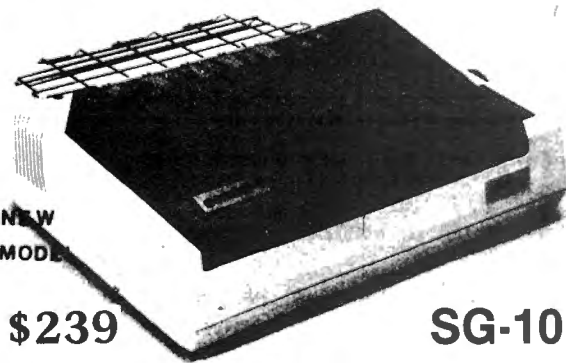
## star PRINTERS

- \* 100 - 120 - 160 CPS
- \* Bidirectional Logic Seeking
- \* Friction and Tractor
- \* 9X9 Dot Matrix
- \* True Decenders
- \* High Res-Bit Image Block Graphics

**PRINTER CABLES AND  
INTERFACES AVAILABLE**  
Call for current pricing

- \* Super Script-Subscript
- \* Underlining
- \* Backspacing Doublestrike
- \* 5, 6, 8 1/2, 10, 12 and 17 Pitch
- \* Programmable Line Spacing
- \* SIX (6) MONTH WARRANTY

**GEMINI 10X** (9 Inch Carriage, 120cps) Friction and Tractor ..... \$CALL  
**GEMINI 15X** (15 Inch Carriage, 120cps) Friction and Tractor ..... \$CALL  
**DELTA 10** (10 Inch Carriage, 160cps) Friction and Tractor ..... \$CALL  
**POWER TYPE** Letter quality



**NEW  
MODEL**

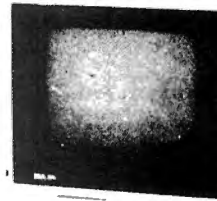
**\$239**

**SG-10**

## NEW QUALITY VIDEO MONITORS

Starting at **\$79.<sup>95</sup>**

**MONOCHROME  
COLOR MONITORS**



### VIDEO DRIVER

ENABLES YOUR COCO TO OPERATE WITH A  
VIDEO MONITOR INSTEAD OF A TELEVISION!

## SCREEN DUMP PROGRAM

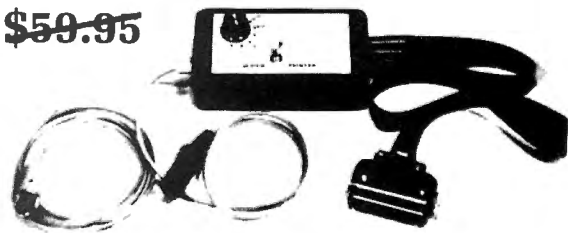
The best screen dump program for the Epson & Gemini  
printers ever!! Have the option of standard images  
or reverse w/regular or double sized pictures **\$19<sup>95</sup>**

### SP-3 INTERFACE for Color Computer

- 300-19,200 BAUD rates
- External to printer — No AC Plugs
- Built in modem/printer switch—no need for Y-cables or plugging/unplugging cables

**Only:**

**\$59.<sup>95</sup>**



### COMPLETE SYSTEM

**~~299~~<sup>95</sup>**

**NEW  
LOW  
PRICE**

now  
with  
screen  
dump

*Nothing more to buy!*

Dealer inquiries invited



**TRUE DATA PRODUCTS**

9 S. Main  
Uxbridge, MA 01569



**CALL US TODAY!!  
ORDER TOLL FREE**

**(617) 278-6555  
1-800-635-0300**

Continued from p. 134

disk file of commands for fetching and executing templates. Jobs runs this "job file" to produce a printed report.

● **Transfer:** This routine moves information between data files. It examines the names of the fields in each file structure and transfers only the data that shows up in both. You can use Transfer to merge two similar files or to transfer previously entered data to a new file whose structure has been modified. Used with the next routine (Update), Transfer can make a new data base containing information from several files. Here's where CoCo Base's relational nature really comes to the fore.

● **Update:** This routine is the other side of the relational data-base coin. Transfer creates a temporary report data base and partially fills it with appropriate fields from an existing file. You then use Update with however many related files are necessary to fill in the remaining fields. Finally, you can produce a composite report with Action, Schedule, and Jobs.

There are a couple of other routines: Totals, which produces a "quick-look" report totaling the numeric fields, and UTIL, which copies a disk's directory and file allocation tables.

Since the applications use only 34 grants, you can put a lot of data on the CoCo Base program disk and work with drive zero. I prefer to keep data on a separate disk in drive 1, however, so I always have to specify the full name of every file I want to call up, including the drive number. It would be handy to have a way of setting up a configuration file to tell the program about such requirements and also to indicate that I prefer to send information to my printer at 9,600 baud. You can use a simple POKE 150,1 at the beginning of the Menu routine to take care of that.

### Advice Column

Since several program modules create disk files, it makes sense to stick to a consistent set of file-name extensions. The

documentation recommends a few, including .STR for structure files from Create and .DBF for data-base files from Put. If you must include the :1 drive designator, as I must, when specifying a file from within CoCo Base, you might be limited to five- or six-character file names because there isn't much space on the prompting line.

When you build a structure file with Create, each data field must be assigned a three-character name consisting of a letter, a second letter or number, and the \$ symbol—the familiar Basic string variable format. You'll use these names to identify fields in an Action template. You must also tell the program whether a field is a field of characters or a number, give the field a descriptive heading, which becomes the prompt that appears when you fill in the data, and specify the field length. You may want to plan these assignments on paper first.

Numeric fields are always encoded by Basic as 5-byte quantities, while character fields can be up to 255 characters long. There are no computed fields that CoCo Base can fill in by performing calculations on other data.

The data is organized in "pages" of eight fields apiece. Besides representing the way information is shown on the screen, pages serve as logical dividers of material; you can store them in different files, for example. The capacity of a CoCo Base file is presumably limited by disk space, but it is probably hard to give exact figures because different applications create different numbers of report templates and other auxiliary files. Unfortunately, the documentation doesn't clarify this point.

The Put routine actually builds a data file with a structure specified by Create. You must enter every field by hand, since there is no way to copy unchanged information from one record to the next. You must also enter the names of both the structure and data files each time you use this and most other CoCo Base routines.

Put's Find option will search a character field for a specified target string, making the distinction between uppercase and lowercase characters. Once you've found the record containing your target, you can scan back and forth through the data a record at a time. The same sequential numbers assigned to records also serve to identify them, so it's okay to have many records with identical information in any field.

The Index routine is relatively fast, considering that it's in Basic, but it can only put records in ascending order. Any character field can be used for the sort.

Templates created with the Action routine are assigned Basic line numbers by the program that aren't visible on screen. Your first template statement will default to line 105, and each successive statement will be one line higher. Lines 101-125 are available for each template (you can back up from line 105 with control keys), so you can create elaborate chains of selecting and formatting commands. You might have to do this if you want a printout to skip over page perforations or print a header on every page.

There's no need to worry about using the same line numbers for several templates, even if they'll later be used together to generate a single report. The Jobs routine pulls templates into memory only when they are needed, so there will be no line number conflicts. ■

*Scott Norman is the manager of solid-state science at GTE Laboratories in Waltham, MA. Write to him at 8 Doris Road, Framingham, MA 01701.*

### Products Mentioned

JTJ Enterprises  
P.O. Box 110841  
Nashville, TN 37211  
CoCo Base I requires 64K and one disk drive. It sells for \$49.95.

## SPECTROGRAM

MAGAZINE FOR COLOR COMPUTER USERS.

- \* Programs for business, home management, self-improvement, games, utilities
- \* Reviews of Color Computer products
- \* Tutorials on programming in Assembly, C, Pascal, and Basic
- \* Contests

GROUP RATES: \$15 with orders of 5 or more subscriptions!



As an introductory offer, you can order the first year of SPECTROGRAM Magazine at 40% off the cover price. For \$18, you will receive 12 issues of the magazine that could become the most informative addition to your Color Computer system. We want to establish a line of two-way communication between our staff and our readers as an aid in serving your needs. Please enclose any comments or special requests with your subscription form.

PLEASE SEND ME 12 ISSUES OF SPECTROGRAM MAGAZINE FOR \$18 (40% OFF THE COVER PRICE).

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_

Check enclosed  Visa  Mastercard

Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

Mail to: SPECTROGRAM Magazine  
P.O. Box 138  
Rockford, IL 61105  
(815) 968-9600

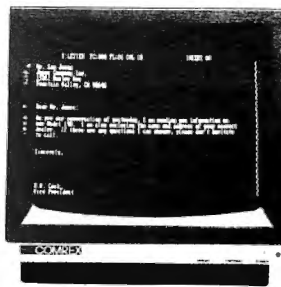
Circle 395 on Reader Service card.





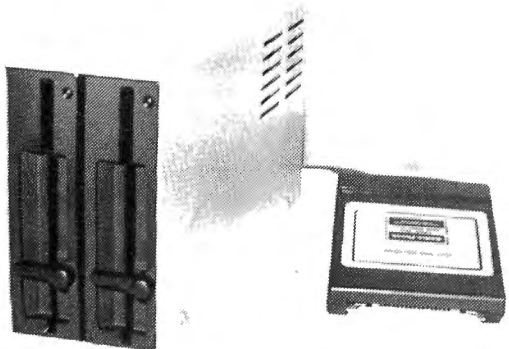
Drive 0 and 1 **279<sup>95</sup>**

One double sided drive with doubler board and new RS controller so you can have the equivalent of 2 drives in one. You can even backup from 0 to 1. Works with all CoCo's.



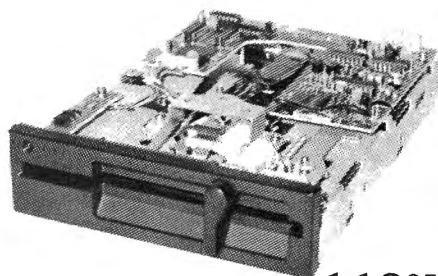
**AMBER MONITOR 59<sup>95</sup>**

Epson's Comrex 5650 has a 12" screen with 900 lines. Resolution for 80 column text and 18 MHZ band width. Retail price is 139.95. These are new, in factory sealed cartons, NOT used, repacked, or refurbished. Add 7.00 s/h. Monitor Interface for any Color Computer 29.95.



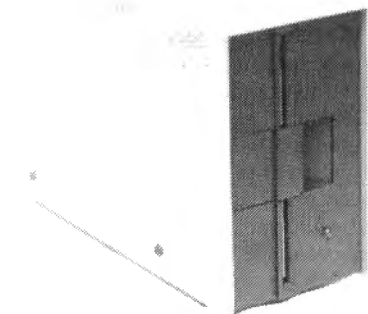
2 Drives **299<sup>95</sup>**

Both our drive 0 and 1 in one case, with cable and R.S. controller. The best just got better!



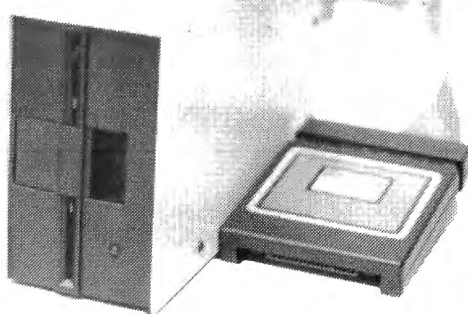
Drive 1 Upgrade **119<sup>95</sup>**

Add a second 1/2 height drive to your Radio Shack® 26-3129. Comes with 3 minute installation instructions, screwdriver required. Double sided version (Drive 1 and 2) and doubler board add 79.00



Drive 1 **125<sup>95</sup>**

Your Choice  
Silver or White



**199<sup>95</sup>** Drive 0

**SUPER DRIVE SALE**

Special prices on new first quality disk drives. They even have GOLD connectors on the back... Some other places charge 229.00 for dr. 1 and 299.00 for dr. 0, not us! Drive 1 is for mod I, Second Color Computer drive, or external mod III, IV. Drive 1 just plugs into the extra connector on your Drive 0 cable. Both drives are compatible with any version of the Color Computer and all versions of drives. Drive 0 is your first Color Computer drive and comes complete with cable, manual, and R.S. controller. For double-sided drive and doubler board add 79.00 (for Drive 0 & 1 or 1 & 2). Bare full hgt SSDD drive only 79.95.

**THE COMPUTER CENTER**

901-761-4565, 5512 Poplar, Memphis, TN 38119

Add \$4.90 for shipping and handling—Visa, MC & money orders accepted, No CODs  
Allow an additional 2 weeks for personal checks—Drive faceplates may vary slightly  
Prices subject to change without notice. Radio Shack is a registered trademark of the Tandy Corp.

## MS-DOS

### Tickling the Ivories

Maxi-Switch Co.'s Memory Pro keyboard for the IBM PC/XT/AT and compatibles features 10 user-defined keys and the familiar AT layout with the large, L-shaped enter key.

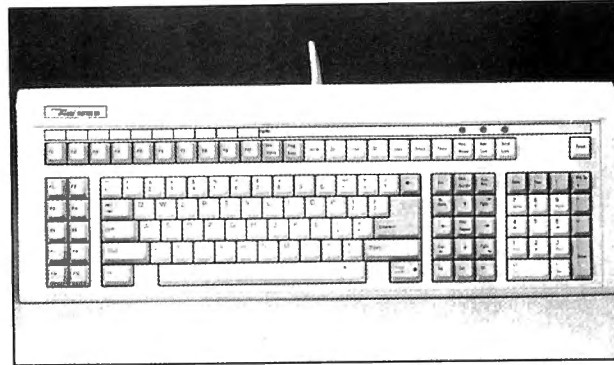
Each of the 10 "soft" keys uses EEPROM nonvolatile memory and can store up to 49 characters. Strung together, they provide up to 491 characters in one string. Optional memory expansion allows up to 100 characters per key and 991 characters per string.

The Memory Pro sells for \$195. For information, contact Maxi-Switch Co., 9697 E. River Road, Minneapolis, MN 55433, 612-755-7660.

Circle 567 on Reader Service card.

### Essential Matters

FINITE/GP is a scientific package for performing finite element analysis. It includes all programs necessary to perform analysis as well as all pre- and post-processing. The package includes support for most popular high-resolution



Maxi-Switch Memory Pro keyboard.

graphics boards and provides methods for producing high-resolution screen dumps on dot-matrix printers.

The package can perform the following types of analyses: plane strain and plane stress, three-dimensional stress, axisymmetric stress, axisymmetric thermal, planer thermal, potential flow, and space frame. All input functions are performed using labeled spreadsheets with on-line help available for every cell. All hardware functions are performed via Assembly-language routines for enhanced performance.

The package requires 640K RAM, a math coprocessor, and a graphics adapter. The

price is \$1,800. For more information, contact COADE, a division of International Thomson Information Inc., 8550 Katy Freeway, Suite 122, Houston, TX 77024, 800-231-0732. (Texas residents call 713-973-9060.)

Circle 566 on Reader Service card.

### Hi-Res Monitor

Zenith Data Systems' ZVM-1360 high-resolution color video monitor features a long-persistence phosphor CRT, compact styling, and a 13-inch-diagonal, reduced-glare screen.

The ZVM-1360 is designed for high-resolution video boards, such as the Tecmar Graphics Master. The monitor's resolution is 640-horizontal by 240-vertical pixels in noninterlaced mode and 640-horizontal by 480-vertical pixels in interlaced mode in a 50-line by 80-character format.

The monitor has an LED indicator, an on/off switch, and brightness/contrast controls on the front panel. Controls for horizontal and vertical size and centering are also provided. An optional tilt/swivel base allows for more flexibility.

The ZVM-1360 retails for \$799. For more information, contact Zenith Data Systems Corp., 1000 Milwaukee Ave., Glenview, IL 60025, 800-842-9000 ext. 1.

Circle 560 on Reader Service Card

## Compiled Basic Library

Komputerwerk's Finally! A Subroutine Library for Compiled Basic is just what its name implies. It works with the IBM Basic Compiler 2.0 and Microsoft's QuickBasic.

Finally! contains more than 100 subroutines that let you work with numeric and string arrays, change default drives, draw boxes and charts, and determine peripheral configurations, among other functions. The subroutines and functions can either be linked from the Finally! library or inserted at compilation time with the \$INCLUDE command. Each is documented and indexed.

A cross-reference utility scans unnumbered program lines to indicate the location of variables and spelling errors.

Finally! is not copy protected and comes with a 30-day, money-back guarantee. It costs \$99 plus \$4 for shipping and handling; combined with QuickBasic, the price is \$148 plus \$6. For information, contact Komputerwerk, 851 Parkview Blvd., Pittsburgh, PA 15215, 412-782-0384.

Circle 553 on Reader Service card.

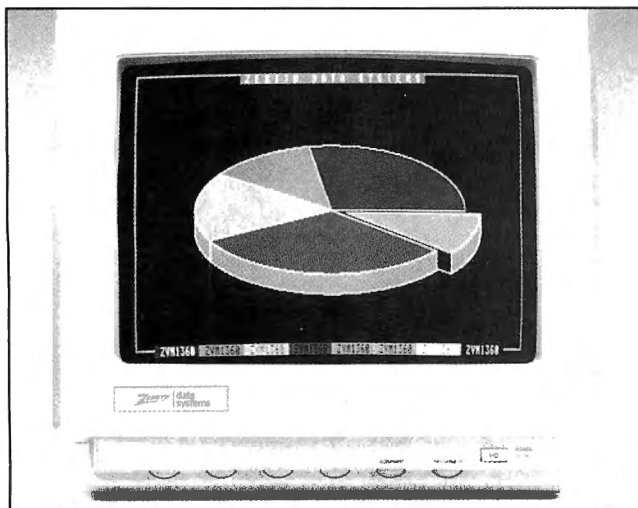
### IBM BIOS Tap Dance

Interlink Business Network Corp. has developed a ROM BIOS for graphics boards that are compatible with the IBM Enhanced Graphics Adapter (EGA). It can help manufacturers of compatible boards get around copyright restrictions on the IBM ROM BIOS.

Interlink's BIOS has been tested in-house and by AST and Tecmar. It runs on PC/XT/AT compatibles.

For price information and details, contact Interlink Business Network Corp., 2700 E. Imperial Highway, Building A, Brea, CA 92621, 714-579-0693.

Circle 565 on Reader Service card.

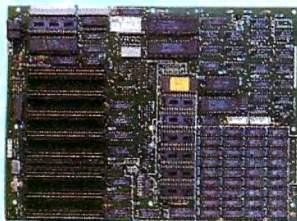
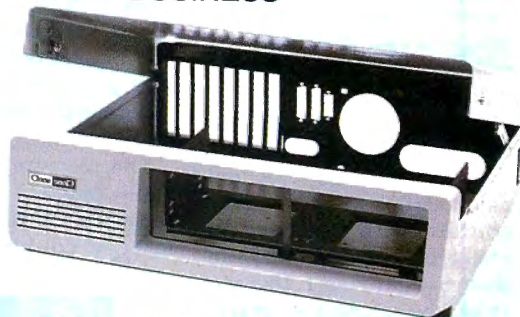


Zenith Data Systems' ZVM-1360 high-resolution color monitor.

# BUILD YOUR OWN IBM CLONE

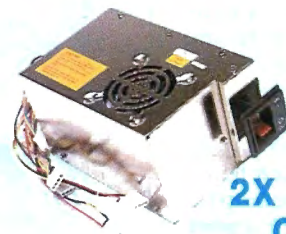
OR BUY ONE OF OURS COMPLETE FOR LESS THAN A TANDY 1000 AND GET REAL IBM COMPATIBILITY PLUS A ONE YEAR WARRANTY \*8 SLOTS  
 \*ACCEPTS FULL SIZE CARDS (Not the puny Model 1000 type)  
 \*COMPLETE COMPATIBILITY \*NO DMA FUNNY BUSINESS

Start with our high quality steel case with a flip-top that makes changing cards a snap. You won't void our warranty by opening the case. This is the foundation of your system. No cheap, flimsy plastic here. There are 8 slots and 7 of them accept both short and regular full length IBM add-on cards. You have room for up to 4 half-high drives. There is even a place for an additional fan. A speaker and all hardware are included. All you need is a Phillips screwdriver. . . . . \$ 89



Now for the heart of your IBM clone: the Main Board. No cost has been spared in manufacturing this fully IBM compatible, 640K RAM (already installed on the main board), 8 slot Clone of the IBM XT. The latest technology has been applied such as an 8087 socket and DMA along with our ROM BIOS giving you compatibility that Tandy 1000 and 2000 owners dream about but will never have. The board fits the case perfectly. You merely plug in the power connector, hook up the speaker and install the rest of your peripherals . . . . . \$249

Add our 135W (twice IBM's) power supply for all the power you are likely to ever need. It has outputs for the main board plus up to 4 disk drives. The IBM-style side switch mates with our case . . . . . \$ 99



**2X THE POWER OF AN IBM**

The Multi I/O card provides for 5 major functions—floppy disk drives (up to 4 DS/DD 360K drives); IBM parallel printer port; 2 serial (RS-232) ports, 1 populated, 2nd optional (\$10); Game port; Battery backup clock/calendar. Includes clock software and internal disk drive cable . . . . . \$ 149



Two video boards are available. The color graphics video card has 3 outputs; RGB TTL; composite color; composite monochrome, plus a light pen port and a connector for an RF modulator. Standard IBM resolution of 320x200 four color graphics and 640x200 monochrome graphics . . . . . \$ 99



Hi-Res Monochrome . . . . . \$ 129

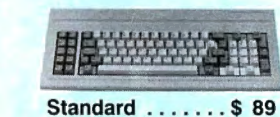


Color Graphics . . . . . \$ 99

Our monochrome graphics display card is Hercules compatible with a 720x348 TTL monochrome output. It runs Lotus 1-2-3 graphics and also has a parallel port . . . . . \$ 129



In order to finally see what you are doing we offer 2 monochrome video displays. The TTL display is able to display the hi-res output (720 x 348) of the Hercules or compatible card. This 12" video display has a non-glare display. Green or amber . . . . . \$ 110  
 The composite model is also able to display hi-res monochrome characters and graphics. Green or Amber with a 12" display . . . . . \$ 99



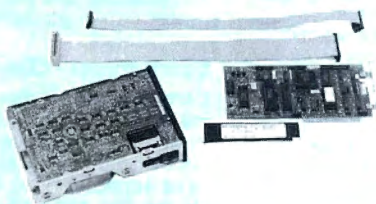
Standard . . . . . \$ 89



Deluxe . . . . . \$ 129

Keyboards are one area where nobody copied IBM. Many feel the standard IBM keyboard leaves a lot to be desired. We have the most popular aftermarket keyboards. The 5150 and the 5151 are capacitive types with the feel professionals demand. Both models offer lighted NumLock and Caps keys and the deluxe model has lighted Power and Cursor Pad keys along with a Reset key and a separate cursor and numeric keypad.

Want to go with a hard drive? How about a 20MB half-high, low-power hard disk drive? Our complete kit includes the drive, cables, controller and software. It fits right inside your Clone and you can forget the floppy. Boot directly from the hard disk. Future expansion is assured as the controller accepts a second hard drive whenever you are ready . . . . . \$ 489



The standard floppy disk controller is also available. It controls 2 internal and 2 external floppies like the Multi I/O card. This card comes with the internal 2-drive cable . . . . . \$ 59



IF YOU THINK THAT'S A GOOD DEAL...TRY THIS, WE'LL PUT IT TOGETHER FOR YOU AND GIVE YOU A DISCOUNT ON TOP OF EVERYTHING ELSE.

| SPECIAL #1                   | \$ 795 | SPECIAL #2                   | \$ 888 | SPECIAL #3                   | \$ 1299 |
|------------------------------|--------|------------------------------|--------|------------------------------|---------|
| Steel Flip-top Case          |        | Steel Flip-top Case          |        | Steel Flip-top Case          |         |
| 135W Power Supply            |        | 135W Power Supply            |        | 135W Power Supply            |         |
| 640K RAM Main Board          |        | 640K RAM Main Board          |        | 640K RAM Main Board          |         |
| 1 Half-high 360K Floppy      |        | Multi I/O Card               |        | 20MB Hard Drive              |         |
| Color Graphics Card          |        | 1 Half-high 360K Floppy      |        | Multi I/O Card               |         |
| Composite Monochrome Display |        | 1 Half-high 360K Floppy      |        | 1 Half-high 360K Floppy      |         |
| 5150 Standard Keyboard       |        | Color Graphics Card          |        | Composite Monochrome Display |         |
| DOS 2.11 and BASIC           |        | Composite Monochrome Display |        | Color Graphics Card          |         |
|                              |        | 5150 Standard Keyboard       |        | 5150 Standard Keyboard       |         |
|                              |        | DOS 2.11 and BASIC           |        | DOS 2.11 and BASIC           |         |

**Clone pro**

**AEROCOMP**

TEL: 214-339-8324 TELEX: 882761 AEROCOMP FAX: 214-337-4981  
 Redbird Airport, Hangar #8—PO Box 762426—Dallas, Texas 75376

Prices and specifications are subject to change without notice.

14 day money-back guarantee if you are not satisfied for any reason. Must be complete and in original shipping carton with all documentation. Shipping charges are not included.

Add \$70 for air delivery (\$35 for ground) in the lower 48

IBM is a trademark of International Business Machines

Tandy is a trademark of Tandy Corp.

Lotus and 1-2-3 are trademarks of Lotus Development Corp.

Hercules is a trademark of Hercules Computer Technology

Clone is a trademark of Aerocomp

CALL TOLL FREE WITH YOUR ORDER  
 800-527-0347 USA  
 800-442-1310 Texas  
 214-339-5104 Info

**Sound Editor**

Super Jupiter Editor (SJE) is a new program from Roland-Corp US that allows you to edit and organize MKS-80 Super Jupiter sound patches. The program can be integrated with Roland's Music Processing System (MPS) to form a complete sequencing and sound-editing environment.

SJE organizes 64 tone and patch settings into volumes contained in libraries in groups of 20. Each library can store as many as 1,280 settings. You can save several libraries on a disk for immediate access to thousands of sounds.

Sound parameters are displayed on the program's tone-summary screen, making it possible for you to edit sounds in context. The patch-summary screen displays the patch number, upper and lower tone names, mode, and other patch settings for all eight sounds in any of the eight available banks. Parameters and settings can be edited and sent to the synthesizer, saved on disk, or printed.

The Super Jupiter Editor runs on all Tandy MS-DOS computers with a minimum of 256K RAM. It also requires MS-DOS 2.0 or higher; an IBM monochrome, color, or enhanced graphics board; and Roland's MIF-IPC interface card, MPU-401 MIDI Processing Unit, and MKS-80 Super Jupiter. It sells for \$99.50.

For more information, contact RolandCorp US, 7200 Dominion Circle, Los Angeles, CA 90040-3647, 213-685-5141.

Circle 559 on Reader Service card.

**Word for Word**

The Software Division of Simon & Schuster General Reference Group offers Webster's New World On-Line Thesaurus. Based on Webster's New World Thesaurus, the program contains 120,000 synonyms and phrases (500,000 including prefixed and suffixed words). The thesaurus resides in RAM and is compatible with over 30 major word processors and other software packages.

With the on-line thesaurus, users can display a synonym

or phrase on screen with a single keystroke. The thesaurus can be set for intelligent scan (the program looks at words near the cursor and tries to build a matching phrase from the words in its dictionary) or limited scan (the program restricts its lookup to the word at the cursor position).

The program works on all Tandy MS-DOS computers. It requires 128K, DOS 2.0 or later, a double-sided disk

drive, and an 80-column display. The retail price is \$69.95.

For more information, contact Simon & Schuster Software, Simon & Schuster General Reference Group, 1 Gulf and Western Plaza, New York, NY 10023, 212-333-5800.

Circle 561 on Reader Service card.

**Make a Note**

SmartNotes is a memory-resident software package that allows you to attach notes to data-base records,

spreadsheet cells, letters, memos, and reports. Designed to be the electronic equivalent of 3M's Post-it self-stick notes, the program runs on all IBM-compatible computers and operates with most popular software, including Lotus 1-2-3 (versions 1A and 2), Symphony, Multiplan, WordStar, MultiMate, dBase, and SideKick. The notes cannot be used with computer games and other graphics-oriented software.

New from Touchstone Technology

**The SoftSwitch™**



**Auto-Manual Parallel Printer Switch**

Now you can switch the parallel output of any personal computer to your choice of any two parallel printers, quickly and easily, manually or automatically.

**Practical**

Eliminates cable switching and reduces paper loading and waste. Automatic switching saves more time and reduces the chances of accidentally running the wrong printer. Permits unattended and remote selection. Even in the manual mode, the SoftSwitch offers easy, convenient one-handed operation. Compact case measures just 5x5x1-1/2 inches.

**Adaptable**

The SoftSwitch allows you to select printers by any of four different methods:

1. Printer codes which can be quickly and easily embedded in files of most popular word processors, spreadsheets and databases.
2. Embedded codes immediately following print commands in your own custom software.
3. Manually from the panel-mounted toggle switch.
4. From the keyboard, with our optional RAM-resident software (\$9.95).

**Universal**

The unique circuitry (U.S. Patents Pending) switches ALL active lines

and passes ALL required acknowledgements and status signals, so it is compatible with all personal computers and parallel printers.

**Reliable**

Solidstate switches have no mechanical contacts to fail or maintain. LED indicators always show which printer is selected. The SoftSwitch is backed by a full one-year warranty and the Touchstone unconditional 15-day performance guarantee.

**Economical - Only \$139.95**

Complete with power supply and full instructions, the SoftSwitch is alone in its class. If you wish, you can supply your own cables (You'll need 2x18 connectors to the SoftSwitch). Or, we can supply 5-foot ribbon cables with Centronics-type connectors for just \$17.00 each (add 80 cents per foot for longer cables).

**Call Toll Free  
1-800-828-6968**

In New York: 1-800-462-4891  
International calls: 1-716-235-8358

Circle 278 on Reader Service card.



**TOUCHSTONE  
TECHNOLOGY INC.**  
955 Buffalo Road  
Rochester, NY 14624



# Pickles & Trout

available from  
**TriSoft**

**All your Tandy Model-II, -12, -16, and -6000 CP/M-2.2 and CP/M-68K needs!**

From:  
**TriSoft**  
1825 East 38½ St.  
Austin, Texas 78751  
**1-800-531-5170**  
**(512) 472-0744**

New for  
Profile users

## PROfix \* IV™ RESTRUCTURE & TRANSFER UTILITY

**NEW!** For PROFILE® 4 PLUS **NEW!**  
Model 4—TRSDOS® 6.2

49.95

For PROFILE® III PLUS **ALSO** For PROFILE® PLUS  
Model III/4 **Model III/12**  
LDOS® or TRSDOS® 1.3 **\$89.95**  
**\$49.95**

PROfix allows you to reorganize your data base TO MEET TODAY'S NEEDS, and then moves ALL or SELECTED fields and/or records of existing data into your new file structure.

### \*\*\*FEATURES\*\*\*

- WORKS WITH HARD DISK OR FLOPPY
- CREATE ENTIRELY NEW FILES—selected fields, records
- PROVIDES ARCHIVING—hard disk to floppy
- RE-ARRANGE FIELDS—even across segments
- DROP OR ADD FIELDS
- SHORTEN YOUR FILE—drop unused expansion records
- CHANGE FIELD LENGTHS—R/L justify data
- CHANGE NUMBER OF SEGMENTS
- CREATE SORTED FILE—drop deleted fields
- LITERAL INSERTION—specified fields
- COMPLETE USER MANUAL—with examples

### -TO ORDER-

Send \$49.95 (Model III/4) or \$89.95 (Model III/12)

Plus \$2.50 for Handling and Postage

Check, M.O., VISA/MC or COD

(for charge card, give expiration date, number)

-To- **BLUE RIDGE SOFTWARE**

230 Chesterfield Road

Lynchburg, VA 24502

For phone orders or more information

**Call (804) 239-0574**

\$1.00 off on phone orders!

Virginia residents add 4% sales tax

Most orders filled within 24 hours

(allow 2 weeks for checks to clear)

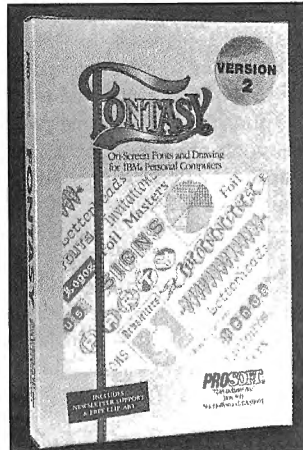
PLEASE SPECIFY VERSION

Profile, TRSDOS are registered trademarks of Tandy Corp.

LDOS is a registered trademark of Logical Systems, Inc. Circle 186 on Reader Service card.



## NEW PRODUCTS



Fontasy 2 includes 300 fonts and 400 pictures.

circuit breaker. Pushbutton switches let you control peripherals individually.

The Guard-It Control Center sells for \$98.95. For further information, contact Ohm/Electronics, 746 Vermont St., Palatine, IL 60067, 800-323-2727 (312-359-6040 in Illinois).

Circle 556 on Reader Service card.

### Born to Run

Concept Omega Corp. announces a complete line of Thoroughbred Software for the Tandy 3000, including the Thoroughbred/OS multi-user operating system. Thoroughbred/OS (\$795) allows users to convert a standard 3000 into a three-user system. In conjunction with the Thoroughbred Multi-Port Expansion Board, it allows the Tandy 3000 to be converted to a six, eight, or 10-user system (\$1,495, \$1,995, and \$2,395, respectively, including the price of the expansion board).

The Thoroughbred line includes accounting (\$695 and up) and office-automation software (\$495 and up), a data-base program (\$695 and up), and productivity tools for single- and multi-user environments (\$495 and up). For more information, contact Concept Omega Corp., P.O. Box 1035, Somerville, NJ 08876, 201-722-9565.

Circle 557 on Reader Service card.

### A New Fontasy

Prosoft announces a second version of its Fontasy graphics program. In addition

to the 28 fonts and on-screen text/drawing features available in the first version, Fontasy 2 includes 60 pieces of small clip-art.

The program allows you to create flyers, signs, newsletters, layouts, and many other printed materials with image graphics. Fontasy gives you a "what you see is what you get" picture. Page size is limited only by memory, not by screen size. You can draw from the keyboard or with a mouse and type directly onto the screen in whatever font you select.

Prosoft has also added more font disks and two clip-art disks to the optional Fontasy library. The program now includes a total of 300 fonts and 400 pictures.

Fontasy requires a minimum of 256K of memory. The retail price for version 2 is \$69.95. Registered owners of version 1 can upgrade for \$25. For more information, contact Prosoft, 7248 Bellaire Ave., North Hollywood, CA 91605, 818-765-4444.

Circle 551 on Reader Service card.

### In Translation

Shannon Associates' Metamorphosis is a utility program that translates any source program from one language to another, including Fortran to Ada, Jovial to Ada, and any language to C. The software documentation includes a comprehensive Fortran-to-Basic translation example.

The utility can also function as a custom compiler, assembler, macro-processor, query-language processor, command-language processor, graphics-language processor, and report generator.

Furthermore, it facilitates the reformatting of data-base files and analysis of natural language, grammar, sequential and parallel procedures, and computational signatures.

The utility sells for \$387. It requires 384K RAM, a monochrome monitor, and two 360K floppy-disk drives. For more information, contact J. H. Shannon Associates Inc., P.O. Box 597, Chapel Hill, NC 27514, 919-929-6863.

Circle 554 on Reader Service card.

# TRS-80

## What Day Is It?

SOTA Computing Systems' Day-by-Day is a calendar/address program for Model 4/4P/4D users. It has a daily calendar scheduler for storing memos, reminders, and time schedules and an address book for keeping names, addresses, and phone numbers.

The calendar provides users with display screens similar to the pages of a monthly calendar. Users can store information in any date and highlight days for which they've scheduled events or jotted reminders. The address book can store as many as 100 names and addresses. Both functions offer a variety of sorting, searching, and printing options.

Day-by-Day's calendar covers the years from 1977-2020 and is written in machine language for speed and

efficiency. The program manual includes tutorial chapters that assist users in extracting full processing power.

The program runs under either TRSDOS 6.2.x or DOS-PLUS 4. It will also work with Radio Shack's Double Duty program. The package costs \$59.95. For more information, contact SOTA Computing Systems Ltd., 213-1080 Broughton St., Vancouver, British Columbia V6G 2A8, 604-688-5009.

Circle 569 on Reader Service card.

## Bone Up

The Home Health Guide is a three-disk software package providing instant access to information about treating 155 health problems typical of infants, children, and adolescents. The program describes common illnesses and recommends preventative and emergency treatments for a variety of medical problems.

The guide is published by Clinical Reference Systems

Inc. and runs on the Models III/4 and on the Tandy 1000/2000. It costs \$19.95 plus \$1.50 for postage and handling.

For more information, contact Home Health Guide, P.O. Box 20308, Denver, CO 80220, 303-399-7089.

Circle 570 on Reader Service card.

## Communication Links

Software Interphase Inc. announces Syslink Version 3, a bulletin-board software package for the Models III and 4. The software contains three public/semi-private message bases, each capable of storing up to 3,000 messages among 30 subsections.

Other standard Syslink features include two-way file transfer with ASCII or XMODEM error-checking protocol, private electronic mail with reply and multiple-send capability, a survey/voting section with statistical analysis, customized terminal settings for each user, and a complete

text editor with global search-and-replace and line-editing capabilities.

System operator (sysop) features include a detailed caller's log with monitoring of all user activity and complete maintenance of a 999-member user base. The system operator also has complete control over each feature in the system and can deny or enable user access to areas of the network.

Syslink costs \$125 and requires a minimum of three floppy drives, a Hayes-compatible modem, and NEW-DOS/80 2.0 or 2.5. It supports baud rates of up to 2,400. A printer is optional for printing reports and system status. Current bulletin-board sysops can receive a \$25 credit toward the purchase of Syslink by sending their original BBS software disks.

For more information, contact Software Interphase Inc., 5 Bradley St., Providence, RI 02908, 401-272-1138.

Circle 568 on Reader Service card.

Circle 485 on Reader Service card.



**POWER PROBLEM?**

The Solution!  
**KALGO** Power Protection Products

TRANSIENT VOLTAGE SURGE SUPPRESSORS  
POWER LINE FILTERS  
STANDBY UNINTERRUPTIBLE POWER SYSTEMS

1-800-524-0400, in PA 215-837-0700  
CALL TODAY FOR FREE LITERATURE

Kalgo Electronics Co., Inc.  
6584 Ruch Road  
Bethlehem, PA 18017

DEALER - OEM  
DISTRIBUTOR  
INQUIRIES INVITED

Circle 250 on Reader Service card. **POP QUIZ**

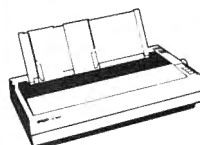
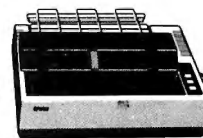
**MARYMAC** INDUSTRIES INC.

**800-231-3680**

**Radio Shack® Tandy®**

**EPSON PRINTERS**

People you Trust to give you the very best!



- Lowest Discount Prices
- Reliable Service
- Quality Products

**"World's Largest Independent Authorized Computer Dealer"**

22511 Katy Fwy., Katy (Houston) Texas 77450  
(713) 392-0747 Telex 774132

## Etc.

**Shock Therapy**

Micostat Portable Pads from Charleswater Products Inc. are work surfaces designed to safely dissipate static charges of up to 5,000 volts in 0.05 seconds.

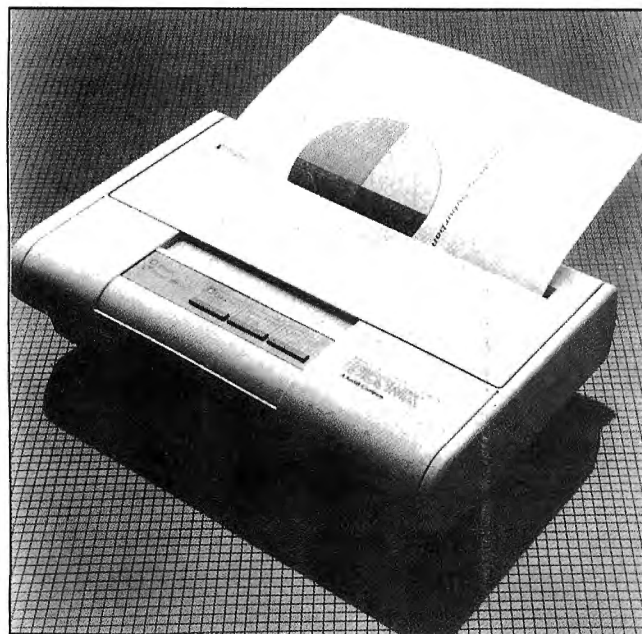
Pads come in seven colors and two sizes—24 by 36 and 24 by 48 inches—and are equipped with a ground cord and dual-snap fastener for attaching conductive wrist straps. They exceed NEMA standards for abrasion resistance and can be used on existing nonconductive workbenches.

Prices start at \$42. For details, contact Charleswater Products Inc., 93 Border St., West Newton, MA 02165, 617-964-8370.

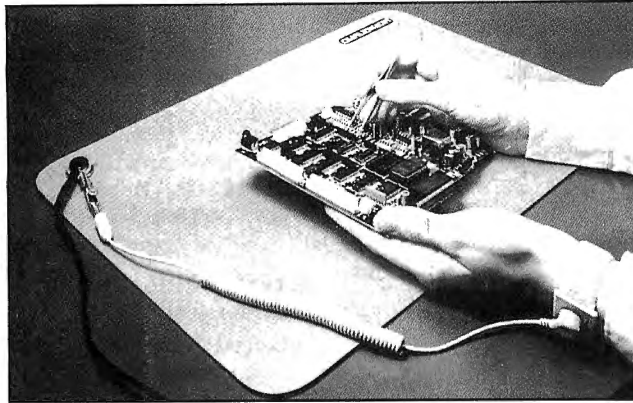
Circle 579 on Reader Service card.

**Compact Printer**

The Diconix 150, a new portable printer from Diconix Inc., is as small as a standard office dictionary. The battery-powered printer weighs less than 4 pounds and prints on single sheets of letterhead or continuous-feed computer paper with near letter quality at speeds as high as 150 characters per second (cps) in draft mode.



Diconix Inc.'s Diconix 150 portable printer.



Micostat's antistatic worksurface.

The printer connects to computers with a Centronics 8-bit parallel interface and is compatible with many word-processing programs. The retail price is \$479.

For more information, contact Diconix Inc., P.O. Box 3100, Dayton, OH 45420, 513-259-3100.

Circle 563 on Reader Service card.

**Easy Drafts**

Star Micronics' NL-10 dot-matrix printer prints high-speed draft quality at 120 characters per second (cps) and near letter quality at 30 cps. The printer features plug-in interface cartridges to ensure compatibility with most personal computers.

Eleven format and print functions are activated by pressing buttons on the print-

er's front panel. Controls include three-print pitch selections, type style, print mode, margin settings, and forward and reverse paper feed.

An adjustable rear tractor feed provides a quick-tear feature that reduces paper waste. The printer can also automatically feed a single sheet of paper into position. It has a bidirectional tractor feed for improved graphics quality.

The NL-10 with one interface cartridge retails for \$379. The base unit retails for \$319; each of the available cartridges costs \$60. For more information, contact Star Micronics Inc., 200 Park Ave., Suite 3510, New York, NY 10166, 212-986-6770.

Circle 571 on Reader Service card.

**Customized Modems**

The uA212A Designer's Kit lets engineers design modems based on Fairchild Semiconductor's uA212A single-chip system, which performs the signal-processing functions of Bell 212A/103-compatible modems.

The kit consists of a modem board containing the chip, microcontroller, Data Access Arrangement, EPROM, RS-232 interface, and dialer, along with full-test and disconnect modes. The board is a 1,200-/300-bit-per-second, full-duplex, stand-alone "smart" board that fully implements the Hayes Smart-modem command set.

A 5¼-inch disk containing microcontroller source-code listings and utilities is included. The documentation explains board features, interface requirements, and

modem architecture, and includes a demonstration program to help designers develop application-specific control firmware.

The uA212A Designer's Kit sells for \$499 in unit quantities. For information, contact Fairchild Advanced Signal Processing Division, 450 National Ave., Mountain View, CA 94043, 415-962-3847.

Circle 578 on Reader Service card.

**Serious About Basic**

TAB Books Inc. has published a new book called *Serious Programming in Basic* for programmers interested in obtaining better performance from their Basic programs. The book's author, Henry Simpson, provides advice and practical guidelines for developing applications programs in Basic.

*Serious Programming in Basic* focuses on the most-used versions of Microsoft Basic. It includes many subroutines and short programs that illustrate the principles of program development.

The book is available in paperback for \$14.45 and hardcover for \$21.95. To order, write to TAB Books Inc., Blue Ridge Summit, PA 17214, 717-794-2191.

Circle 573 on Reader Service card.

**Mastering DOS**

Que Corp. has published *Using PC DOS*, an advanced guide for PC DOS users. The book presents DOS basics for beginners, advanced DOS tips for experienced users, and a DOS command reference that gives quick access to 63 of the most frequently used DOS commands.

*Using PC DOS* costs \$21.95 and is available at most bookstores and computer stores. To order directly from the publisher, call or write Que Corp., 7999 Knue Road, Suite 202, Indianapolis, IN 46250, 317-842-7162.

Circle 574 on Reader Service card.

**Tooling Around**

The JTK-65 Terminal/Printer Maintenance Kit from Jensen Tools Inc. contains a diverse selection of microcomputer repair tools.





*Jensen's Terminal/Printer Maintenance Kit.*

Screwdrivers, nutdrivers, hex keys, files, pliers, cutters, wrenches, and soldering equipment are among the tools provided. You also have a choice between a Fluke Model 77, 8021B DMM, or Triplet 310 VOM meter.

The JTK-65 comes in a zipper case made of vinyl, leather, or Cordura. For information or a free catalog of other tools and kits, contact Jensen Tools Inc., 7815 S. 46th St., Phoenix, AZ 85044, 602-968-6231.

*Circle 577 on Reader Service card.*

### Soft Sell

Software Entrepreneurs in need of marketing advice might find it in a new manual from Associated Technology titled *How to Sell Your TRS-80 Applications Software*. The manual tells how to obtain national directory listings, price a new software product, locate and qualify new advertisers, write a user's manual, and operate a successful mail-order fulfillment service. The manual costs \$22. For more information, contact Associated Technology, Route 2, Box

475, Estill Springs, TN 37330, 615-967-9159.

*Circle 575 on Reader Service card.*

### A Juki Dot-Matrix

Juki Office Machine Corp. has added a dot-matrix printer to its traditional line of letter-quality, daisy-wheel printers. The Juki 5510 prints draft quality at speeds as high as 180 characters per second (cps) and near letter quality at 30 cps. The printer provides 96 ASCII characters, 96 italic characters, and 11 international character sets (eight switch-changeable international character sets). The printer has a user-definable matrix and features several printing modes, including double emphasized. Seven-color printing is available with an optional color kit (\$149).

The printer's bidirectional, logic-seeking system combines a 9-inch platen with assorted printing-width capabilities, including fan-fold, roll, and cut sheet. The 5510 has a 3K buffer memory, which is expandable to 15K.

The Juki 5510 retails for under \$500. For more infor-

mation, contact Juki Office Machine Corp., Printer Division, 20437 S. Western Ave., Torrance, CA 90501, 800-325-6134. (California residents call 800-435-6315.)

*Circle 558 on Reader Service card.*

### Siamese Buffer

Proteus, a parallel double buffer and data switch manufactured by Computer Friends Inc., provides multiple-copy capability and a

buffer on both output ports.

You control the data switch from the front panel, manually, or through software. Both printers can print simultaneously while the computer's memory is free.

Proteus costs \$199 for the 64K version and \$299 for the 256K version. Contact Computer Friends Inc., 6415 SW Canyon Court, Portland, OR 97221, 503-297-2321.

*Circle 576 on Reader Service card.*

## DIFFERENT TRACK



*Computereyes acquires images from a video source.*

### Capturing the Image

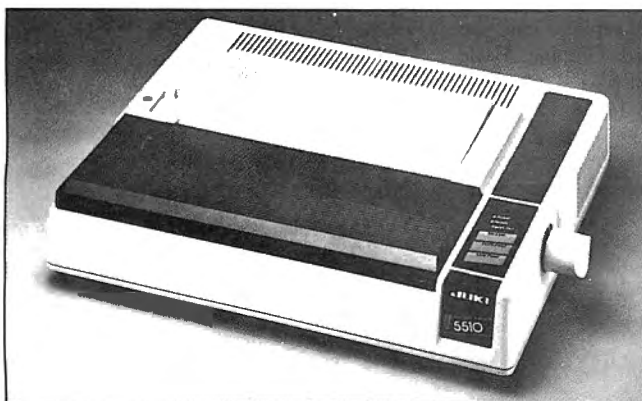
Digital Vision announces Computereyes, a low-cost video-acquisition system for IBM PC and compatible computers. Computereyes is an innovative slow-scan device that can easily connect to any standard video source (such as a video camera, tape recorder, or videodisk). Under software control, a black-and-white image is acquired in under 12 seconds. Two acquisition modes allow capture of either high-contrast images or 16 gray-level images. On-board video switching allows the video-source signal to be previewed on the computer monitor.

Comprehensive software provided with the system includes: machine-language image-capturing routines, automatic calibration of brightness and contrast settings, a menu-driven executive that provides everything needed to capture images, and image save-to-disk capability.

The system currently acquires images on the IBM Color Graphics Adapter; software to support other graphics boards, such as the Enhanced Graphics Adapter (EGA) and Hercules boards, will be available soon.

The Computereyes package includes interface adapter, software support on disk, owner's manual, and one-year warranty. Computereyes sells for \$249.95; for \$529.95, a complete Computereyes system and a high-quality video camera are available. For more details, contact Digital Vision Inc., 14 Oak St., Suite 2, Needham, MA 02192, 617-444-9040.

*Circle 580 on Reader Service card.*



*The Juki 5510 dot-matrix printer.*

# New Products Index

## MS-DOS

### Reader Service Number

| Reader Service Number | Company                          | Page |
|-----------------------|----------------------------------|------|
| 555                   | Brown-Wagh Publishing            | 145  |
| 566                   | COADE                            | 142  |
| 557                   | Concept Omega Corp.              | 146  |
| 562                   | Graham Software Corp.            | 145  |
| 565                   | Interlink Business Network Corp. | 142  |
| 554                   | J. H. Shannon Associates Inc.    | 146  |
| 553                   | Komputerwerk                     | 142  |
| 567                   | Maxi-Switch Co.                  | 142  |
| 556                   | Ohm/Electronics                  | 145  |
| 564                   | PC's Limited                     | 145  |
| 552                   | Personics Corp.                  | 144  |
| 551                   | Prosoft                          | 146  |
| 559                   | RolandCorp US                    | 144  |
| 561                   | Simon & Schuster Software        | 144  |
| 560                   | Zenith Data Systems Corp.        | 142  |

## TRS-80

### Reader Service Number

| Reader Service Number | Company           | Page |
|-----------------------|-------------------|------|
| 570                   | Home Health Guide | 147  |

|     |                             |     |
|-----|-----------------------------|-----|
| 568 | Software Interphase Inc.    | 147 |
| 569 | SOTA Computing Systems Ltd. | 147 |

## Etc.

### Reader Service Number

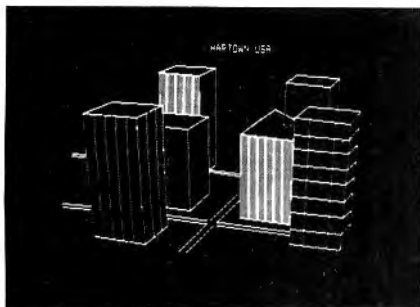
| Reader Service Number | Company                                       | Page |
|-----------------------|---|------|
| 575                   | Associated Technology                         | 149  |
| 579                   | Charleswater Products Inc.                    | 148  |
| 576                   | Computer Friends Inc.                         | 149  |
| 563                   | Diconix Inc.                                  | 148  |
| 580                   | Digital Vision Inc.                           | 149  |
| 578                   | Fairchild Advanced Signal Processing Division | 148  |
| 577                   | Jensen Tools Inc.                             | 148  |
| 558                   | Juki Office Machine Corp.                     | 149  |
| 574                   | Que Corp.                                     | 148  |
| 571                   | Star Micronics Inc.                           | 148  |
| 573                   | TAB Books Inc.                                | 148  |

*New Products listings are based on information supplied in manufacturers' press releases. 80 Micro has not tested or reviewed these products and cannot guarantee any claims.*

Circle 464 on Reader Service card. **POP QUIZ**

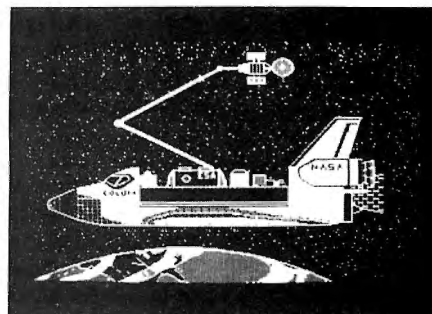
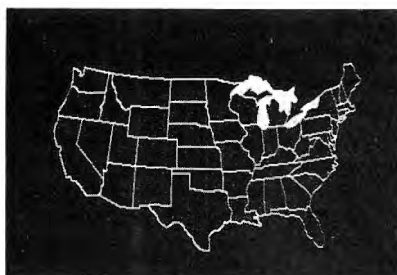
# Grafyx Solution™ Save \$100.00

## Hi-Resolution Graphics for Mod 4/4D/4P/III



**Superior Hardware.** The Grafyx Solution provides 153,600 pixel elements which are arranged in a 640 x 240 or on the Model III a 512 x 192 matrix. Hundreds of new business, personal, engineering, and educational applications are now possible. The hi-res display can be shown on top of the standard display containing text, special characters, and block graphics. This simplifies program debugging, text labeling, and upgrading current programs to use graphics. The Grafyx Solution fits completely within any tape or disk based Model 4, 4D, 4P, or III. Installation is easy with the plug-in, clip-on Grafyx Solution board.

**Superior Basic.** Over 20 commands are added to the Basic language. These commands will set, clear or complement points, lines, boxes, circles, ellipses, or arcs. The hi-res screen can be printed on any of 30 popular printers or saved or loaded to disk without leaving Basic. Areas may be filled in with any of 256 patterns. Sections of the screen may be saved and then put back using any of five logical functions. Labels can be printed in any direction. The viewing area can be changed. The entire screen can be complemented or cleared. Graphics Basic provides dot densities of 640 x 240, 320 x 240, 160 x 240, and 160 x 120, all of which can be used in the same display.



**Superior Software.** The board comes with over 40 programs and files which make it easier to use, serve as practical applications, demonstrate its capabilities, and serve as programming examples. The software works with TRSDOS 1.3, 6.1.2, 6.2; DOSPLUS 3.4, 3.5, 4; LDOS; and Newdos80. The Grafyx Solution is also supported by over 20 optional applications programs: Draw, Bizgraph, xT.CAD, 3D-Plot, Mathplot, Surface Plot, Chess, Slideshow, etc.

The Grafyx Solution package is shipped complete for \$199.95 (reduced from \$299.95). The manual only is \$12. Payment may be by check, Visa/MC, or COD. Domestic shipping is free on pre-paid orders. Texas residents add 5% tax.

**MICRO-LABS, INC.** 214-235-0915  
902 Pinecrest, Richardson, Texas 75080

# THE CLASSIFIED

## 80micro

### BUSINESS OPPORTUNITIES

**Personal Computer Owners** Can Earn \$1000 to \$5000 monthly selling simple services performed by their computer. Work at home in spare time. Get free list of 100 best services to offer. Write: C.I.L.C.S., PO Box 60369, San Diego, CA 92106-8369.

### SOFTWARE

**Profile & pfs:file Users!** PROAID III+/4+ & cws: aid provide many features for reports from single or multiple files. Model III/4's. \$65. Clay Watts Software, 68C North Loop, Cedar Hill, TX 75104. 214-291-1171.

**MS-DOS Users-Free Catalog** of ALPS software products for Tandy 1000, 1200, 2000, 3000, IBM PC, RAMDISK, backup system, 29 different user tools. Call or write today. ALPS, 1502 Country Rd. 25, Box 6100, Woodland Park, CO 80866, 303-687-1442.

**BIBLE SEARCH. Study entire KJV Bible** on disks. Lots of extras. Model III/IV sample disk \$6. Write Scripture Software, Dept. 8M, Box 531131, Orlando, FL 32853.

### HARDWARE

**MODEMS, PRINTERS, TERMINALS.** Distributor pricing to end users and dealers—FREE SHIPPING CALL 1-800-833-2600 for catalog.

### CONVERSION SERVICES

**Media Conversion for Tandy Models** to over 500 systems including Mag-tape, Micro Computers, Mini Computers, Word Processors and Type-setters. Pivar Computing Services, Inc., 165 Arlington Hgts. Rd., Number 80, Buffalo Grove, IL 60089. 312-459-6010.

### COMMUNICATIONS

**MicroServ Online Information Utility.** 812-234-2544. Message center, file transfer, joblist, classifieds, shopping center, downloads, etc.

**Comprehensive Guide to Unusual Online Services.** The weird and bizarre. Find partners online. Find invitation-only services and bulletin boards. \$24.95. Saunders and Pierce Publishing, Box 243, Middle Village, NY 11379.

### HORSE RACING

**\$\$\$WIN with Thoroughbred, Harness, Greyhound Handicapping Software.** . . \$29.95, enhanced. . . \$49.95. Professional Football Handicapping System. . . \$39.95. Free information. Software Exchange, PO Box 5382M, W. Bloomfield, MI 48033. (313) 626-7208.

### MS-DOS

**15 Demonstration Programs—\$6.00.** 800-642-6524.

### PORTABLE PRODUCTS

**PROP LEGS** for your Model 100/200/600. Prop your portable to the correct typing angle. Send \$5.00 per pair, check or money order to: KJM Development, PO Box 698, West Hartford, CT 06107.

### RESULTS

**Thanks very much** for convincing us to run a classified ad in 80 Micro—It's working great! KJM Development, CT.

### COCO SOFTWARE

**Casper CoCo Quick Assembler \$20** 602-268-5077

### LOTTO

**Play Lotto!** Mods I, III, 4 requires 48K (2 drives recommended). Program stores your picks, the winning picks and displays frequency. Specify computer model, state, numbers selected, number of picks. Send \$9.95 to Charles Been POB 8263 Cedar Rapids, Iowa 52408. 319-369-3123

### ADULT SOFTWARE

**Model III/4 Owners. 3 NEW 'ADULTS ONLY' programs.** Details. DEA Data Service, RD #1 Box 1080, Maryland, NY 12116. DEALERS WELCOME!

## THE RS-232

### MODEL III MODEL 4



State of the art technology in board design, our direct replacement of Radio Shack's\* internal RS-232 board, mounts inside the Model III or 4 on the existing brackets. All cables, screws and complete mounting instructions are included. Non-technical people will find that installation is quick, straight forward and simple requiring less than 15 minutes to complete.

Total compatibility with Radio Shack\* and all existing software is maintained. Software programmable baud rates from 50 to 19,200 baud are supported along with programmable word length, stop bits, and parity. May be utilized in either half of full duplex operation.

**Outstanding Value At Only \$69.95**  
Guaranteed One Full Year Dealer Inquiries invited

Please forward payment by a cashier's check or money order. Visa or MasterCard also accepted. Add \$3.00 shipping & handling (Foreign orders quoted on request)

Circle 86 on Reader Service card

**CompuLogic**  
4831 SOUTH HAMPTON RD LB 41  
DALLAS TEXAS 75232  
214/330-1332

# Nonstandard Deviation

I love the language of statistics. When it speaks of "dependent" and "independent populations," I wonder to which I belong—and hope I'm the independent kind. "Intercepts" sound ominous, and "regression" seems counter-productive. "Groups and cases" impress me as stuffy and formal, yet I have to admire the humility of admitting "error." Should a "t-test" be given by a doctor? And what if I fail? But my favorite is a phrase that always brings a grin: "goodness of fit."

The winning statistics programs all had it.

## Mean Machine

By far the most popular statistical fare, beyond means and standard deviation, were linear regression and correlation served with a variety of related side dishes derived from dependent pairs.

David W. Powell (Goshen, IN, by way of Rio Piedras, PR) included the X intercept. While others managed to display more information from the same calculations, David's T-shirt-winning effort gives only the most essential information, but goes further by allowing one-way analysis (ANOVA) of several independent sets and providing the essential results of that, too. He also came up with an easy data-entry device.

David's program (Program Listing 1) first asks how many columns you'll need for data. It then prompts you for the first entries in each column, one at a time, and proceeds through each row in order.

There's no count limit per column, and the counts don't have to be equal. When you get to the end of a column, enter X at the prompt; the program shows you the mean and deviation for that group and eliminates the prompt. You get the overall results after signaling the end of the last column; either the correlation or the ANOVA statistics will be significant, depending on the data that was entered. David's display was among the neatest and easiest to understand that we received.

Also worthy of an 80 Micro T-shirt is the heroic effort of Dr. Donald B. Heckenlively (Hillsdale, MI). Donald sent us eight two-liners; each, while not exactly crammed, was distinctly useful, neat, easy to operate, and linked to a menu driver. Program Listing 2 shows one of Donald's shorter programs that is representative of the quality of his work. I chose it because I'm tickled by the phrase "chi-square for independence"—

and foursquare for freedom!

Finally, an "I Break for 80 Micro" bumper sticker is on its way to Alan R. Patunoff (Shelburne, VT) for his singular treatment of two independent variables in search of a dependent.

## Precisely

When you inform Basic that  $N\# = 3/7$  and instruct it to PRINT N#, you'll see .4285714328289032 displayed. The answer is wrong, but not quite as wrong as when you try to set  $M\# = 7654321/10$  and get 765432.125. Further arithmetic only compounds the errors, as running the two-liner in Program Listing 3 demonstrates. Depending on the input, the final calculation can return as many as four different results.

Have I undermined your faith in computers in general, and in Tandy/Microsoft Basic in particular? Relax. Remember that each time you run the program at least one of its solutions is correct.

Here's this month's challenge of a different kind: What do you do if you must get more than 16 significant digits from a calculation? Write a routine to perform a division that's accurate to 20 decimal places. (If your program will do 20 it will do 200.) I'll give you the first line, which ensures that you only have to work with a positive, proper fraction:

```
0 INPUT "A numerator";N%:INPUT "A denominator";D%:IF N% >= D% OR N% <= 0 OR D% <= 0 THEN 0
```

Your mission is to supply line 1—and if necessary, line 2—but no more than that. It's okay to add DEF and DIM statements before the Input statement in line zero. The program must end by displaying a correctly rounded, 20-place decimal. Good luck, and here are the rules:

1. Write your solution(s) in any TRS-80 or Tandy Basic, except Pocket Computer Basic. We'll consider degree of difficulty when comparing programs created on different machines.
2. This month's entries must reach us by Sept. 15, 1986. Although this doesn't give everyone the same amount of time (we apologize to our overseas readers especially), postponing the deadline longer would add another month to our publishing your solutions.
3. This month's winners will appear in the December 1986 issue.
4. Employees of CW Communications are not eligible.
5. Send your entry to: 80 Micro, Fine Lines, 80 Pine St., Peterborough, NH 03458. We will not, unfortunately, be able to return entries.
6. Specify your T-shirt size. Bumper size is not required. ■

Harry Bee is a freelance writer, puzzle creator, programmer, and dreamer. Contact him at P.O. Box 567, Cornish, ME 04020.

### Program Listing 1. David Powell's multifunction statistics program.

```
1 INPUT" # COLS";N;FORT=1TO2;FORJ=1TON;IFX$(J)<>"X"PRINT"COL"J";# OR X";:INPUTK$;T=K$="X":L=L-T;X$(J)=K$:IFPTHEM=M+S(J)/2/N(J):PRINT" Mn="S(J)/N(J) SD="SQR((Q(J)*N(J)-S(J)^2)/N(J)^2)ELSEK=VAL(K$):N(J)=N(J)+1:S(J)=S(J)+K:Q(J)=Q(J)+K^2:Z=Z-K*U*(J=2):U=K
2 V=X$(J)<>"X":G=G-V;H=H-K*V:I=I-K^2*V;NEXT:PRINT:IFL<>NNEXTELSEC=N(1)*Z-S(1)*S(2):D=N(1)*Q(1)-S(1)^2:B=C/D:PRINT"Corr: A="(S(2)-B*S(1))/N(1)"B="B"r="SQR(C[2]/N(1))*Q(2)-S(2)^2):T=I-H[2/G;E=M-H[2/G:PRINT"ANOVA: F="E*(G-N)/(N-1)/(T-E)" df"s="N-1", "G-N
End
```

### Program Listing 2. Dr. Don Heckenlively's chi-square for independence.

```
2 CLS:INPUT"#Rows";R:INPUT"#Columns";C:N=0:PRINT"DATA:":FORI=1TOR:PRINT"Row"i;FORJ=1TOC:PRINT"Col"j;:INPUT(I,J):N=N+O(I,J):NEXTJ,I:FORI=1TOR:T(I)=0:FORJ=1TOC:T(I)=T(I)+O(I,J):NEXTJ,I:FORJ=1TOC:S(J)=0:FORI=1TOR:S(J)=S(J)+O(I,J):NEXTI,J:CH=0
4 PRINT"Expecteds":FORI=1TOR:PRINT"Row"i:FORJ=1TOC:E=S(J)*T(I)/N:CH=CH+(O(I,J)-E)^2/E:PRINT:;NEXT:PRINT:PRINT"Chi-square ="CH:PRINT,"DF ="(R-1)*(C-1):PRINT:INPUT"CONTINUE";A$:RUN"TLIB"
End
```

### Program Listing 3. 80 Micro's error multiplier.

```
10 INPUT "A number";X$:INPUT "divided by";Y$:PRINT "is either":A%=X%:B%=Y%:C! =X%:D! =Y%:E# =X%:F# =Y%:AB# =A%/B%:CD# =C!/D!:EF# =E#/F#:PRINT AB#"or":PRINT CD#"or":PRINT EF#"and":STR$(X%);"/";RIGHT$(STR$(Y%),LEN(STR$(Y%))-1);"s squared is either":PRINT AB#"CD#"or":PRINT CD#"EF#"or":PRINT EF#"EF#"or":E2# =E#^2:PRINT E2#:PRINT:GOTO 10
End
```

# Dac-Easy Accounting "Best Software Value"



InfoWorld  
1985 "Product of the Year" Awards

## "Trendsetting Accounting Product of the Year"

PC World  
December, 1985

**100,000** and more every day. That's how many smart buyers have already streamlined their accounting with the fastest-selling, most highly praised accounting package ever introduced.

Dac-Easy offers seven full feature accounting modules in a perfectly integrated package, with instant access to:

- General Ledger
- Accounts Receivable
- Accounts Payable
- Forecasting
- Inventory
- Purchase Order
- Billing

You can generate over 300 reports from 80 different routines. And best of all, Dac-Easy Accounting can be used to manage either service- or product-based businesses.

Now the Dac-Easy Series expands with the addition of the widely acclaimed Dac-Easy Payroll and Dac-Easy Word. Dac-Easy Accounting and Payroll are even more powerful and flexible with the company of Dac-Easy Mate and Dac-Easy Port. Also new for 1986 are Dac-Easy Accounting Tutor and Dac-Easy Payroll Tutor.

The best-selling business solution is now complete. Read what the experts say. Compare power, features, ease of use and price. Then join more than 100,000 people who have said "Yes!" to Dac-Easy.

All the Dac-Easy products are non-copy protected, fully documented, and come with a 30-day money back guarantee.

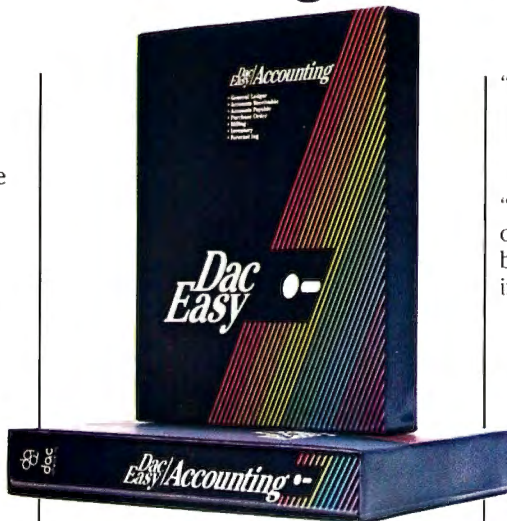
### 30-day money back guarantee

Dac Software offers an unconditional guarantee on all Dac-Easy products (less shipping charges). There is a \$10 restocking fee if the disk seal is broken. This guarantee is available on all products bought directly from Dac Software.

#### Minimum Hardware Requirements:

IBM or other compatibles. 256K memory, two disk drives, MS-DOS, PC-DOS 2.0 or later, 132 column printer in compressed mode, color or monochrome monitor.

MS-DOS is a trademark of MicroSoft Corp. IBM and PC-DOS 2.0 are registered trademarks of International Business Machines Corp.



# \$69.95

**NEW!**

**Dac Easy Payroll \$49.95**

The best in personnel and payroll processing. Automatic tax calculations for all 50 states. Tremendous report features. Multi-departments, after-the-fact payroll, interfaces with Dac-Easy Accounting or can stand alone.

**Dac Easy Word \$49.95**

Powerful, easy and flexible. Includes 70,000 word spell checker, mail merge, windows for up to four documents, cut and paste, search, word-breaking, word count, and much more.

**Dac Easy Mate \$39.95**

The perfect companion to our best-selling accounting and payroll programs. Add the Dac Road Map, calculator, color or intensity selection, macros, print to screen option, and file windowing. Dac-Easy Mate makes your accounting fun.

**Dac Easy Port \$29.95**

A great program that sends your accounting and payroll files to your favorite spreadsheet. Pick from your customer, vendor, chart of account, inventory, or employee files. Select ranges and select individual fields. Fast, easy operation.

**Dac Easy Accounting Tutor \$19.95**

**Dac Easy Payroll Tutor \$19.95**

These two programs make accounting and payroll a snap to learn. Can be used by the beginner or by the current user as a handy, stand-alone supplement to the user's manual.

"Dac-Easy is a genuinely amazing deal."

PC Magazine  
October 15, 1985  
"Editor's Choice"

"I've never before in a review come right out and told readers to buy a product, but I'm doing it now. Dac-Easy is an incredible value."

PC Week  
August 27, 1985

Call toll free or return coupon below today

**1-800-992-7779**

Ask for Operator #754

In Texas or

for more information call

**214-458-0038**

TELEX: 5106000715 dac software

**dac software, inc.**  
4801 Spring Valley Rd., Bldg. 110-B  
Dallas, TX 75244

Please rush me the following products:

| Product             | #Copies | Price   | Total |
|---------------------|---------|---------|-------|
| DAC-EASY ACCOUNTING | _____   | \$69.95 | _____ |
| DAC-EASY PAYROLL    | _____   | \$49.95 | _____ |
| DAC-EASY WORD       | _____   | \$49.95 | _____ |
| DAC-EASY MATE       | _____   | \$39.95 | _____ |
| DAC-EASY PORT       | _____   | \$29.95 | _____ |
| ACCOUNTING TUTOR    | _____   | \$19.95 | _____ |
| PAYROLL TUTOR       | _____   | \$19.95 | _____ |

Add Shipping Charge \_\_\_\_\_ \$7.50

Texas Residents Add Sales Tax (6 1/8%) \_\_\_\_\_

TOTAL \_\_\_\_\_

- Check    Money Order  
 AMEX    VISA    MASTERCARD

Account # \_\_\_\_\_

Expires \_\_\_\_\_

Name \_\_\_\_\_

Company \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Computer brand \_\_\_\_\_

Signature \_\_\_\_\_

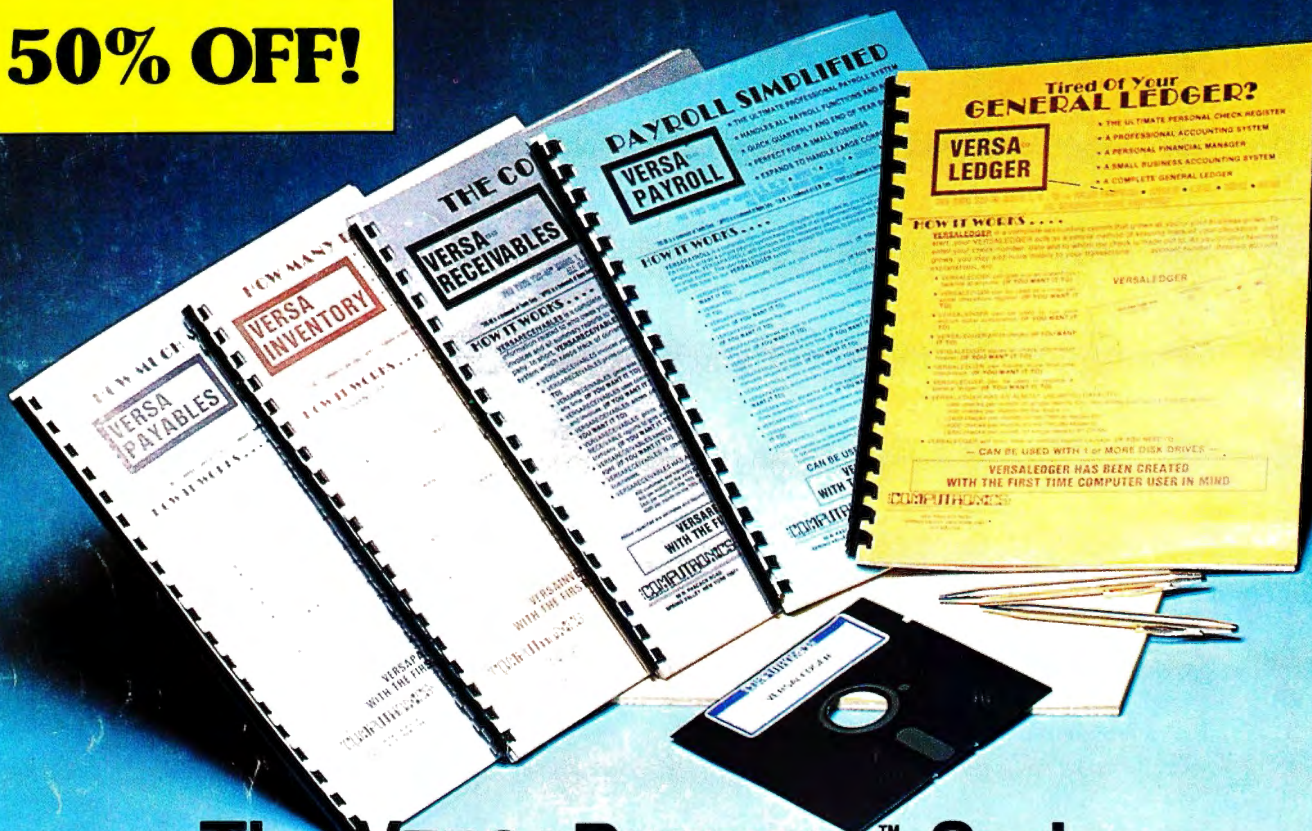
#754

**NOW AVAILABLE FOR TANDY  
1000, 1200, 2000, AND 3000.**

# Introducing the Most Powerful Business Software Ever!

FOR YOUR IBM • APPLE • MAC • TRS-80 • KAYPRO • COMMODORE • MSDOS OR CP/M COMPUTER\*

**50% OFF!**



## The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

### VERSARECEIVABLES™

**\$99.95**

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALLEDGER II™ and VERSAINVENTORY™.

### VERSAPAYABLES™

**\$99.95**

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

### VERSAPAYROLL™

**\$99.95**

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALLEDGER II™ system.

### VERSAINVENTORY™

**\$99.95**

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

### VERSALLEDGER II™

**\$149.95**

VERSALLEDGER II™ is a complete accounting system that grows as your business grows. VERSALLEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALLEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALLEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALLEDGER II™ manual will help you become quickly familiar with VERSALLEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

### FOR TRS-80 MODEL OWNERS ONLY!

TRS-80 owners *only* may now take 50% off our listed price of any module(s) from our VersaBusiness Series. All sales are final (our normal 30-day money back guarantee does not apply to sale items).

#### To Order:

Write or call Toll-free (800) 431-2818  
(N.Y.S. residents call 914-425-1535)

- add \$3 for shipping in UPS areas
- add \$5 to CANADA or MEXICO
- add \$4 for C.O.D. or non-UPS areas
- add proper postage elsewhere

DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

**COMPUTRONICS**

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977