

80micro

5/86

#76

A

80 micro

the #1 magazine for Tandy users

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

ALSO INSIDE:
Dave's MS-DOS Column
MS-DOS New Products
HOT CoCo
Product Reviews
The Next Step

PORTABLE POWER!

Great New Uses For Your Model 100

SO YOU WANT TO BE A PROGRAMMER?

**Ace Bruce Tonkin
Teaches You How
In His New Column**

CLEANING UP MS-DOS

**A Few Good
Batch Files
Go a Long Way**

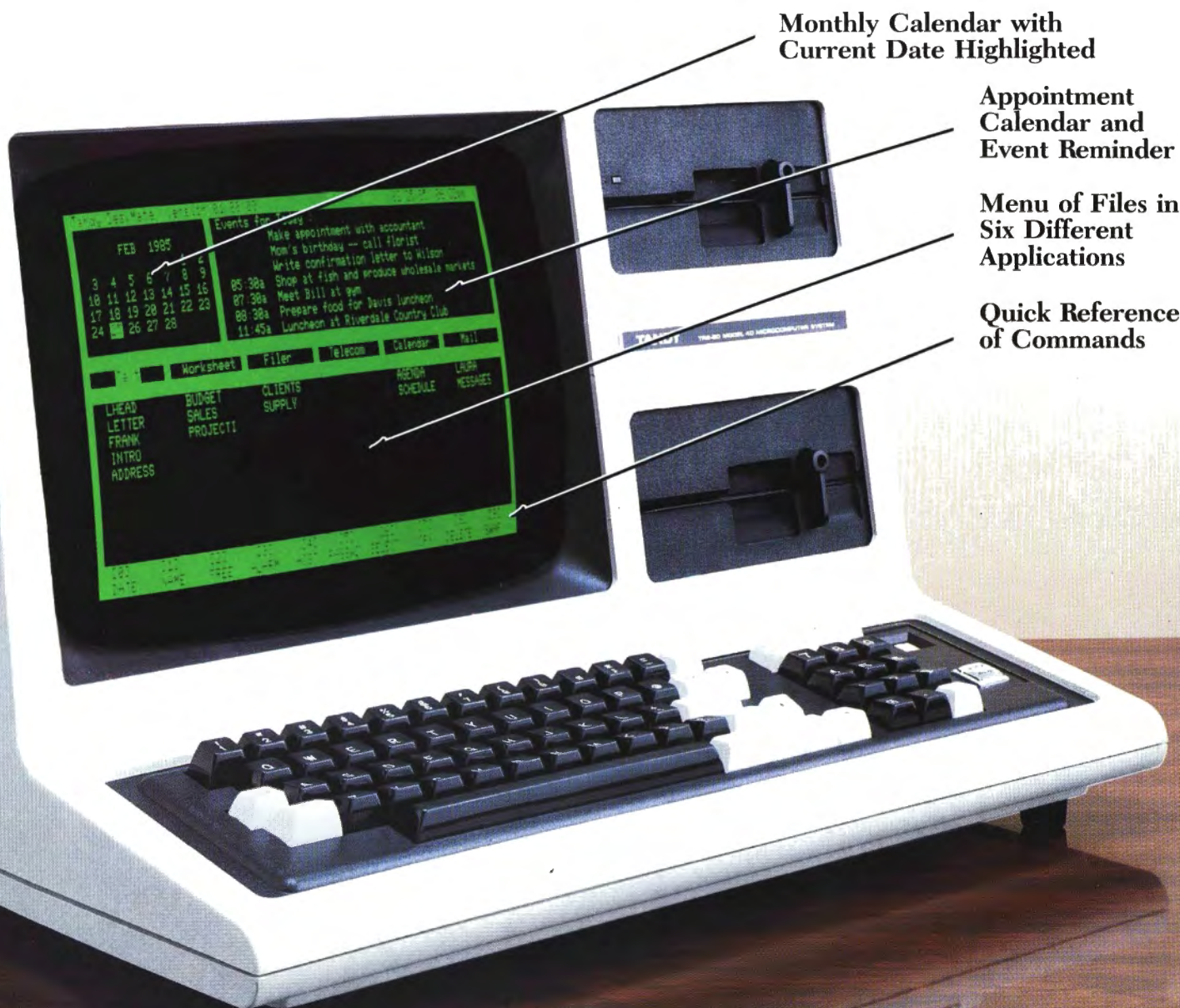
PERSONAL ASSISTANT

**How to Modify
TRSDOS 6
Help Files**



The Tandy Model 4D with DeskMate. Only \$1199.

It runs hundreds of programs...
and your first six are on us.



Monthly Calendar with
Current Date Highlighted

Appointment
Calendar and
Event Reminder

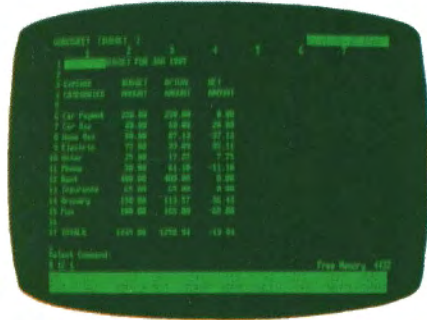
Menu of Files in
Six Different
Applications

Quick Reference
of Commands

Ready to use the minute you put it on your desk

The Tandy Model 4D (#26-1070) is the perfect desktop computer for busy managers, professionals, educators, and home users. The Model 4D even comes with valuable DeskMate software on diskette, featuring the applications today's computer user wants most.

Plus, because a huge software library is available, the Model 4D can be used for forecasting, word processing, database management, education, and for thousands of other applications.



WORKSHEET Lets You Set Up a Budget and Ask "What If . . . ?" Questions

Get the DeskMate® advantage!

DeskMate puts your Model 4D to work right from day one with word processing, spreadsheet analysis, electronic filing, telecommunications and electronic mail. DeskMate is extremely user-friendly, using the same commands throughout the programs. Each day you'll be greeted by a menu that displays a calendar, appointment schedule and a list of your files.

TEXT. Word processing made simple. Control-key editing features make it easy to compose and edit text right on the screen. Then print correction-free copies as often as you wish with an optional printer.

WORKSHEET. This electronic spreadsheet features

"plain-English" entries to make complex calculations. View countless "What if . . . ?" situations in seconds. You can print all or a portion of your spreadsheet. It's perfect for everything from personal finance to marketing.

FILER. Create a name-and-address file, small inventory list, recipe file, and more. Simple commands let you create and find files easily. You can sort files by one or more fields and print your files in any order you wish. Keep all your important information at your finger tips.

TELECOM. By adding a telephone modem, DeskMate lets you communicate with a host computer, information service, or another terminal. Information you receive can be printed or stored on diskette. You can also send files to other computers. TELECOM will even dial the phone number of anyone listed in FILER—at the touch of a key.



TEXT Processing Lets You Compose and Edit Letters and Reports

CALENDAR. Set up an agenda for a month, as well as your daily appointment calendar. Finding, adding, and deleting events is easy. And you can also place events in an alarm file that will sound an alarm through the Model 4D's built-in speaker to remind you of appointments.

MAIL. This program lets you send and receive messages to and from other DeskMate users over the phone (telephone modem required).

Self-contained and expandable

The Model 4D is a stylish, self-contained desktop unit with a 12", built-in 80 x 24 display. The 4D comes with 64K of internal memory, plus two built-in double-sided disk drives for 736K of storage.

The Model 4D features a built-in RS-232C serial interface for communications with other computers or information services (requires modem). A parallel printer interface is also included. And you can expand with more memory, one or more floppy drives, and a hard disk.



FILER Program Lets You Set Up a Handy Name-and-Address File

Come in today!

The Model 4D—a versatile, expandable, all-in-one desktop computer at one low price. Drop by your local Radio Shack store or Computer Center and see it today!

Radio Shack®
The Technology Store™

A DIVISION OF TANDY CORPORATION

Send me a free
Model 4D brochure.

Mail To: Radio Shack, Dept. 86-A-150
300 One Tandy Center, Ft. Worth, TX 76102

Name _____
Company _____
Address _____
City _____
State _____ ZIP _____
Telephone _____

Price applies at Radio Shack Computer Centers and at participating stores and dealers. DeskMate/Registered TM Tandy Corporation.



GREAT PROGRAMS, AND FREE SHIPPING TOO!

Hello again. Thanks for dropping by our cozy little ad! Of specific note this month are the new high res graphics hardware and programs, and also new in our line are Chess, Reversi and an unforgiving game of 3-D Tic-Tac-Toe. These programs will work in ordinary graphics or support a hi-res board if you have one. Plus our usual line of great stuff from all over, of course. And remember, if your printer acts like hungry farm equipment, just give it some tractor feed.

NEW, IN THE JMG LINE UP!

GRAFYX SOLUTION

High-Res graphics on your model III or IV? No problem! Micro Labs' GRAFYX SOLUTION is a plug in, clip on board that will allow your TRS-80 computer to reproduce stunning high-resolution screen graphics. The board comes with over 40 high-res programs, including GBASIC 3.0. Now, the versatility of your machine has increased as you can do business, science and engineering jobs that before just weren't possible. The Grafyx Solution works with all popular DOS's and supports such a wide range of popular printers that, at this price, it is an absolute must for all TRS-80 users.

Models 3, 4, 4P
(List \$199.95) **\$179.50**

BIZGRAPH

This outstanding business graphics package will work on both Micro Labs' Grafyx Solution and the Radio Shack hi-res board with GBASIC 3.0. Choose from line graphs, bar charts, stacked bar charts, pie charts, or a host of others, all in clear high-resolution graphics to show the information that you need to get across. Then save it on disk or print it up and pass it around. Either way, this program will really let you get full use out of your computer.

Model 4/4P
(List \$98.00) **\$94.50**

3-D PLOT

Give your high-res board depth! Three dimensional plotting of surfaces, any surfaces that can be described by an equation of the form $Z = F(X, Y)$, can now be done quickly and easily using Micro Labs' 3-D Plot. Hills, valleys, ripples - you name it! And, you can view your creation from any angle or point in space and can even change your plots' size and perspective. This program offers endless possibilities.

Model 3/4
(List \$39.95) **\$37.50**

DRAW

Draw? Create is more like it! Whether you use cursor control and single key commands or a Mouse Interface, this program will allow you to generate anything from art and engineering drawings to text labels which can be added to pre-generated graphs. You can shift your screen view in any direction or reverse it altogether. Save your creation, or any section of it, separately. Then, print it up and show it off. Draw supports twenty different popular printers!

Model 3/4
(List \$39.95) **\$37.50**

PLUS - THE RETURN OF OLD FAVOURITES!

WORD PROCESSING PACKAGE DEAL

LeScript and Electric Webster together in one functional package. This pair can handle all of your word processing needs.

W.P. PACKAGE
(List \$279.90) **\$199.50**

LE SCRIPT

Great printer support, full Model 4 support and much more! On a 128K Model 4, you can have over 90K of text buffer for use on a single file. Model 4 features available while running in Model III mode. By far LeScript is our most popular program.

Models I/III or 4
(List \$129.95) **\$94.50**

SUPER UTILITY

"The indispensable first-aid kit for the TRS-80 users. . . ." Contains over 60 different utilities for repairing, reviving dead files, reformatting, manipulation of files, and lots more!

Super Utility Plus (Models I & II) **\$59.50**
Super Utility 4/4P **\$69.50**
Super Utility MSDOS **\$79.50**

PRONTO

Specifically designed for the 128K TRS-80 Model 4/4P. Window controller program with many applications. Includes calculator, calendar, a sort utility, terminal facility, address cards, on-line help facility, and much more. "Sidekick" for the Model 4!

Models 4/4P **\$54.50**

ELECTRIC WEBSTER

Includes 50,000 word dictionary. Features fast checking, interactive correcting and personal dictionary expansion. (Specify computer and word processor when ordering).

Electric Webster
Models I/III OR 4
(List \$149.95) **\$129.50**
Grammar Or Hyphenation
Options
(List \$49.95) **Each \$38.50**

SUPERCROSS XT

Designed specifically for transferring data and program files between TRS-80 disks and those of other computers.

Models I/III OR 4 **\$94.50**
With Convert BASIC
Option **\$112.50**

EDAS/PRO-CREATE

One of MisoSys' most popular utilities. Both a Full Screen Text Editor as well as a powerful Macro Assembler. Assembler supports nested macros, includes, and conditionals. Works excellently under most DOS's.

Models I/III and 4 **\$69.50**

T/MAKER

This integrated software package includes everything that you need to help your business or organization run more smoothly. It includes a Word Processor, Spread Sheet, Database, Spelling Checker and much more for one great price! Plus it comes with a tutorial that makes this great bargain easy to learn and operate.

Model 4/4P (List \$299) . . . **\$184.50**
MSDOS Version (List \$450) **\$294.50**

APPLICATIONS/BUSINESS

T-Maker (Model 4/4P)	\$184.50
(MSDOS Ver.)	\$294.50
TFC BBS	\$ 99.50
Powerdot II	\$ 34.50
POWERMAIL PI US	\$ 94.50
POWERMAIL PLUS w/Txt. Merge	\$124.50
LESCRIPT	\$ 94.50
LESCRIPT CP/M	\$149.50
LESCRIPT MS/DOS	\$149.50
ZORLOF II	\$ 49.50
MSCRIPIT	\$ 52.50
LAZYWRITER	\$ 99.50
TYPEITALL	\$ 99.50
PowerScript (New Version)	\$ 34.50
PowerDriver	\$ 24.50
Electric Pencil	\$ 74.50
Electric Pencil w/Spell Check	\$139.50
EDX Text Editor (Mod. I/III)	\$ 24.50
TEXTPRESS	\$ 39.50
ELECTRIC WEBSTER	\$129.50
E.W. Options (Each)	\$ 38.50
E.W. MS/DOS (Includes Options)	\$149.50
Datagraph with Pie Option	\$109.50
Graphit	\$ 34.50
PowerDraw	\$ 34.50
Mumford's Disk Indexer	\$ 34.50
Howe's System Diagnostic	\$ 89.50
J & M's Disk Drive Analyzer - I	\$ 84.50
J & M's Disk Drive Analyzer - III	\$ 74.50
ENBASE Data Base Manager	\$ 64.50
AFM (Auto File Manager)	\$ 94.50
EDIT (Models I/III)	\$ 18.50
Home Accountant (Model III)	\$ 54.50
VersaLedger II (Models I/III)	\$134.50
Versa Series (Models I/III) (Each)	\$ 89.50
TAS's ZMAIL Mail List	\$ 24.50
Macro Typing Tutor	\$ 24.50
Lazycomm Terminal	\$ 29.50
Disk Term Terminal	\$ 59.50
MTERM Smart Terminal	\$ 59.50
DOSPLUS 3.5 (Models I/III)	\$ 54.50
DOSPLUS IVA (Model 4/4P)	\$114.50
Let's Write Music	\$ 47.50

GAMES

SUPREME RULER PLUS	\$ 26.50
FLIGHT SIMULATOR	\$ 29.50
NUCLIX	\$ 14.50
APE	\$ 14.50
SIFTER SHIFTER	\$ 8.50
BATTLE OF ZEIGHTY	\$ 8.50
WARRIORS AND WARLOCKS (D&D Adv.)	\$ 39.50
THE ADVENTURE SYSTEM	\$ 34.50
3-D TIC TAC TOE	\$ 27.50
MICRO-LABS CHESS	\$ 47.50
REVERSI	\$ 37.50

UTILITIES

Alcor C Compiler	\$ 82.50
Alcor Multi-Basic Compiler	\$ 82.50
Super Utility 4/4P	\$ 69.50
Super Utility 3.2	\$ 59.50
Super Utility MSDOS	\$ 79.50
Supercross XT	\$ 94.50
Supercross XT w/CnvBasic	\$112.50
AutoLoader	\$ 34.50
PRONTO (Model 4/4P)	\$ 54.50
Other MISOSYS Utilities (Each)	\$ 28.50
Edas/PRO-CREATE	\$ 69.50
DSMBLR III/PRO-DUCE	\$ 28.50
Edas/Dsmblr Combo	\$ 89.50
DIS' n' DATA I/III	\$ 37.50
DIS' n' DATA (Model 4/4P)	\$ 46.50
TASMON Monitor (Models I/III/4)	\$ 34.50
Howe's Monitor #5	\$ 19.50
CNVBASIC (Models I/III/4)	\$ 27.50
Model 4 TOOLBELT	\$ 39.50
TOOLBOX FOR LDOS	\$ 39.50
TRAKCESS (Mod. I)	\$ 19.50
TRAKCESS (Mod. III)	\$ 24.50
PRO-ESP Utility Set (Model 4/4P)	\$ 28.50
6.2 Plus Enhancements	\$ 36.50
Impakt Utility	\$ 29.50
NEWBASIC w/Analyst	\$ 34.50
Analyst Only	\$ 19.50
ALE - Assembly Language Editor	\$ 39.50
M-ZAL Macro Assembler (Model III)	\$ 79.50
Mumford's Instant Assembler	\$ 44.50
Instant Assembler (Model 4/4P)	\$ 59.50
ZEN Assembler	\$ 34.50
PASCAL 80 Compiler	\$ 59.50
PASCAL 80 for CP/M	\$ 36.50
LC/PRO-LC Compiler	\$114.50
SBE Compiler	\$ 46.50
ACCEL 3/4 Compiler	\$ 44.50
ZBASIC Compiler	\$ 79.50
HartFORTH/PRO-HartFORTH	\$ 69.50
Backrest Utility	\$ 84.50
MULTIDOS Version 1.7	\$ 79.50
MULTIDOS (Model 4/4P)	\$ 89.50

THE BOOKSHELF

Using Super Utility	\$ 14.50
ROM ROUTINES Documented	\$ 16.50
Model III Assembly Language	\$ 15.50
The C Programming Language	\$ 21.50
TRS-80 Disk and Other Mysteries	\$ 16.50
Basic Decoded and Other Mysteries	\$ 23.50
TRSDOS 2.3 Decoded	\$ 23.50
Machine Language Disk I/O	\$ 23.50
The Custom TRS-80	\$ 23.50
How To Do It On the TRS-80	\$ 23.50
Basic Faster and Better	\$ 23.50
BFBLIB or BFBDEM Disks (Each)	\$ 17.50
Basic Disk I/O	\$ 23.50
DFBLOAD Disk	\$ 23.50

INFOCOM

While it is true that our supply of Infocom titles is steadily diminishing, we have a surprise for you . . . We now have a new limited supply of "Hitchhiker's Guide" available! This is definitely first come, first served.

"Standard Level" (Each)	\$ 34.50
PLANETFALL WITNESS HITCHHIKER'S ENCHANTER CUTTHROATS	
"Intermediate Level" (Each)	\$ 39.50
ZORK II ZORK III SORCERER INFIDEL	
"Very Difficult Level" (Each)	\$ 42.50
DEADLINE STARCROSS SUSPENDED	

GBASIC 3.0

GBasic 3.0 is a new enhanced basic from Micro Labs, the people who make one of the best high-resolution boards around. GBasic 3.0 will make your Radio Shack high-res board easier to use than ever before. It uses less memory than other enhanced graphics basics and comes with several new time saving commands. Working under most popular DOS's, the disk also contains 40 graphics programs. The extensive manual includes assembly language entry addresses.

Model 3 or 4
(List \$49.50) \$44.50

AUTO FILE MANAGER

The brand new data base manager from PowerSoft. The key-word of this program is "FLEXIBLE". Free-form entry system allows you to enter your data any way you please. Consists of three modules: AFM (Auto File Manager), AFR (Auto File Reporter), and AFU (Auto File Utility). Features fully sorted output by all fields, fully relational, form letter output, relational lookup, mail labels, and much more. Probably the best Data Base Manager available for the TRS-80!

\$94.50

PROGRAM CONVERSIONS

BASIC 3 TO 4 CONVERT Model 4/4P Only (List \$49.95)	\$39.50
BASIC 4 TO 3 CONVERT Model III (List \$49.95)	\$39.50
BASIC GW CONVERT Model 4/4P Only (List \$99.95)	\$89.50
CONVERT BASIC Models I/III and 4 (List \$29.95)	\$27.50

OUR GUARANTEE!

We sell only top-quality software. If, however you are unsatisfied with a product, you may return it within 10 days (in good condition) for a refund, less \$2.50 handling charge for programs under \$50 (\$5 for programs over \$50). We also ask for a letter stating the reason for your return. We will also beat any competitor's price by \$1.00 (same conditions as competition, ie. shipping charges, etc.) if you tell us where they advertise their price.

TO ORDER:

We accept orders by phone or mail. Specify your TRS-80 Model, exact program(s) wanted, and method of payment. We accept VISA, MasterCard, Check, and Money Orders (C.O.D. orders add \$2.50 and Gov't Purchase Orders add \$5.00). Electric Webster orders please specify Word Processor. Free shipping to continental U.S. and Canada. All prices are in U.S. Funds. Prices subject to change without notice.

ORDERS & INFORMATION

(416) 575-3201

10 a.m. - 7 p.m. Monday to Saturday

JMG

SOFTWARE
INTERNATIONAL

3235 Lockport Road
Niagara Falls,
N.Y. 14305

801 Mohawk Road West
Hamilton, Ontario
Canada L9C 5C2

CATALOGUE: Send for our free Catalogue and Price List.

(416) 575-3201

PowerSoft NewsFlash #7

Thank you for reading our latest installment of PowerSoft's Newsflash. This space will contain information that doesn't really fit into a regular ad-type format. We'd appreciate knowing if these columns are of any value to you. Remember that these columns are written 2-3 months before they are printed, so if something gets out-of-date, that's why, but we try to keep it current! Thanks to all those who have already written or called with your support! For fastest service on a catalog request, DON'T use the Reader's Service Card, but call or write instead! We appreciate receiving your comments as well as your orders! If you are a new computer owner, welcome!

New version of SUPER UTILITY/PC now available!

As of Feb. 25th, the new Version 1.1 of SU/PC has been shipping. All registered owners of the product as of March 14th were mailed a new disk free of charge. If you didn't mail in your card, you may send in your registration card and request the upgrade. Please send your MASTER disk along with \$5 for s/h (U.S.). Only those in the first mailing got a free disk automatically (see, it pays to return your registration card!). New features include a DELETE FILES function, an ANSI mode version as well as the BIOS version, and SU/PC will now co-exist with memory-resident programs. The new version has been fully tested on the TANDY 3000, and is also compatible with the other PC's in Tandy's line including the 2000. (Also with other PC, XT, and AT's).

We've found a neat little monthly TRS-80™ based newsletter that gives you a lot of the news, gossip, stories, and reviews that you may have been looking for. It is called *The Kepner Report*, written and edited by 80-MICRO's own Terry Kepner. I guess 80-MICRO didn't want Terry to mention his newsletter, but they do not compete in any way. Sample issues are available for \$2.95. Their number is (603) 924-9450. A subscription is \$29.95 a year (U.S. - \$51.95 foreign). Reading it reminds me of the old 80-US and early SOFTSIDE days. Lots of BASIC programs to type in too.

CORRECTION - Going back to last month's NEWSFLASH, we'd like to make a correction regarding the product DoubleDOS. This product does not work on the TANDY 1000 as stated unless you are running either PC-DOS or Tandy's 3.1 DOS. The other product mentioned, Disk Optimizer, is OK for the 1000, even with MS-DOS 2.1. We're sorry for the inconvenience. We'll announce 1000 compatibility when available.

Have you gone to Radio Shack™ and picked up your copy of their new Computer Catalog? It has 98 pages of information covering not only the regular catalog items, but ALL the software Tandy distributes through its Third Party Program. Over 600 programs are now listed by category and machine-type, as well as supplier!

We'd like to inform new TRS-80 users about PowerMAIL Plus - the most powerful mailing list program ever written for the TRS-80 computer. This product received a FOUR STAR review in the May '84 issue of 80-MICRO and was a First Place Winner in the '84 Reader's Choice Awards. There's so many new TRS-80 owners out there, that we'd like to remind you about this great product. The price on it was reduced in our latest catalog to only \$99.95! We have versions for the IIII and the Model 4/4P/4D.

Don't forget that PowerSOFT sponsors an Alternative Support Sig on CompuServe™. It is available 24 hours a day for fast on-line question answering, discussion, and suggestions. We also have many files in our database ready for downloading! Our Sig is called the XTRA-80 Sig, and may be reached by typing GO PCS56 from any prompt.

We recently entered into an agreement with a local PC software distributor. What that means to our customers is that we can now supply you with most popular MS-DOS™ based packages. Call us with your needs and we'll give you our best advice and price.

Special Offer for PC/MS-DOS™ Users

Trade in your NORTON UTILITIES™
for Super Utility/PC™!

Send your NORTON Distribution disk to us for a
\$20 credit towards the purchase of SU/PC™!

Offer Expires July 30, 1986 - Don't delay!

** Applies to PREPAID orders only sent direct to PowerSOFT. Include \$3 (U.S.) for S/H **

Norton Utilities is a trademark of Peter Norton Inc. • Super Utility/PC is a trademark of Breeze/QSD, Inc.

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

TRS-80™ is a trademark of the TANDY Corp.

PUBLISHER
Peter Hutchinson

EDITOR-IN-CHIEF
Eric Maloney
MANAGING EDITOR
Penelope Hamblin

SENIOR 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

SALES MANAGER
Peter KJ Montross
SALES REPRESENTATIVE
Michael Wozniak
1-800-441-4403

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

SALES MANAGER
Allsson Walsh

ADVERTISING COORDINATOR
Judy Walker

ADVERTISING SECRETARY
Kelly DeKoning

MARKETING/PROMOTION DIRECTOR
Jane Butterfield



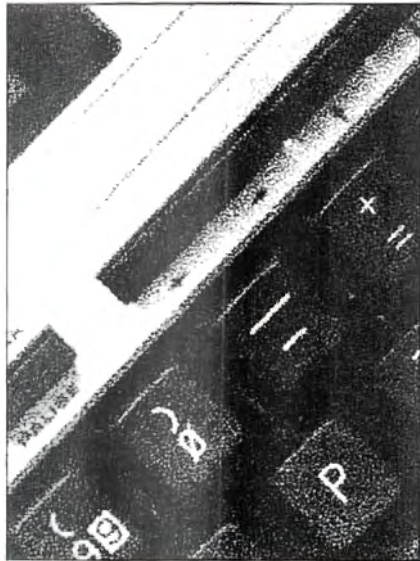
Article submissions from our readers are welcomed and encouraged. Inquiries should be addressed to: Submissions Editor, 80 Pine Street, Peterborough, NH 03458. Include an SASE for a copy of "How to Write for 80 Micro." Payment for accepted articles is made at a rate of approximately \$50 per printed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

80 Micro (ISSN-0744-7666) 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 54

Features

- 34. **The Smartest Peripheral** by *Thomas L. Quindry and John D. Wolfskill*
The Model 100 teams up with the Model 4. (Load 80)
- 48. **Help Yourself** by *Daniel Zenzel*
Do yourself a favor by creating customized help files. (Model 4; Load 80)
- 54. **Step Up to BAT.** by *Renato Reyes*
Hitting it off with MS-DOS batch files. (Model 1000)
- 60. **A Display of Character** by *Roberto Refnetti*
POKE around on the Model 4/4P/4D screen.
- 62. **Counter Intelligence** by *Craig Chaiken*
On the trail of Assembly-language bugs. (Model III; Load 80)
- 82. **Learning GOTO Gracefully** by *Bruce Tonkin*
The first installment of *The Art of Programming* explores the advantages and pitfalls of Basic's GOTO.

Departments

- | | |
|---|--|
| <ul style="list-style-type: none"> 6. Load 80 Directory 12. Side Tracks
by <i>Eric Maloney</i> 14. Input 16. Feedback Loop
by <i>Terry Kepner</i> 21. Pulse Train
by <i>Bradford N. Dixon</i> 25. Reader Forum 27. Reviews
edited by <i>Ryan Davis-Wright</i>
ZBasic
MS-DOS LeScript
The Bread Board
System and the Courier
2400 Modem
PRO-ESP
1dir and Starbridge DOS
Speed Reading Plus 66. Project 80
by <i>Roger C. Alford</i> 76. Dave's MS-DOS Column
by <i>Dave Rowell</i> | <ul style="list-style-type: none"> 80. MS-DOS New Products
edited by <i>Mare-Anne Jarvela</i> 82. The Art of Programming
by <i>Bruce Tonkin</i> 88. The Next Step
by <i>Hardin Brothers</i> 116. Express Checkouts
The Hard Disk Controller and 10-Megabyte Hard Disk System
<i>Using Super Utility + 3.x, Super Utility 4/4P, and Powertool</i>
Webster's New World Spelling Checker 120. HOT CoCo Section
PEEK Performance
Just Write
Natural Selection
Check PPoint
Doctor ASCII
Color Monitor 152. New Products
edited by <i>Mare-Anne Jarvela</i> 160. Fine Lines |
|---|--|



Load 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 instructions 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.

ART DIRECTOR
Anne Fleming

PRODUCTION MANAGER
Dion Owens/Kanner

AD/GRAPHICS PRODUCTION
Gary Clocchi

GRAPHIC SERVICES MANAGER
Dennis Christensen

MANUFACTURING MANAGER
Susan Gross

TYPESETTING SUPERVISOR
Linda P. Canale

PRESIDENT/CEO
James S. Fovee

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

TELEMARKETING MANAGER
Raino Wirein
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 Edward Judice

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 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)*, *Theorem*, and *Distributive*; GERMANY'S *Computerwoche*, *Infowelt*, *PC Welt*, *Computer Business*, and *Run*; 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*, *Mikrodata*, 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 Raino Wirein, Retail Sales Manager, *80 Micro*, Pine St., Peterborough, NH 03458. (800) 343-0728.

Directory

Teamwork

Article: The Smartest Peripheral (p. 34).

Systems: Model 100 with 8K RAM; Model 4 with 64K RAM.

Put the Model 100 to work full-time as an intelligent peripheral for the Model 4.

Language: Basic.

Cassette filespecs: B, XOFF, C, D, E.

Disk filespecs: EXPORT/BA, XOFF/CMD, SIDEPORT/BAS, MSTRIO/BA, CALC/BA.

Helpmate

Article: Help Yourself (p. 48).

System: Model 4, TRSDOS 6.2, 64K RAM.

Create a help file for the Model 4.

Language: Basic.

Cassette filespec: F.

Disk filespec: HELPMATE/BAS.

Trace

Article: Counter Intelligence (p. 62).

System: Model III, 32K RAM, Series 1 editor/assembler.

Track down Assembly-language program bugs.

Cassette filespecs: TRACE (SRC), TRACE (CMD).

Disk filespecs: TRACE/SRC, TRACE/CMD.

Variable Display

Article: The Next Step (p. 88).

System: Model 4, 64K RAM, EDAS editor/assembler.

Display active variables in Model 4 Basic programs.

Cassette filespec: VARS (CMD).

Disk filespecs: VARS/SRC, VARS/FLT.

/BAS, BA = Basic /SRC = source code /CMD, FLT = object code

Circle 378 on Reader Service card.

TANDY IS DANDY...

...until you want more memory

Your Tandy 1000 is a good machine.
A lot of computer for the money.

But you need to add more memory to
get the best performance possible.
Tandy wants a lot of money for that.
Too much money.

Now there's another way to upgrade
your memory. The Zuckerboard
Expansion Memory card. A high
quality, reliable board at a very
reasonable price.

So, if you want to get the most out of
your computer, you have a choice.

You can go to Tandy, and Tandy will
get the most out of you.

Or, you can come to us. We'll fill up
your computer without emptying
your wallet.

Board Configuration	Tandy Memory Plus	Zuckerboard Expansion Memory
with 256K	\$319.95	\$109
with 512K	\$519.90	\$149
Clock Option	\$ 99.95*	\$ 39
Warranty	90 Days *with mouse	2 Years



INTRODUCTORY OFFER

Send the ZUCKERBOARDS I need for my TANDY 1000 right away.

Here's my check or money order

MADE PAYABLE TO A.T.D.

_____ EM with 256K @ \$109 = _____ Subtotal _____

_____ EM with 512K @ \$149 = _____ CA residents

add 7% tax _____

The Doctor pays the shipping. Amount

Enclosed _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE () _____

A.T.D. 1287 Lawrence Station Rd., Sunnyvale, CA 94089

CALL TOLL-FREE TO ORDER

CA (800) 458-6200

(800) 624-4920

Dr. Dr. Zucker



It's another

ZUCKERBOARD



1287 Lawrence Station Road • Sunnyvale, CA 94089 • (408) 734-4631

ZUCKERBOARD is a Trademark of Advanced Transducer Devices, Inc.
Tandy 1000/1200 are Trademarks of Radio Shack, a Division of Tandy Corporation.

PBG200, easy-to-use, menu-driven, produces superior Presentation Graphics on a wide variety of monochrome and color terminals, plotters, and dot matrix printers. **(\$750.00)**

You can produce:

- Pie charts (with explosion)
- Simple vertical bar charts
- Stacked, clustered, 3D bar charts
- Scatter charts
- Line charts

You can read:

- Multiplan SYLK files
- Unity ISIS files
- Comma delimited ASCII text
- TAB delimited ASCII text

PBG300 does all the above and more, including templating (ex: predefining a chart as part of a spread sheet, then making it with one command), word chart printing, and additional device handling and chart-formatting capabilities. **(\$995.00)**

Also, **PBG200** and **PBG300** are available for other Unix/Xenix Machines.

Other Products: Complete product line to boost performance and versatility of

your Tandy 6000, including memory expansion, laser typesetting, project management, and more. Please send coupon for our brochure.

MicroLite Corporation
Dept. M80
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 _____

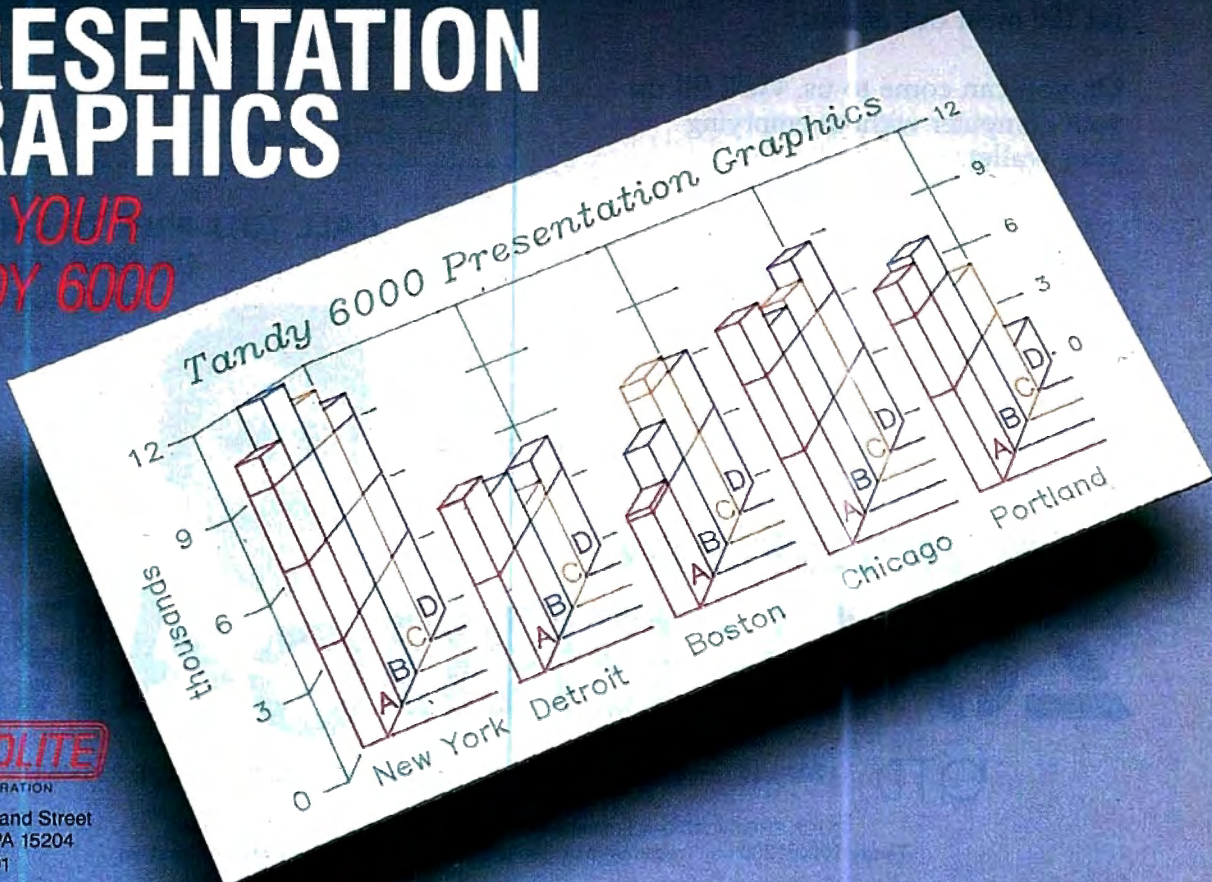
Telephone _____ Ext. _____

System Configuration _____

NEW

PRESENTATION GRAPHICS

FOR YOUR
TANDY 6000



1021 Sutherland Street
Pittsburgh, PA 15204
(412) 771-4901

Circle 346 on Reader Service card.

★ ★ ★ ★ ★
80 MICRO
JUNE, 1985
 Easy to Use ★ ★ ★ ★ ★
 Good Docs ★ ★ ★ ★ ★
 Bug free
 Does the job. ★ ★ ★ ★ ★

CAMEO

ROMAN

Nostalgia

LOMBARDIAN

Pump

celtic

Playbill



OUTLINE

CHAINED

SHADOW

Pretorian

POKER

HANUKAH

Chancery Medium

BACKLITE
BUCKLE

Rotunda

REVBAN

Calligraphy

Old English

INCISED TRAJAN

BELLS

CITY

Mini Cubes

Small Boldface

XMAS

USA

CLIMBING

Small Bold Italics

MOON LITE

WRITERS BROWN

Circle 91 on Reader Service card.

DOTWRITER printed these on an Epson MX-80.

See What You Can Do With DOTWRITER!

DOTWRITER 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?

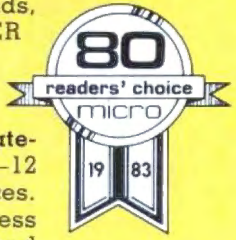
DOTWRITER uses the "bit-image" graphics of your printer to produce the kinds of stunning results shown inside the box. It is a full-function text printing program, so you can inter-mix different character sets, do centering, paragraphs, pagination, magnification, draw horizontal and vertical lines, reversals (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 costs less than \$25 each and you may purchase them at any time.



SIDWAYS SPREADSHEETS

If 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.

Send 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

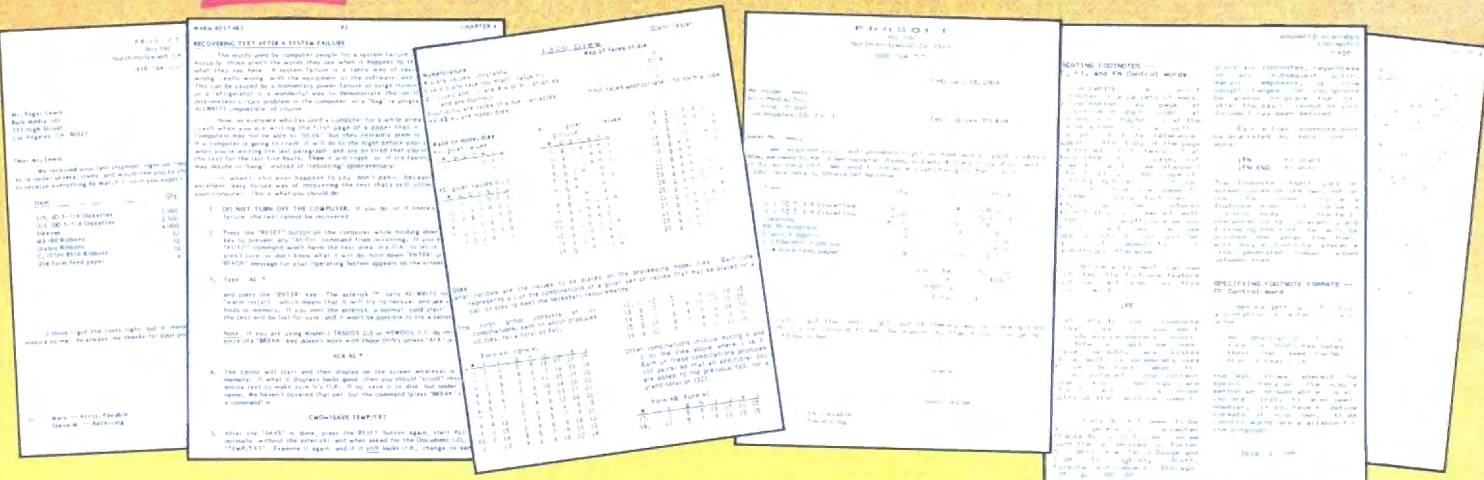
PROSOFT

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.

ALLWRITE™

The Premier Word Processor for Your TRS-80 Model I, III, or 4



These were printed by ALLWRITE; shown 20% actual size.

We are proud to offer you the one Word Processor that will satisfy all your writing needs: ALLWRITE. It sets new standards for text editing and printing, and will give new life to your TRS-80. Let us tell you why...

In an attempt to push the public into expensive 16-bit computers, many manufacturers have been saying that the TRS-80 is obsolete. The truth is that the software, not the hardware, makes the difference. And the best word processor of all is now available *only* on the humble TRS-80, not on those expensive 16-bit machines!

ALLWRITE will save you time and let you produce the highest-quality, most professional-looking letters, term papers, and reports available on a micro-computer.

Allwrite Can Save You Time!

Reads a 25,000 character file (10 printed pages) from disk in SIX SECONDS... does a global search-and-replace in FOUR SECONDS... outruns even the fastest popular micro-printer.

ALLWRITE'S Screen Handling Makes Word Processing Easier Than Ever

Change text width at any time; wide lines shift left and right as you type. ALLWRITE preserves double-blanks between sentences, uses the entire screen for text, and displays a complete Status Screen at the touch of a key. Scroll by line, partial screen, full screen, to top or end of file, or to any marked point. Move cursor by character, word, tab, line, or screen.

You can set and change on-screen tabs and store them on disk. The print-time tabbing features are incredibly versatile: they allow left, right, and centered tabs, and even line up your decimal points.

ALLWRITE shows you where you forgot to turn off underlining, boldface, italics, or double-width. Special on-screen Preview feature shows page breaks and page layouts... including underlining and boldface. In "Summary" mode, ALLWRITE quickly flags formatting errors

without wasting time printing all the text. These standard features make document preparation faster and easier than ever!

State-Of-The-Art File Handling

There is no upper-limit on document size with ALLWRITE, because it chains files *backwards* as well as forwards, even across diskettes. Switch from one chained file to another in less than six seconds by pressing two keys. Select portions of other files for inclusion at print time... great for stock paragraphs.

ALLWRITE salvages text from bad disks! If a sector goes bad, you won't lose the entire file, because it

TAKES FULL ADVANTAGE OF YOUR MODEL 4.

The model 4 version of ALLWRITE uses the entire 80-by-24 screen. On a 64K machine, you can edit **over 34,000 characters** of text. On a 128K machine, you can edit **THREE FILES AT THE SAME TIME!** The second and third files can be over 32,600 characters each, for a total of **almost 100,000 characters** of text in memory.

will skip bad sectors, read the rest of the file, and then show you where the lost text belongs. This advanced error recovery turns a disaster into a feeling of profound relief.

User-Definable Soft Keys Reduce Typing Time

You can store 22 phrases or commands at a time into "soft-keys," then press just two keys to retrieve them. This makes frequently-used phrases and formatting controls a snap to use. You can store these definitions on disk and build a library of hundreds of pre-programmed keys to fit every one of your applications.

Our specially-designed templates fit right on your keyboard to let you see your settings at all times. Each template is also a Reference ("Cue") Card, so it is always right in front of you when you need it, without using up valuable screen space.

ALLWRITE Is Easy To Learn

ALLWRITE's commands and control keys are easy to remember because they use the first letters of common English words: 'CE' stands for 'Center,' 'Search' and 'Replace' do just that, and so forth. The on-line HELP menu offers over fifty screens of topics.

ALLWRITE's superb documentation will get you started quickly. Portions of it are designed for beginners, with every feature clearly explained in step-by-step tutorial style. Since you won't always be a beginner, other parts of the book offer advanced topics. There is a cross-reference summary chapter, a 14-page comprehensive index, and a detailed Table of Contents. We've been developing computer programs and manuals for over 23 years, and understand the importance of good documentation.

ALLWRITE works with all major DOS's on Models 1, 3, and 4/4P.

PROSOFT'S On-Going Customer Support

Perhaps the best reason of all for having ALLWRITE is the continuing support we offer you: friendly, expert, direct support that is unsurpassed in the micro-computer industry.

Note to students: with its Footnote, Table of Contents and Index features, ALLWRITE is ideal for your reports and Term papers.

Note to teachers: ALLWRITE makes it very easy to generate multiple-choice exams and answer keys. Ask for free instructions when ordering.

**"ALLWRITE is a professional system that sets a new standard in word processing. It's powerful and easy to learn and use."
80 MICRO, Nov., 1984**

Customer Comments

"This is the best software package I have ever received . . . superb, easy to use, fast, and has more features than the business word-processor at the office." (E.R.L.)

"Your company and products have to be one of the strongest factors I can think of for keeping me with the TRS-80!" (J.R.H.)

"NEWSSCRIPT is the Cadillac of word processors. ALLWRITE is the Mercedes Benz!" (B.E.)

"... a very readable manual." (D.S.)

BENEFITS OF OWNING

★ ★ ALLWRITE ★ ★

If Word Processing is important to you, PROSOFT's ALLWRITE is the best choice you can make. The clean, professional appearance it adds to your letters and reports will make an excellent impression on people. We will be happy to send you free print samples so that you can see for yourself how good ALLWRITE will make you look.

You probably know that quality word processors for CP/M and the IBM-PC sell for \$300-500, and they don't have ALLWRITE's capabilities or speed . . . or PROSOFT's proven, ongoing support. Now, for a fraction of the cost of a new computer, you can have the most complete word processor of all. And you won't have the headaches of starting all over again with a new, different computer.

HUNDREDS OF USEFUL CAPABILITIES

ALLWRITE comes with just about every useful word processing feature . . . standard. Here are some highlights: excellent right-justified proportional printing on most printers having that ability; powerful Form Letter and Mailing Label preparation; Instant counts of words, characters, lines, changes; block Move, Copy, Delete, Putfile, Getfile, and List; delete by character, word, line, sentence, paragraph, or block; insert and one-key insert; great RS-232 printer support; accepts all 256 ASCII codes from keyboard; intermix pitches on same line (printer-dependent); 1.5 line spacing, 6, 7, 8, 12 lines per inch (printer-dependent); does multiple-columns on all printers; perfect alignment of hanging indents; variables, logic statements, conditional printing; wildcard Directories; integrated with Electric Webster and DOTWRITER for Models I, III, and 4 (these are sold separately); "Legal" line numbering; paragraph, list, and figure numbering; supports most popular printers (all "printer drivers" included); compatible with high-memory drivers; fully explains all DOS and ALLWRITE error messages; wildcard search-replace; tabs, search-replace, other settings remembered across files; word reversal; up to nine levels of boldface; flexible page titles; footnotes at bottom of page or end of document; Table of Contents and Index generation; and PROSOFT's unmatched text formatting and printing capabilities.

How To Order

You can order by phone or mail. For quickest delivery, call our Technical Support line. Please specify your TRS-80 model (I, III, or 4, 48K, at least two disk drives), and your printer(s). Our price includes normal shipping in the U.S. and Canada. The sooner you order, the sooner you will begin to benefit from the ALLWRITE! Word Processor.

Allwrite for the TRS-80

\$199.95

Circle 30 on Reader Service card.

ORDER NOW, TOLL-FREE

(800) 824-7888, oper. 422

PROSOFT

Box 560, No. Hollywood, CA 91603

(818) 764-3131 for Technical Information and Same-Day Processing.

Terms: VISA, MasterCard, checks, C.O.D. California residents please add sales tax. Most orders filled within one day.

The Return of a Rebel

Prepare yourself for a bold adventure in computing. With this issue we begin a new column by Bruce Tonkin called *The Art of Programming*.

Bruce is one of the true iconoclasts in microcomputing today. He does not see good programming merely as a skill but as a political cause.

Take, for instance, this month's installment. It is ostensibly a tutorial on the GOTO statement, but it is also an attack on proponents of so-called structured programming who believe that GOTOs should be outlawed. If you're like me, you'll be as much intrigued by Bruce's opinions on the industry and his craft as you are by his programming techniques.

This is not the first time Bruce's work has appeared in *80 Micro*. In fact, we have a unique and interesting relationship that goes back nearly four years.

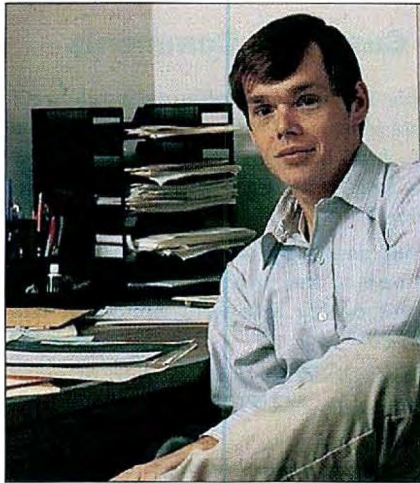
In the summer of 1982, Bruce called us to find out whether we'd be interested in publishing the code to the *Creator*, a \$295 software package that wrote data base programs on the Models I and III. Although the program had received good reviews, Bruce's problems with backers, dealers, and distributors had overwhelmed him to the point of abandoning the microcomputer market altogether. He wanted to put the program in the public domain and use the opportunity to describe his discouraging experiences.

The program so impressed us that we made it the feature of our January 1983 issue, one of only two times we highlighted one article on a cover. We published the code, and Bruce offered the program (along with documentation) for \$11. Bruce also described in detail his experiences in marketing the program and why he was getting out of the business.

The response exceeded everyone's expectations—in a matter of months, Bruce received thousands of orders. Many came with checks for more than the \$11, and hundreds came with notes encouraging Bruce to keep programming. Bruce had no choice but to buy a computer again.

Since then, Bruce has expanded into the PC market, as well as converted the *Creator* to run on the Model 4 and MS-DOS machines. His best-known program is *My Word!*, a \$35 WordStar workalike.

One of the more remarkable aspects of Bruce's work is that he writes everything in Basic (later compiled, of course). He is an avid supporter of everyman's lan-



guage, and his column will reflect his bias.

We're delighted to have Bruce aboard, and we think you will be, too.

Them Changes

The *Art of Programming* is one of two new columns we have planned. The other will focus on public domain software and will premiere in September. You'll get a taste of the column in July, when we feature PD software in our cover story. The article and column will launch a drive by *80 Micro* to put together the most comprehensive library of PD programs in existence. You'll have an opportunity to participate.

Our new columns are replacing several that have been or are being dropped. Spreadsheet Beat and Richard Ramella's Basic Takes ended in April, and June will see the final installment of Roger Alford's Project 80.

We know that many *80 Micro* readers will be disappointed to see Project 80 go. They can rest assured that we will continue to publish hardware construction projects of the same high quality.

We always have a tough time ending a column, since each has its faithful followers. But that's the price we pay for trying something new. Let us know what you think of the changes.

Publication Watch

When I published my list in March of current computer magazines that started up before 1980, I knew I'd overlook someone. Sure enough, Don Williams, publisher of '68' *Micro Journal* in Hixson, TN, wrote to point out that '68' *Micro* brought out its first issue in Feb-

ruary 1979. The magazine covers the 68xx and 68xxx microprocessors.

On a somewhat different note, you should check out the 1986 *Radio Shack Software Reference and Tandy Computer Guide* (RSC-16) at your local Computer Center. The 100-page guide describes some 600 programs available through Tandy's Express Order Software (EOS) service and covers all Tandy and TRS-80 machines. The book does not, of course, include third-party software not on the EOS list, which limits its usefulness somewhat. But the guide is still a valuable collection of information, and Tandy's promotion of third-party vendors is welcome.

And finally, to get off on a really weird tangent, there's a newsletter for MC-10 users (is that the number of the machine, or the number of people who bought one?). It's hard not to mention that cute but forlorn little computer without chuckling a bit, but the *MC-10 Users Group* is quite serious about the information it provides. The 20-page January 1986 issue included a printer utility for the DMP-105, a word processor (!), and the 6803 instruction set. If you're interested, send \$10 to MC-10 Users Group, Box 103, Owensville, IN 47665.

Proof Positive

Every once in a while a reader comes up with a suggestion that is too good to ignore. Willi Wald of Hamilton, Ontario, wrote recently to suggest that we publish a proofreading program to make debugging easier for those of you who type in *80 Micro* program listings. He got the idea from a friend who owns a Commodore 64 and subscribes to our sister publication *Run*, which has such a system.

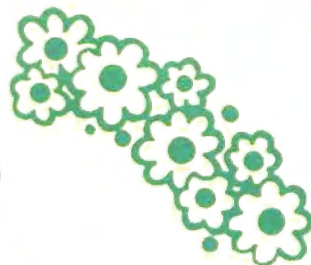
We immediately got tech editor Beve Woodbury working on the project; the result is a little program called Checksum/BAS, which you'll find in our June issue. Here's how it works:

Starting next month, many of our programs will include a checksum value with each line of code. After you type in the listing, run Checksum/BAS, which will produce on screen or paper checksum values for each line number. You simply compare your checksum values with those printed in the magazine. If there's a mismatch, chances are you made a typo in that line.

Thanks, Willi—your contribution has earned you an official *80 Micro* T-shirt. ■



SPRING 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^{95*}

Thousands sold at \$75.90

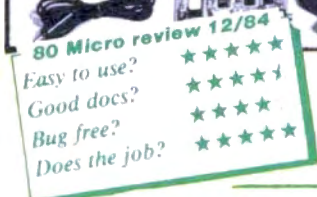
*When purchased with text to speech software.



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



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

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.

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



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

Tandy Reconsidered

1986 will be a dull year for Tandy? [Side Tracks, January 1986, p. 8.] Frankly, 1986 will be an even duller year for Eric Maloney's editorials.

Is Tandy perfect? No, but neither are Big Blue and Apple. Tandy sells second to IBM. In Maloney's opinion, this fact is only a fluke of the universe, and he feels Tandy must continue to shadow the major manufacturers. Let me remind him that a little more than a year ago, Tandy released the Model 2000, using technology IBM wished they had used.

Maloney criticizes Tandy for lagging behind the clones. The clones are the problem. When the IBM PC came out, magazine writers flocked like sheep to hand a *de facto* standard to IBM, which had introduced a computer using five-year-old technology. Computer advancement stopped while the industry climbed on the retail bandwagon.

Maloney accuses Tandy of holding back from introducing new computers. Just what does he think IBM did? Personal computers had been out for more than six years before IBM's computer hit the market.

Ross F. du Clair
Sacramento, CA

In his editorial on whether Tandy can regain its position in the market, Eric Maloney left out the most important aspect of marketing computer systems: people.

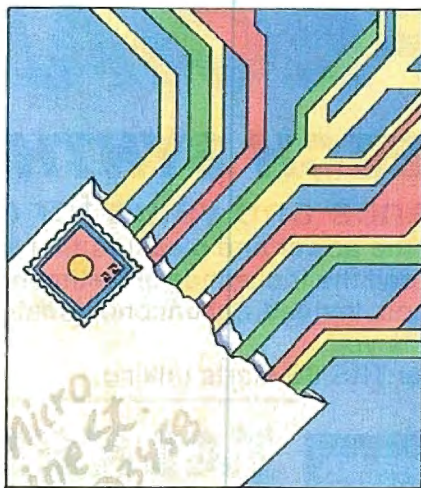
Radio Shack has very dependable equipment, and any small- to medium-size business can be accommodated. Unfortunately, the turnover in marketing personnel is reportedly 92 percent.

I worked for Radio Shack's business products division as a marketing representative in a Computer Center. My reason for leaving? Radio Shack management is insensitive to personnel needs. I could have sold much more equipment if management had allowed me to use a little ingenuity.

If you still believe Radio Shack will come back, I assure you they will fail if management doesn't wake up and see that 92 percent turnover is not conducive to regaining their position in a very competitive market.

The most technologically advanced data processing equipment is useless without people who understand how to operate it. Would you buy a \$15,000 computer system from a battery salesman?

Robert J. Gosnell
San Antonio, TX



The Noble 600?

I'd like to address some points raised in Bradford Dixon's review of the Tandy 600 (March 1986, p. 27). First, Microsoft Works was developed for Tandy, not Zenith as stated in the review. Because of changes we made during development, the 600 was not released until after the Zenith 150 appeared with the same operating system.

The review also states that the 600 comes with "a measly 32K RAM standard." We don't believe that 32K is skimpy when your applications programs are stored in ROM.

Dixon also complains that the 600's liquid-crystal display (LCD) "isn't particularly readable except under the best lighting conditions." Then you'd have to say that the Data General/One's LCD isn't readable at all, when of course it is.

The review states that users can "have all the applications and Basic available by transferring Basic onto a disk." Basic on a disk isn't usable with a 32K machine. That's why we put it in ROM. If you have a 128K machine, you can load Basic from ROM to RAM and run it there, or copy it to disk.

I'm sorry Dixon didn't like the machine more, but that's what makes a horse race! *InfoWorld* called the 600 the "best Tandy laptop," and its reviewer "had no trouble reading the screen on a dimly lit late-night flight." *PC Week's* Jim Seymour said the Tandy 600's LCD was "the sharpest, high-res LCD screen" he'd seen and that we'd proved you could build "an absolute winner without PC compatibility."

Oh, well, we can't win 'em all. Maybe next time.

Ed Juge
Director of market planning
Radio Shack

RAI Explains RAMDrive

Hardin Brothers' review, "RAM Tough: Memory for 8 Bits" (January 1986, p. 34), incorrectly indicates that the publisher of the RAMDrive software is Alpha Technology.

The RAMDrive programs were written and copyrighted by Bentley Mitchell of Security & Software Inc., Houston, TX. Subsequent to Mitchell's death, his estate awarded exclusive license to produce, market and support the RAMDrive software to RAI. Alpha Technology has been only a retail dealer for the software.

The review also mentions a problem in the backup of system files to the RAM-Disk when 128K is reserved for normal operations. We have not encountered a problem here. Upon initial installation, RAMDrive creates a system file. Subsequently, when the RAMDrive program is used after the RAMDisk is established, the system file is automatically backed up into the RAMDisk and system responsibility is transferred. In other words, the RAMDisk becomes drive zero and all other drives' identification numbers are increased by one.

H. Ross Wiant
President, RAI
Hampton, VA

Sorry about the mixup. I meant to say the software was distributed by Alpha Technology, knowing that Ben Mitchell had written the program and the copyright was held separately.

The bug is, unfortunately, still present in the version sent with your letter. To see it, enter:

```
SYSTEM (DRIVE = 4, DRIVER = "RAMDRV44")
Y
0
N
BACKUP /SYS:0 :4 (sys)
```

The system will refuse to perform the backup, giving as an error "Directory slots already in use." But if I issue the same series of commands without reserving the extra 64K, the system files can be backed up to the RAMDrive with no problem.

I have two objections to setting up the RAMDrive as drive zero so the software will automatically transfer the system files to the RAMDrive and create the RDSK file. First, the RDSK file requires 36 grams of space on an already overcrowded boot disk. Second, the RDSK file does not include the /SYS files needed for Debug, SYS5/SYS and SYS9/SYS.

—Hardin Brothers

The Amazing A-BUS



Hobbyists, Engineers, Scientists, OEMs, universities, the A-BUS is for you!

What is the A-BUS? The A-BUS is the best way to connect a variety of **Input** and **Output** cards (such as analog converters, relays, sensors, motor controllers, etc.) to your computer.

A typical **A-BUS** system consists of: • An adapter card and cable to connect your computer to the **A-BUS** standard • The **A-BUS** motherboard, with several slots in which you plug the different Input and Output cards. • Your choice of cards listed below, depending on your application. (Many more cards will be released soon.)

The "A" stands for Amazing, and here is why:

① The **A-BUS** works with any TRS-80 models I, III, 4, 4P, 4D, 1000, even 100, 200 and CoCo. In addition, it will also work with IBM or Apple computers. Should you ever move to another system, your investment is protected. Only the low cost adapter card has to be changed!

② The system is expandable to meet current and future needs easily.

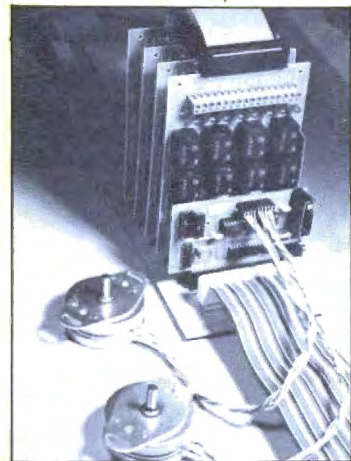
③ Low cost and reliability will ensure your project success.

A-BUS Adapter for Model I Plugs into 40-pin I/O card edge (on KB or E/I) AR-131...\$39

A-BUS Adapter for Models 3,4,4P,4D Plugs into 50-pin I/O bus. AR-132...\$49

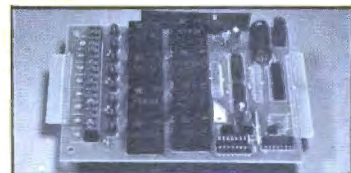
Cable (3 ft.) Computer to **A-BUS** CA-163...\$29

A-BUS Motherboard, for up to 5 cards (not needed if using only one card) MB-120...\$99



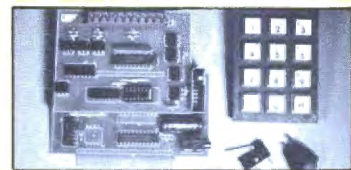
A-BUS **new** Relay Card: RE-140...\$129

This industrial grade output card includes **8 relays**. (Contact rated 2 Amp @ 125V) All the decoding necessary is included which means that you can connect up to 64 cards (which is 512 relays.) Easily controlled using "OUT" commands. For example OUT 0,0 turns all the relays off on card #0. Eight LED's show the states of the relays.



A-BUS **new** Isolated Input Card: IN-141...\$49

This optically isolated input card makes it safe and easy to connect external devices (switches, sensors, thermostats, keypads) to your computer. Simple INP commands read the status of the eight inputs. Full address decoding allows up to 64 input cards (that's 512 channels) per computer.



A-BUS **new** Analog Input card: AD-142...\$119

8 channel 8 bit Analog to Digital converter. Your computer can read voltages, temperatures, pressures, light levels, etc. • Input range: 0 to 5.1 Volts. • Resolution: 20mV. • Conversion time: 120 microseconds. In BASIC, you can take up to 100 readings per second. • Port address: selectable. Up to 64 Analog-80's can be connected to your computer for a total of 512 channels!



A-BUS **new** Dual Stepper Controller: ST-143...\$69

Don't be afraid of stepper motors anymore. The special package (below) includes everything you need to get familiar with steppers: • Controller card drives 2 steppers (12V bidirectional) ST-143...\$69 • Stepper: 48 steps per revolution, up to 300 steps/second. MO-103...\$15 • Power supply PS-126...\$10

Special Package: Controller, two steppers and power supply: PA-181.....\$99



Disk drive extender cable (8")...C160:\$9.95 **Special Cables**

Y-Cable for Mod I bus (40 pin): • X2-40...\$29 • X3-40...\$44 • X4...\$59 • X5...\$74

Y-Cable for Mod 3 & 4 bus (50-pin): • X2-50...\$34 • X3-50...\$49 • X4-50...\$64

Disk drive cable (34 pin): • 2-drive...C162:\$32 • 4-drive...C163:\$45

Our cables are made with high quality gold plated connectors to ensure utmost reliability.



Green Screen.....\$12.50 Printer-Switcher.....\$59

Do your eyes a favor, put on a green screen. Tens of thousands are in use because they work. Contrast is enhanced and eye fatigue is greatly reduced. Our green screen is curved; it fits right on the face of the tube. (Fits Models I,II,III,4,12,16)

A must if you have two printers, plotters, or any devices using the standard parallel printer port. End the hassle of plugging and unplugging cables. You can select either device at the flick of a switch. For Models I,III,4,4P,4D.



ALPHA Products

79-04 Jamaica Ave., Woodhaven, NY 11421

800-221-0916

Orders Only. NY & info call

(718) 296-5916

Hours: 9-5 Eastern Time

Circle 17 on Reader Service card.

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%



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.

Q: I have been looking for a program such as Prosoft's Dotwriter that will work with my 48K Model III and a Radio Shack DMP-120 printer. All advertisements I have seen list compatibility with just about every printer but the DMP-120. Do you know of any software that will allow me to use different letter-sets and fonts with the equipment I have? (Maurice Vose, Wahiawa, HI)

A: The technical people at Prosoft say Dotwriter fully supports the DMP-120 printer. You may call them at 818-764-3131.

Q: I use my Model 4P to develop Fortran programs with the Microsoft compiler sold by Radio Shack. I enter the compiler from TRSDOS Ready by typing in F80, then typing in:

```
FILE1:1,FILE2:1=FILE3:1
```

where File1 is the relocatable file, File2 is the listing file, and File3 is the source file. After compilation, I have to press the break key to exit the compiler. To link the file and create a TRSDOS command file, I type in:

```
L80
FILE1:1
FILE4:1-N-E
```

where File1 is the object file and File4 is the command file. -N tells the computer to save the file, and -E tells it to exit the linker (no break). To shorten the process, I use this job control language (JCL) file:

```
F80 #PRO#:1,#PRO#:1=#PRO#:1
L80 #PRO#:1-N,#PRO#:1-E
//EXIT
```

The first part of the JCL file works properly, but after compilation it aborts for no apparent reason. I think it is because of the automatic exit from the compiler to TRSDOS. Maybe the compiler (F80) is sending a break code that aborts the JCL file. Could you tell me how to avoid this? (Salathiel Pineda, Pasadena, TX)

A: I believe the problem is that the assembler is not returning to DOS as the JCL file expects. Instead, it is interfering with the JCL by overwriting something in memory. I suggest that you terminate the F80 line with a break using the JCL substitution field and Assign command. Beyond that, I'm not sure. Can anyone else help?

Q: I have a Model 4 that I converted from cassette to disk operation. I've noticed references in several articles



to the Model 4's internal speaker, which I don't seem to have. I would like to install one in my unit. Can you help me on this? (Gene Fowkes, Tempe, AZ)

A: A speaker should be installed beside the keyboard as a standard feature on all Model 4's, cassette or disk based. To test your computer's sound generating circuitry, boot up TRSDOS 6.2 and type in:

```
SET *DU CLICK/FLT
```

and press the enter key. Then type in:

```
FILTER *KI *DU
```

Now, each time you press a key, the speaker should make a clicking sound. You can find more information about addressing the sound generator in Tandy's Model 4 technical manual, which you can get from your local Radio Shack store.

Q: I want to upgrade my 16K cassette-based Model 4 to a real Model 4 with two internal drives and as much memory as it will take. Can I do it myself? I have both technical manuals. Where do I go from here? Also, can I keep the cassette capabilities? (Linda Gonzalez, Oak Forest, IL)

A: Yes, you can upgrade the Model 4 yourself. First, remove the 16K chips from their sockets. Next, clip out the capacitors beside the sockets labeled C68-C96. Change the jumpers to the specifications E2-E3, E4-E5, and E11-E12, and add jumper E7-E8 (with the exception of the last one, the jumpers are connected to other positions for 16K chips). The jumpers remove the 12-volt line from the chip sockets so the new 64K chips, which need only a 5-volt line, aren't zapped by the 12-volt line when you turn on the computer.

Put eight 64K chips in the empty 16K sockets, and put eight more in the row of sockets beside them (giving your computer two 64K banks, for a total of 128K). Finally, remove the dual in-line package (DIP) shunt from its socket and plug in

the program array logic (PAL) chip, which tells the central processor unit (CPU) how to address the upper bank of 64K. The PAL chip is available through Radio Shack National Parts (Radio Shack, National Parts Division, 900 E. Northside Drive, Fort Worth, TX, 76102, 817-870-5662).

As for adding the drives, your best bet is to buy an upgrade kit. Check the ads in 80 Micro—I've always liked Aerocomp.

Unfortunately, TRSDOS 6.2 doesn't support the cassette port, except for transferring data to disk. But other disk operating systems, such as MULTIDOS from Alphabit Communications, do offer tape support. Since you will be buying your DOS independent of Tandy, I suggest you spend some time checking up on the different DOSes to find the one that suits your needs.

Q: As you know, there is very little storage space on a Model 4 system disk. Can I safely remove any system files (other than System 13) from my disks to make more usable space? Do you know where I can obtain a list of exactly what each Model 4 system file does?

Also, I want to buy an editor/assembler—which package is used most commonly? As a novice, I want to make as few changes as possible. (Fred Mass, Garnerville, NY)

A: Okay, here goes. SYS0/SYS, which is not an overlay, contains the resident part of the operating system. Any disk used to boot the system must contain this file. You can remove it from data disks.

SYS1/SYS contains the command interpreter, the routines for processing the File Extension system vector, the File Specification vector, and the routines for processing the parameters vector. It must be on all booting disks.

SYS2/SYS is used for opening or initializing disk files and logical devices. It must be on all system disks.

SYS3/SYS's routines close files and logical devices, and get file names from the directory. It must be on a system disk.

SYS4/SYS contains the system error dictionary of messages such as "Disk full" or "GAT read error." Removing it from a system disk is not recommended; it occupies only one granule, and without it, all errors will be reported simply as "SYS error."

SYS5/SYS is used by Debug and can be eliminated if you aren't going to use that utility.

SYS6/SYS contains all the routines that service the library commands in Library A, including the primary library functions (Append, CAT, CLS, Copy, Device, DIR, Filter, LIB, Link, List, Load, Memory, Re-

movc, Rename, Reset, Route, Run, Set, TOF). Eliminating it from your system disk severely limits TRSDOS.

SYS7/SYS contains the routines that service the library commands in Library B, including the secondary library functions (ATTRIB, Auto, Build, Create, Date, Debug, Dump, Free, Purge, Time, Verify). If you don't need the extended functions in this overlay, it can be removed from system disks.

SYS8/SYS dynamically allocates file space during disk writes and must be on system disks.

SYS9/SYS contains the routines for extended Debug commands and can be removed from your system disk. If you purge **SYS5/SYS**, then you might as well purge **SYS9/SYS** because it won't work anyway.

SYS10/SYS contains the routines needed to kill a file and should remain on your system disk.

SYS11/SYS is needed for JCL (job control language) execution. If you aren't going to use JCL, this overlay can be removed from your system disk. If you've removed **SYS6/SYS**, remove this one as well.

SYS12/SYS reads the directory into RAM for viewing and is used by many applications programs. You should keep this overlay on your system disk.

The only way to remove these system files is via the Purge command (which you can use only before removing **SYS7/SYS**).

As for editor/assemblers, I recommend **M-ZAL** from Computer Applications Unlimited. While it isn't used by a great number of people, it can read a variety of other assemblers' source code files without choking.

Q Where can I get a good expansion interface for my 16K, Level II, Model I? (Neal Hanzlik, Rialto, CA)

A Most third-party suppliers of Model I expansion interfaces have dropped out of the market. I don't know of any that are left. If a reader has an expansion interface he or she wishes to sell, please contact Neal Hanzlik at 740 S. Palm, Rialto, CA, 92376.

Q Is there an owner's manual for the Tandy DW-II that has codes not listed in the paper brochure that comes with the printer? Someone from the local Radio Shack Computer Center told me I'd have to buy Scripsit if I want to do upfeeding for columns. (P. Power, Elgin, IL)

A The National Parts Division (see the address on p. 16) supplies two DW-II printer manuals to Radio Shack stores and repair centers: The user manual packed with the printer and the technical support manual that has

cleaning and repair instructions.

The user manual tells you how to set up and maintain the printer, and lists all the codes the printer can execute. As far as I know, the DW-II printer codes have remained unchanged from the first unit to the latest, so you needn't worry about the manual lacking codes.

Q Can you refer me to a good graphics manual so I can improve my programming for teaching with a computer such as the Model III? (Tudor A. Randell, Columbia, MD)

A The books at Radio Shack dealing with the Models I and III are your best bet. Most Model I/III books marketed outside Tandy's distribution are no longer available. Any suggestions from readers?

Q I noted with interest the letter from Bob Klalm of Sylvania, OH (Feedback Loop, October 1985, p. 16). For some time, I have been interested in using 4164s to replace the 4116 chips in my Model I. Since I have an expansion interface that uses no internal RAM (Holmc's), I believe such a modification would be worthwhile. Do you have any ideas on how to accomplish the upgrade? (St Hawk, Sand Springs, OK)

A You'll have to contact Bob Klalm directly for that information, since I don't have room here to cover the modification in detail. His address is 5748 Acres Road, Sylvania, OH, 43560. Good luck.

Q You can run IBM programs on the Tandy 1000, but will the Models III and 4 ever have that capability? Also, I have upgraded my III to 4 with 128K. Can I add another 128K to it, and if so, will Model 4 VisiCalc utilize it? (Ron, Greensboro, NC)

A The Model 4 can run Model III programs in its Model III mode, but neither machine can run MS-DOS or CP/M programs. MS-DOS is designed to use the 8086 family of CPUs while the TRS-80 Models I/II/III/4 use the Z80 CPU. The 8086 family is designed to operate with a 24-bit data bus capable of addressing 640K of RAM. The Z80 family uses a 16-bit data bus capable of addressing only 64K of RAM. The machine code instructions used by the two chips are totally different.

Basic programs, on the other hand, can usually be transferred between the two families of computers and modified to run on both. This is because Basic is a high-level language that never directly uses machine code (PEEK and POKE commands will cause difficulties in transporting programs).

The caveat here is that each computer

has its own dialect of Basic. For example, the MS-DOS machines have Basic graphics commands missing from Model I/II/III/4 Basics. Transporting a program from an MS-DOS machine to a TRSDOS machine requires removing all the MS-DOS graphics commands.

If you are interested in transporting files between the TRSDOS and MS-DOS environments, you might want to contact PowerSoft (17060 Dallas Parkway, Suite 114, Dallas, TX 75248, 214-733-4475) about their SuperCross/XT utility.

You won't be able to add the extra 128K of memory because your program will be unable to use it. The extra 128K is accessible only as banked memory on a data storage disk.

Q I recently upgraded my Model 4 to 128K operation. When I run LeScript, free memory shows as 90,112 characters, which leads me to believe I should be operating with 128K. However, when I try to use Memdisk in bank 1 or bank 2 or both, I get the following message: "Verify error in bank 1 at location X'8000'. Memdisk not present. installation aborted." Could this be due to a faulty chip in the additional 64K of RAM? Memdisk works OK in the primary memory. (C.W. Preble, Mill Valley, CA)

A You probably have a loose or bad chip in the upper bank, as you guessed. I suggest that you take the computer to Radio Shack and have them give it a memory test to locate the chip and replace it.

Q I have been looking for a workable screen dump utility for years, and finally found it in Bob Keegan's listing in the November 1985 Feedback Loop (p. 16).

I had always wanted to print out the graphs created by Richard Foley's Graph-It program ("The Ups and Downs of Graphs," November 1981, p. 176) but had no luck with any other screen dump utility.

I have a Star Micronics Gemini 10, and assuming considerable compatibility between the Epson and the Gemini, I appended Mr. Keegan's utility to Graph-It. The printout worked well with the graphics, but text was printed only on the first pass. After several attempts at reworking the utility, I concluded that lines 995 and 996 printed text. I further concluded that the utility needed to get to line 995 after each graphics print pass. I changed the LPRINT in line 994 to GOSUB 995, and success!

I added Mr. Keegan's utility as a GOSUB accessed by a seventh function in lines 7600 and 7650 of Graph-It, changed the 6 in line 7600 to a 7, and added the screen dump line numbers

(such as 20990-20996). Then, I added 20990 at the end of line 7650. After printing (it was admittedly slow, but worked well), the program returned to line 7655 and subsequently to 7500.

My Gemini DIP switches were set as follows: 1-ON, 2-OFF, 3-OFF, 4-ON. (Thomas E. Degen, Irving, TX)

A: Thanks for the report.

Q: I recently upgraded a group of Model III Basic programs to Model 4 Basic and MS-DOS Basic. These programs ran well under Model III Basic, but after conversion, string compression time soared in the newer Basics, more than doubling the run time.

I've since been searching unsuccessfully for a Trashman-like utility for Model 4 Basic, MS-DOS Basic, or both. Prosoft said they don't plan to produce one. Can you help? (Ted C. Earle, Tucson, AZ)

A: I'm not aware of any programs that do that for MS-DOS Basic. Can anyone else help? Have you considered getting a Basic compiler?

Q: If Frans de Jong hasn't yet found the Model 4's lines-printed count (Feedback Loop, September 1985, p. 17), he can get it at location 1001 hexadecimal (4007 decimal). I had the same problem he did: wanting to put a heading on each page of a printout. It may not have been the professional way, but I used Debug to display blocks of memory and printed a line each time. You can watch the count change at that location. I think this "brute force" method was less time-consuming than *GETMOD. In any event, that's the location with the Forms Filter installed.

On my working disks with Basic programs, I used the *DO command to install the filter, set parameters, and go to Basic with memory at 63,999 (for USR routines). I suppose under different conditions the filter might be located elsewhere, but this at least might help. (George L. Dunsen, Rochelle Park, NJ)

A: At the very least, it gives us a starting point. Thanks for writing.

Q: I'm writing in response to William Kirksey's question in the August 1985 Feedback Loop (p. 14) concerning Radio Shack's MicroChess program. I have succeeded in transferring the game to disk using TRSDOS 1.3's Tape command.

From TRSDOS Ready, type in TAPE (S=T,D=D). When the computer prompts you with "Cass?," press L for 300 baud. The next prompt is "Press any key when cassette ready." The rest of the transfer is automatic. The file will

be saved to disk as Chess/CMD. To play chess, type in CHESS (no CMD) from the TRSDOS Ready.

After the game is on disk, you can change the IQ default to level 3 (instead of the usual 2) with this patch:

```
PATCH CHESS/CMD (ADD = 8E55, FND = 32,
CHG = 33)
```

For level 1, change the 33 to 30 in the patch. (James A. Carrier, Greensboro, NC)

A: This seems to be the simplest method yet for getting that pesky program on disk. Thanks.

Q: I use a vintage Model I with an IBM 725 ASCII Selectric printer. I would like to eliminate the Model I and use the printer with my two-drive Model III, but interfacing is difficult.

The Model I uses a 40-pin connector, while the Model III uses a 32-pin connector. How can I wire the 32-pin to the 40-pin connector on the Selectric interface board? (Frank Blanchette, Dracut, MA)

A: Both models use 34-pin edge-card connections for parallel printers and 40-pin edge-card connections for input/output (I/O) expansion bus ports. If the Selectric is connected to the Model I I/O bus (the connector closest to the front of the expansion interface on the left side), you must be either loading a machine-language file that routes printer information to the Selectric, or using a "black box" that intercepts information on the Model I bus and sends it to the Selectric.

The "black box" and machine-language programs would have to be rewritten for the Model III. Any suggestions from readers?

Q: I want to keep certain programs confidential by adding a security code to them, but anyone who knows about computers can simply push the break key on my 16K Model 4, list the program, and discover the code. Is there any way to disable the break key in Basic, and if not, what are the alternatives? (Mike Grommet, Jonesboro, AR)

A: No program is safe from the truly dedicated thief. Even with the break key disabled, all he or she has to do is press Reset and the program comes up in Basic ready to be listed.

Q: I've never been able to get Super Utility Plus 2.2 to run on my 48K Model III (two disk drives) even though PowerSoft has replaced my disks many times.

Kim Watt's loader uses the EXX command to preserve the registers when it enters the disk access subroutine. There is a vital byte count in the B register that

gets saved in the B' register. A command to the disk controller resets the high byte (7) in the B' register, in effect subtracting 80 hexadecimal from the counter. When the count reaches zero, the loader expects to find the header of a load block that isn't there.

I have been unable to track down the command that produces this unhappy side effect. I think I have a subtle hardware bug that took four years to detect. I've heard of programs to test the central processing unit (CPU), some in the public domain, but I've never seen any published. Do you know of any for the Model III? Are they thorough enough to spot the fault I have described?

Also, where can I get 3½-inch drives for the TRS-80?

Finally, my display has dark lines that slant down to the right and move up or down the screen. I wonder if the problem has to do with line voltage. I've been running the computer on 220 volts/50 hertz using a transformer to reduce voltage to 110 volts ac. Would a radio frequency interference (RFI) filter help? (Roger A. Merritt, Phanat Nikhom, Chon Buri, Thailand)

A: I don't know of any programs to test the Model III CPU itself. Does anyone else have a lead?

The 3½-inch drives are supposed to be plug-compatible with 5¼-inch drives, but they aren't practical without a DOS that can access their double-sided, double-density capabilities. Aerocomp (Redbird Airport, Bldg. 8, P.O. Box 24829, Dallas, TX, 75224, 800-527-3582 or 214-339-8324) has 3½-inch drives for the Model I, III, 4 and Color Computer. Prices start at \$159.

Upgrading a Model III to a Model 4 is very expensive and involves replacing the CPU board, which you can order from Radio Shack's National Parts Division (900 E. Northside Drive, Fort Worth, TX, 76102, 817-870-5662). Make sure you ask for the installation instructions. You may find it easier to buy a used Model 4 (there are some around) or order one from a Tandy dealer in Australia.

As far as the display problem goes, you are picking up line voltage RFI from nearby devices (generally within three to four telephone spans of your home). Neon bulbs, such as those used in stereos, can cause this problem, as can light dimmer switches, microwave lights, and other small electrical devices. Putting RFI filters on the power supply might help. ■

Terry Kepner, a freelance writer and programmer, writes monthly columns for Pico Magazine and 80 Micro and is editor of The Kepner Letter. He's been writing about microcomputers since 1979.

Did you know? Only one spelling checker:

- works with both Scripsit and Superscripsit.
- 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.

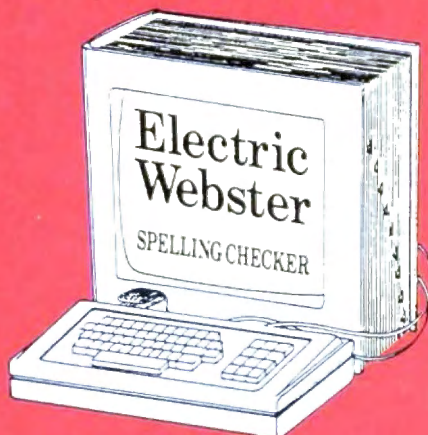
50,000 Word Dictionary: Uses only 2½ bytes per word; add as many words as you wish.

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, Newsprint, Lazy Writer, Superscripsit, 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." *CIN-TUG, 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:

For 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.

Cornucopia Software

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



Software of the Future, Inc.
Box 531650 Grand Prairie, Texas 75053

1-800-433-5355

Texas 214/264-2626

Circle 76 on Reader Service card.



Now in use by thousands
of satisfied customers
all over the world!

The Producer

Professional Program Writer

Create custom programs
to manage mail lists,
records, catalogs, inventory,
loan calculations, schedules.
The only limit
is your imagination.

Save money. Why buy expensive
yet ineffective data base programs
when you can create your own
custom programs using The
Producer. Investing in The
Producer is money saved over and
over again.

Save frustration. No more
dependence on canned programs
that don't quite meet your needs.
You now can produce just what
you want, without any previous
programming experience. The
Producer writes all that complex
code for you.

Save time. What formerly was
impossible for novices, can now
be done with ease. What formerly
took professional programmers
days and weeks, can now be done
in minutes--automatically. You'll
soon be wondering how you ever
got along without The Producer.

Enjoy These Fine Producer Advantages

An easy-to-follow tutorial takes
you step-by-step through the
program creation process. It is all
you need to get started.

Very best screen generator.
Enjoy the freedom of designing
your screen any way you choose,
including graphics. Insert, delete,
move blocks of text.

Full editing control. Easily edit
and refine your program at any
time, even after completion,
without having to start over.

Lightning-fast file access never
keeps you waiting. You also get the
advantage of global search and
replace, batch mode data entry,
and automatic file rebuilding.

Full support of math functions
including subtotals and global
calculations.

Versatile report generation that
even allows interfield calculations
and printing reports on your
standard forms.

Technical support through a fully
indexed 200 page reference
manual. You may never need to
read it, but its there, just in case.

We accept Money Orders, Cashier's Checks, VISA, MC, AmEx, and corporate purchase orders.

\$99⁹⁵

Save on
this new
reduced price!

TRS-80 Models 1, 3, 4 and 4-P

Please specify which model when ordering.
Add \$5 Shipping, \$20 International.

Ask about DATA SHUFFLER \$34.95

All purpose Sort/Merge program.

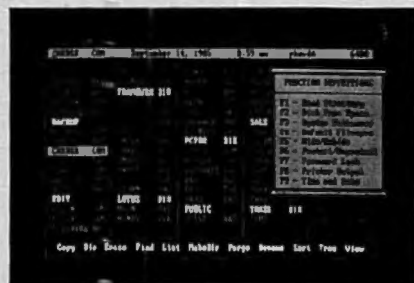


\$49⁹⁵

Add \$5 handling,
\$15 International

Interactive
DOS Utility

Resident program gives
instant access to many
enhanced DOS functions
and instant return to
where you were!



Reduce time searching for
files and performing DOS
Commands. See up to 85 files per
screen page. Identify sub-directories
at a glance. Get quick and easy
display of contents.

Make your DOS commands
easier to use. Pop-up windows
simplify DOS operations, utilize single
keystroke commands, and return you
instantly to where you left off.

Take full control of your printer.
Call up printer output window from
inside any program and give necessary
printer commands.

"WindowDOS quickly established itself as an
indispensable part of my PC environment.
I can't imagine working without it."
Paul Bonner, Reviewer, PC Week

★★★★★
Winner of 5 Stars
in 80 Micro Magazine's
Software Review!

Compatible with:
Tandy 1000 & 1200
IBM PC, XT, AT

and true compatibles. Requires DOS 2.0 or
newer and 80 column display. Uses only 40K of
memory.

Fine Times In Fort Worth

Tandyland

The Tandy 1000 was the 1985 sales leader among low-cost IBM PC compatibles, according to the Dallas-based market research firm Future Computing. Paced by the 1000's strong showing, Tandy managed to finish second to Compaq Computer Corp. in the overall IBM compatibles market, which includes clones of IBM's PC XT and AT hard disk computers.

Combined sales of the 1000 and the 1200 (Tandy's XT compatible) were 185,000 in calendar year 1985. Future Computing reports. Of that number, the 1000 accounted for the lion's share with 110,000 units sold. Sources in the Tandy Towers think this number is low, however, and suggest the real figure is closer to 125,000. Roughly a third (57,000 units) of Tandy's IBM compatible sales came in the fourth quarter, spurred by a promotion for the 1000 that included a color monitor in the computer's \$999 purchase price (see Photo 1).

Other players in the low-cost segment of the PC-compatible market are Leading Edge's Model D computer (\$1,495), IT's Xtra (\$1,400), and the NCR PC4 (\$1,695).

December sales of computers, software, and other electronic items catapulted Tandy into its first-ever billion dollar quarter. The company closed the books on the second quarter of fiscal 1986 with sales and operating revenues of \$1.09 billion, a 21-percent gain over the previous year. Sales in December tallied over \$509 million.

Half-year totals for fiscal 1986 gave further evidence that Tandy is rebounding from the financial disappointment of the year before. Sales and operating revenues for the six-month period ending Dec. 31, 1985, were \$1.8 billion, a 19-percent increase over the \$1.5 billion recorded during the same period in fiscal 1985. For stockholders, the increase

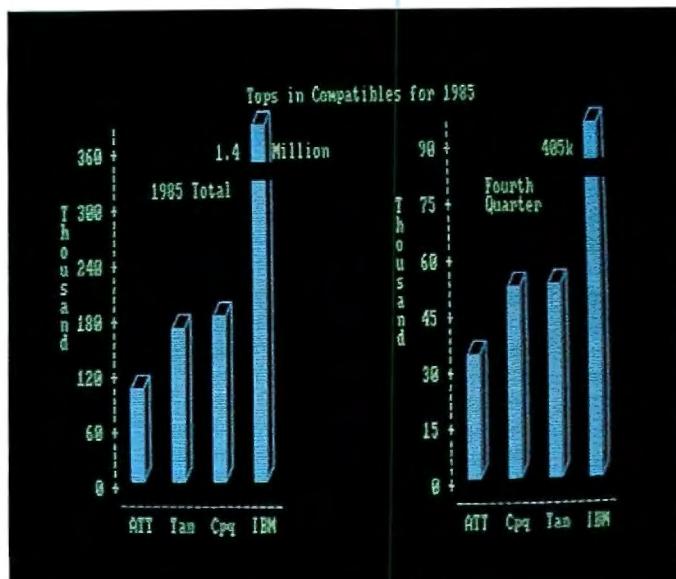


Photo 1. Top sellers of low-cost IBM PC compatibles in 1985.

translates into a yearly gain of 15 percent, with earnings per share leveling off at \$1.45 compared to \$1.26 a year ago.

Shopping for off-the-shelf software at Radio Shack Computer Centers will be an easier task thanks to the release of the 1986 Radio Shack Reference and

1986 Radio Shack® Software Reference and Tandy® Computer Guide

Over 600 programs listed by category and available off the shelf or through our Express Order® service.

Plus, 24 pages devoted to the complete line of Tandy® computers and peripherals.

Radio Shack
COMPUTER CENTERS
A Division of Tandy Corporation

- ACCOUNTING
- BUSINESS GRAPHICS
- BUSINESS MANAGEMENT
- COMMUNICATIONS
- DATABASE
- EDUCATION/TRAINING
- ENTERTAINMENT
- GRAPHICS DESIGN
- INDUSTRY-SPECIFIC TOOLS
- INTEGRATED PRODUCTS
- MATH/SCIENCE
- OPERATING SYSTEMS
- PERSONAL MANAGEMENT
- PROGRAMMING TOOLS
- SPREADSHEETS
- UTILITIES
- WORD PROCESSING
- COMPUTERS/PERIPHERALS

Figure. The new 1986 Radio Shack Reference and Tandy Computer Guide.

Tandy Computer Guide (see the Figure). The 100-page catalog lists over 1,200 hardware and software products, including more than 600 software packages from Tandy's Express Order Software (EOS) list.

In addition to giving more visible coverage of EOS, the catalog contains a few new products of interest to Tandy 1000, 1200, and Color Computer users.

For \$499.95, Tandy is offering a Deluxe Graphics Display Adapter and a Deluxe Text Display Adapter. The cards are designed for Tandy 1000 or 1200 computers with high-resolution CM-1 or VM-1 displays. For Color Computer users,

Tandy is offering two new peripherals: the Hard Disk Interface cartridge priced off at \$129.95 and the DC Modem Program Pak retailing for \$89.95.

The long-awaited successor to the Color Computer 2 debuted without so much as a press release from Tandy. The less said the better was perhaps the company's thinking. Contrary to expectations, the new CoCo does not have improved resolution, does not have 128K standard memory, does not run OS-9 as its primary operating system, and does not contain onboard disk drives. The new 64K standard Tandy Color Computer does have true lowercase characters and a zero key with a slash through it.

MicroTrends

Although the computer industry will emerge from the depths of last year's financial slump, it will not experience explosive growth in 1986. That's the word from International Data Corp. (IDC), a market research firm based in Framingham, MA.

Personal computers will continue to dominate the market, accounting for 37 percent of worldwide computer ship-

ment value by 1990, the firm states in a report titled *The Computer Industry Review and Forecast*. In the period from 1984 to 1989, shipment value of personal computers will grow 16.3 percent, the report adds. IDC sees IBM and compatible systems having a sales edge through the remainder of the decade as microcomputer use shifts from home/hobby to business applications.

"The market for CP/M machines is dead," says Evan Moltz, director of microcomputer services at International Data Corp. Moltz predicts that the popularity of 8-bit CP/M machines will decline as newer, faster machines come down in price. Kaypro Corp., perhaps the last holdout in the CP/M market, decided earlier this year to eliminate two of its three CP/M micros in order to concentrate on MS-DOS machines.

"Although the . . . move to consolidate their line is a good one, Kaypro is a little late," Moltz observes. "The rest of the industry recognized the standard a couple of years ago." Nonetheless, even Tandy dragged its feet in getting wholeheartedly into the MS-DOS game.

Kaypro intends to support and continue selling its CP/M-based Kaypro 2x machine while enhancing its PC-compatible line. Although the company plans to discontinue two PC AT clones, the Kaypro 286i Model B and the 286i Model D, it will add a 20-megabyte hard disk to the Kaypro PC, its PC XT clone, and increase internal memory from 256K to 768K in the Kaypro 2000 laptop.

While microcomputer sales slackened in the U.S. market in 1985, they picked up dramatically in Europe. The personal computer market grew 56 percent in Europe last year. For 1986, however, the projected growth rate is 38 percent.

A report generated by Paris-based Intelligent Electronics Europe suggests that growth will be higher in countries like Italy and Austria where PC sales haven't yet peaked. Nations like Great Britain that have a mature market will see lower-than-average growth. Projected growth in Italy and Austria for 1986 is in the 60- to 80-percent range. Projected growth in Great Britain, on the other hand, is only 27 percent.

Microsoft Corp. is going public with an initial stock offering of 2.5 million shares at between \$16 and \$19 a share. Though sources close to the company think the book value is about \$15 a share today, the company expects its stock to

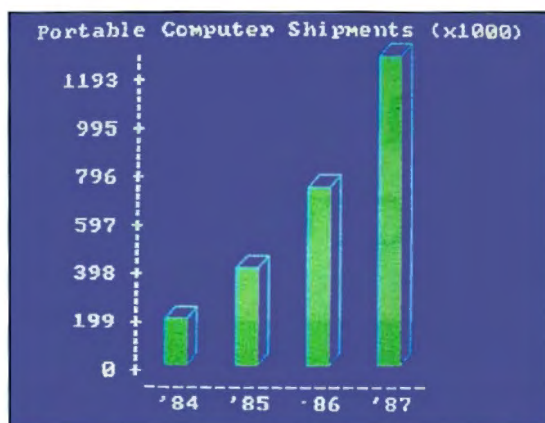


Photo 2. Worldwide laptop shipments, 1984-1987.

be worth \$35 a share within two years.

The investment community was enthusiastic about the offering, which it had anticipated. In a story in the February 11 issue of *PC Week*, Joseph Kapka of the Silicon Valley investment firm Bateman Eichler is quoted saying, "I think Microsoft is one of the blue chippers."

Jeff Silverstein of Digital Information Group in Stamford, CT, said, "A lot of what goes into a stock offering is based on future value, but Microsoft has a good long-term record and a good relationship with IBM. If the stock price is too high, that might be a discouraging factor, but the market will decide what kind of premium to place on the offering." He added that, unlike some other high-tech companies, Microsoft is not a flash in the pan and can look forward to solid long-term growth.

Among software publishing companies, Microsoft's stock price is about average. At press time, the price of individual shares of Ashton-Tate and Lotus Development Corp. hovered around \$20, while Software Publishing's stock was slightly over \$7 a share.

Update

A new chapter in the Microsoft Windows saga opened in January when Lotus Development Corp. announced it would support the graphics operating environment with future product releases. "We are already developing entire new families of products that will take advantage of Microsoft Windows," Lotus chairman Mitch Kapor said. Lotus will not update current versions of 1-2-3 and Symphony to make them run under MS-Windows, however.

Microsoft, meanwhile, told software developers at a company-held conference in February that they will have problems working with future versions of MS-DOS if they do not adopt the programming rules of MS-Windows. "We're not trying to legislate anything," said Mi-

crosoft chairman Bill Gates. "We're just suggesting that unless you have a particular reason for going out of these guidelines, it would be very, very advantageous to conform."

Underscoring that message, Windows product manager Steve Ballmer informed developers that future versions of MS-DOS will adopt Windows features and support Intel Corp.'s 80286 microprocessor. He urged other software companies to conform to the same standard in order to ensure that applications will run under Windows and new versions of MS-DOS.

As these statements indicate,

Windows has become an integral part of Microsoft's overall product strategy. The company shipped 35,000 copies of the product within two months after its well-publicized November 1985 debut at Comdex/Fall. Acceptance has been so high, especially among corporate users, that The Ferrin Corp., a San Francisco-based market research firm, believes Windows will become the *de facto* standard in the next two years, attracting 70 percent of the market.

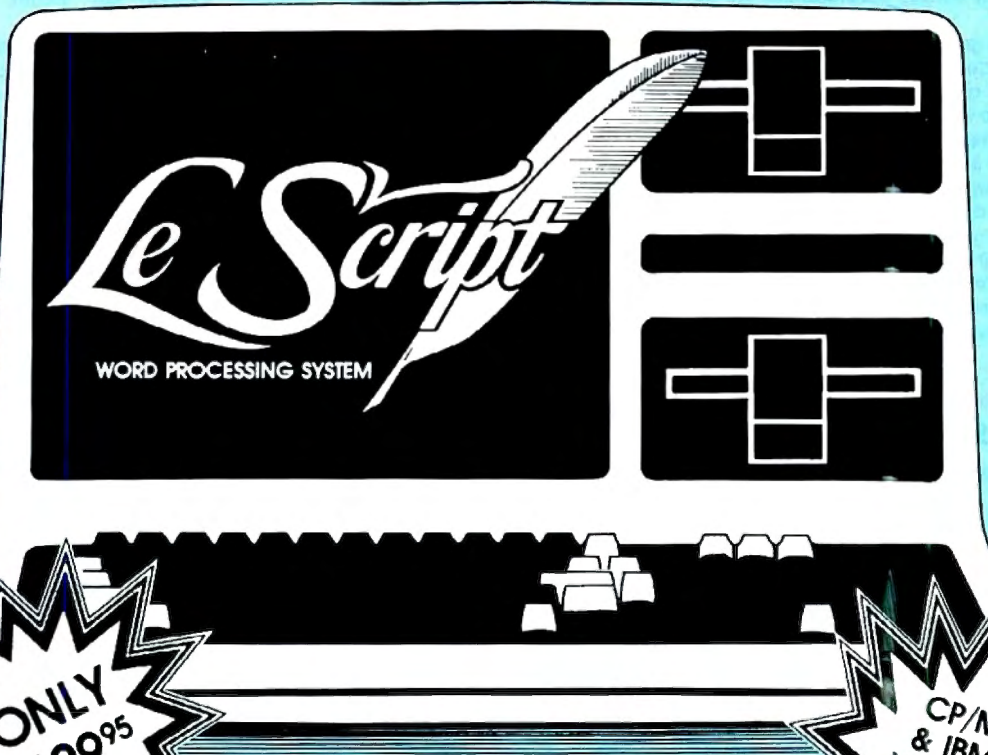
To become the industry standard, MS-Windows must overcome competition from such products as IBM's TopView, Digital Research Inc.'s GEM, and Quarterdeck Office System Inc.'s Desqview.

Surprise, surprise, surprise! IBM did NOT win the \$27 million contract from the Internal Revenue Service that nearly every industry analyst in the business had assumed was a *fait accompli*. The big winner is Zenith Data Systems, which manufactures the 15-pound Z-171 laptop. Terms of the contract call for the installation of 15,000-18,000 laptop units at the IRS.

Though IBM lost the bid, industry watchers view Big Blue's product initiative as a positive step that might help galvanize the laptop market. Since 1983, companies such as Hewlett-Packard, Tandy, Zenith, and GRiD have been jockeying for market position. IBM's emergence as a contender in the laptop industry might divert sales from those manufacturers. According to Rich Baldwin, senior buyer for Stanford University in Palo Alto, CA, "What it does is make the alternatives secondary. There will be a desire on the part of ultimate users to have an IBM, not a Tandy, not an H-P. The name will make a difference."

In 1985, manufacturers shipped 467,000 laptop computers. Dataquest, a market research firm based in San Jose, CA, predicts that the industry will ship 794,000 laptop computers in 1986 and over 1 million in 1987 (see Photo 2). ■

TRS-80 AND IBM-PC Word Processing Program



Computers Supported
 IBM-PC
 IBM-XT
 Tandy 1000
 Tandy 1200
 Tandy 2000
 Model 4
 Model 2
 Model 12
 Model 16
 Modem 4 CP/M
 Model 2 CP/M
 Max-80
 LNW

ONLY
\$129.95

"I'd say that LeScript comes the closest to being the right word processor for the largest number of people."

(80 Micro, November 1985)

**CP/M
 & IBM
 Versions**
\$199.95

- 80 x 24 DISPLAY using TRSDOS 6 or any MODEL III DOS.
- Built-in FORM LETTER and MAIL-MERGE capabilities.
- Build-in HELP SCREENS.
- 55 separately programmable MACRO FUNCTION KEYS.
- Performs PROPORTIONAL-SPACE right-margin justification on over 120 different printers (all drivers included FREE).
- Integrates with ELECTRIC WEBSTER spelling checker.
- Keyboard entry and printing of 31 European Characters and special symbols.
- IBM-PC, XT, Tandy-1000, Tandy-1200, Tandy-2000 versions for color or Monochrome, now only \$199.95.
- MODEL 2/12/16 versions now available for TRSDOS 2.0, TRSDOS 4.2 and CP/M. \$199.95.
- LeScript also available to run on TRS-80 MODEL I, MODEL III, LNW-80, LNW-TEAM (80 x 24), Holmes VID-80 (80 x 24), and Lobo MAX-80 (80 x 24). \$129.95

CALL 1-305-259-9397

ANITEK

ANITEK SOFTWARE PRODUCTS
 P.O. BOX 361136 □ MELBOURNE, FL 32936



FREE SHIPPING WITHIN THE U.S.; OUTSIDE THE U.S. ADD \$10.00 FOR SHIPPING; FLORIDA RESIDENTS ADD 5% SALES TAX. ALL ORDERS PREPAID BY CHECK, MONEY ORDER, CREDIT CARD OR C.O.D. Circle 141 on Reader Service card.

FREE

TRIAL-SIZE DISK OFFER

Fill out and return this coupon to receive a free trial-size copy of the LeScript word processing system - a \$25.00 value.

Name _____

Address _____

City _____

State _____

Zip _____

Telephone _____

My system is:

- | | | |
|--------------------------------------|--|--|
| <input type="checkbox"/> Model I/III | <input type="checkbox"/> Holmes VID-80 | <input type="checkbox"/> CP/M LNW-TEAM |
| <input type="checkbox"/> Model 4 | <input type="checkbox"/> Model II | <input type="checkbox"/> CP/M VID-80 |
| <input type="checkbox"/> MAX-80 | <input type="checkbox"/> CP/M Model 4 | <input type="checkbox"/> TANDY-2000 |
| <input type="checkbox"/> LNW-TEAM | <input type="checkbox"/> CP/M MAX-80 | <input type="checkbox"/> IBM PC |

Send to: ANITEK • P.O. Box 361136 • Melbourne, FL 32936

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

14 Lexington Road
New City, New York 10956

Information and same day orders

(914) 634-1821

30-day Money Back Guarantee!

*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.

NEW! 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

When ordering, please give your computer model number.

Terms: Checks, Visa, Master Card or C.O.D.

Shipping and handling \$3.00 (Canada, Mexico, Hawaii, St. O.K.)

Mystery Solved

A SuperScript question printed in January's Reader Forum has produced results. Both Jeanette J. Bieber-Moses (author of *SuperScript Word Processing for the TRS-80 Models III, 4, and 4P* [Scott, Foresman, and Co.]), and R.E. Whittaker tackled the problem of **printing headers when blocking** (p. 28). As they point out, to print headers with a designated automatic page number, you must coordinate responses to the Open Document ("1st page to include header:") and Print Text options ("Begin numbering as page:").

If the first page with a header is p. 2 and the first numbered page is p. 1, SuperScript won't print a header on the first page (or on a partial page that has been blocked and printed). SuperScript recognizes the beginning of the block as the first numbered page. Consequently, when you designate p. 1 as the first numbered page, the computer prints a header only if you also make p. 1 the first page to include a header.

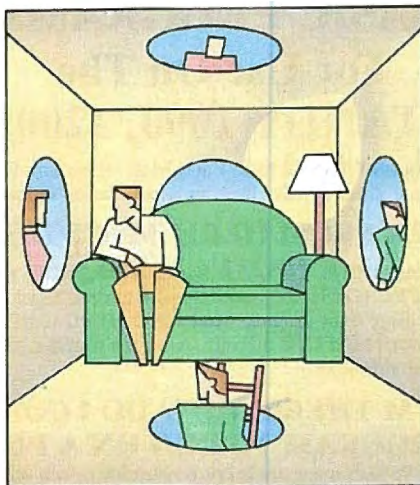
If, like Whittaker, you've configured a working disk to begin printing headers and footers on p. 2, you can still circumvent the problem. Initiate the block print command and when you get to the Print Text Option screen, change the beginning page number to any number larger than 1. This is particularly helpful if, for example, you find a typographical error on p. 3 of a five-page document. Make the correction, block the text that appears on p. 3, initiate the block print command, and change the beginning page number to p. 3. You can then reprint a single page instead of the entire document.

A similar technique lets you resume printing after you've stopped to make corrections. Make the necessary changes, initiate the control-X block print command at the top of the page where you began corrections, and use the End of Text option to mark the block. Next, use the block print command, substituting the page number you want to use as the new first page.

Second Appearance

Robert B. Caldwell of Sunnyvale, CA, came up with a way to get more for less, **improving on D.Y. Barrer's square root program** ("Putting Things Precisely," February 1986, Program Listing 6, p. 55). Caldwell's version uses fewer lines and variables and also lets you compute all roots—square root and higher (see Program Listing 1).

Tidbit #36 (March 1986, p. 112) caught the attention of Michigander William Ward and Oklahoman Karl James.



Both offered **concise alternatives for making the cursor visible during INKEY\$ routines**. Ward's solution uses CHR\$(14) and CHR\$(15) to turn the cursor off and on (see Program Listing 2). James developed two routines (see Program Listings 3a and 3b); the second expands the INKEY\$ function to print the input value on-screen. To call either routine, use:

```
20 PRINT "Enter your choice?";GOSUB80.
```

From Fresno, CA, comes another Tidbit modification. Dennis M. Lewis worked out

Model 4 changes for Tidbit #25 (July 1985, p. 112), which lets you **create very long program lines by combining lines**. Change PRINT@64 in line 120 to PRINT@80, replace line 130 with C=&H8049, and replace PRINT@138 in line 150 with PRINT@170.

Jeffrey Terry's article on bypassing passwords (November 1985, p. 72) prompted Philip Dater of Albuquerque, NM, to offer a **1-byte zap to eliminate problems resulting from a password mismatch under TRSDOS 6.2**. Using a zap utility (like LSI's FED, Apparat's Superzap, or PowerSoft's Super Utility), zap byte 31 of sector 2, changing its value (52 hexadecimal) to 00 hex. Once you do this, you'll be able to load, run, or copy programs without worrying about password protection.

Dater also set the record straight on hash codes: 9462 hex is the hash code for eight blanks, not for PASSWORD as the article stated.

The Root of the Problem

Roxton Baxter's article, "Finding Your Roots" (February 1986, p. 51), contains an error. Correct line 5020 of the example subroutine to read:

```
5020 Y(3)=(X(1)+X(2))*U(1)-X(3)
```

Program Listing 1. Program to compute any root.

```
10 CLS:PRINT "FOR ANY INTEGER R>1, THE RTH ROOT OF ANY POSITIVE N
NUMBER IS CALCULATED WITH 16-DIGIT ACCURACY.":DEFDBL D
20 INPUT "ENTER THE NUMBER WHOSE ROOT IS DESIRED":DN
30 INPUT "ENTER THE INDEX R":R
40 IF R=2 R$=" SQUARE" ELSE IF R=3 R$=" CUBE" ELSE R$=STR$(R)+"T
H"
50 PRINT "THE "R$" ROOT OF "DN" IS ";
60 D=DN^(1/R): REM [ STANDS FOR RAISED TO THE POWER
70 FOR T=1 TO 3:DM=1
80 FOR V=1 TO R-1:DM=DM*D
90 NEXT V:D=D-D/R+DN/R/DM:NEXT T
100 PRINT D
```

End

Program Listing 2. William Ward's improvements to Tidbit #36.

```
100 PRINT "YOUR CHOICE? ";CHR$(14);
110 A$=INKEY$:IF A$="" THEN 110 ELSE PRINT A$;CHR$(15)
120 REM PROGRAM CONTINUES...
```

End

Program Listing 3. a) Karl James' improvement to Tidbit #36.

```
80 E$=INKEY$:IF E$<>" " THEN RETURN ELSE PRINT CHR$(21);CHR$(176);:FORK
%=1TO100:NEXT K$:PRINT CHR$(8);" ";CHR$(8);CHR$(21);:FORK%=1TO100:
NEXT K$:GOTO80
```

End

b) Verston providing on-screen input.

```
80 E$=INKEY$:IF E$<>" " THEN 81 ELSE PRINT CHR$(21);CHR$(176);:FORK%=1T
O100:NEXT K$:PRINT CHR$(8);" ";CHR$(8);CHR$(21);:FORK%=1TO100:NEXT
K$:GOTO80
81 PRINT E$:RETURN
```

End

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

CONV3TOPC V2.0—(WITH Hypercross)	\$139.95	CONV3TOPC V2.0—(WITHOUT Hypercross)	\$119.95
CONV4TOPC V1.0—(WITH HYPERCROSS)	\$139.95	CONV4TOPC V1.0 (WITHOUT HYPERCROSS)	\$119.95
Same as CONV3TOPC V2.0, but specifically for mod 4 BASIC and FILES		CONV3TO4—Mod I/III to Mod 4 BASIC	\$49.95
CONV3TOPC V2.0 DEMO (Runs on any PC)	\$20.00	HYPERCROSS—Mod 4, PC-DOS formats	\$49.95
HYPERCROSS—Mod I/III, PC-DOS format	\$49.95	ISAM ROUTINES—Incorporate these routines in your PC BASIC programs. They provide keyed access to random files & complete file maint.	\$69.95
CROSS REFERENCE—For PC BASIC programs. Lists all referenced variables, line numbers, etc.	\$24.95	RAMDISK—Create superfast pseudo disk drive (eg. create a 90K RAM drive C: and still have 60K for BASIC on 256K PC).	\$49.95
FASTSORT—Machine language SORT callable from PC BASIC. Great PC subst.for Mod III BASIC's CMD""O"" command.	\$24.95	INSIDE TRACK—Over 60 PC utilities that compliment PEEKs 'n POKEs package. Too many functions to mention...	\$44.95
PEEKs 'n POKEs—Over 50 utilities that enable PC BASIC programs to access and modify PC/MS-DOS system functions.	\$29.95		

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.



ZBasic Goes Here, There, And Everywhere

by Hardin Brothers

★★★★

ZBasic runs on the Models I and III (48K), Model 4 (64K), and the Models 1000/1200/2000/3000 (128K). Zedcor Inc., 4500 E. Speedway Blvd., Suite 93, Tucson, AZ 85712, 800-482-4567. \$89.95.

Easy to use: ★★★★★
Good docs: ★★★★★
Bug free: ★★★★★
Does the job: ★★★★★

If you program in Basic, using a compiler for the first time is like a breath of fresh air. Your programs seem to run at speeds you never dreamed possible.

ZBasic is a new compiler available for most popular computers. I have been using versions for the Model III, the Model 4, CP/M 2.2, and MS-DOS. One of ZBasic's nicest features is that you can write essentially the same program for all versions. If you program carefully, you can move a program from one operating system to another with very few changes.

While ZBasic does have important advantages over Microsoft Basic, such as portability between computers and some advanced features, it also has a few limitations that can make programming difficult.

Working with ZBasic

ZBasic is fundamentally different from most Basic compilers. With other compilers, you write and debug a program in interpreted Basic and then run the program through the compiler. You have the advantage of an interactive, interpreted language while you are developing a program and the advantage of speed when you run the compiled program.

Adjusting to ZBasic might take time because it is similar to a fully compiled language like Turbo Pascal. You create a program using ZBasic's editor (or you can use any text editor that produces ASCII text) and run the program only in compiled form. You can quickly compile



and run small or moderate-sized programs from ZBasic's editor. However, you must compile larger programs from or to a disk file and then run them.

Because of this difference in working procedure, ZBasic might be frustrating to use at first. You can't print the values of variables after a program has run to see if a function or code is working correctly. Unless you are careful, you might be unable to break out of an endless loop without rebooting your computer.

ZBasic is also unusual because it is case-sensitive. Unlike Microsoft Basic, it forces your program code into uppercase only if you tell ZBasic to do so. Its variable names are significant to 15 places but may not contain reserved words. To avoid conflicts, you can either restrict yourself to two-letter variables (as in Model I/III Basic) or train yourself to use lowercase letters for variables and uppercase letters for Basic commands. I generally type in lowercase, regardless of the language I'm using. At first, I found it difficult to remember to shift cases continually in order to write lines like:

```
IF count < 15 THEN mystring$ = STRING$(count, '*')
```

Advanced Numbers And Graphics

If you work with numeric data and

functions, you will undoubtedly appreciate ZBasic's multiprecision math capabilities. ZBasic uses a numeric technique called binary-coded decimal that practically guarantees no unexpected round-off errors in your programs. ZBasic's math operators include most functions available in Microsoft Basic plus bit-shifting of integers, rounding of values, and a special function called Maybe, which randomly returns a -1 or zero (true or false). ZBasic can convert between decimal, hexadecimal, octal, and binary number bases, which makes certain programs much easier to develop.

ZBasic's machine-independent graphics capability is also very impressive. You can create and fill boxes, circles, and ellipses and draw lines and arcs with simple commands. ZBasic creates such graphics on a "virtual" coordinate plane that is 1,024 by 768 points, no matter what computer you are using. It then determines the best way to represent those points on your screen. On a TRS-80 with a high-resolution board or an MS-DOS computer, ZBasic draws more precise lines than on an unmodified Model III. However, the figures will be the same size, regardless of screen resolution.

The machine independence of ZBasic's graphics commands is representative of the philosophy behind the compiler. Probably no other programming language can produce similar graphics on everything from a Model I to a hi-res Model 4 to a Tandy 1000, with a single set of commands.

ZBasic's Print and Input commands are capable of displaying information either at absolute character positions or at relative, machine-independent positions on the 1,024-by-768-point virtual screen. The Input command also lets you specify the maximum length of an input string and whether a carriage return is displayed when a user presses the enter key. This makes writing data

base programs that require user input easier in ZBasic than in Microsoft Basic.

Program Structures

ZBasic includes several flow-control structures that Microsoft Basic lacks. Its If...Then...Else structure can continue over several program lines. It has both While...Wend and Do...Until structures. It permits use of labels instead of line numbers in GOTO and GOSUB commands. Particularly useful are ZBasic's "long" functions, which can continue over several program lines and include both statements and expressions. You can structure the functions to return a value to a calling routine.

In many ways, ZBasic's long functions are similar to subroutines but are more powerful because they can receive values from a calling routine and substitute those values for formal parameters. These functions give ZBasic some of the feel and power of languages like C and Pascal.

Weak Strings and Files

On the other hand, ZBasic's string commands are weaker than Microsoft Basic's. The compiler supports most familiar string commands, along with a string function called UCASE\$, which converts an entire string to uppercase automatically. However, ZBasic doesn't allow nested string functions, such as Left\$(Mid\$(A\$,4,12),6). Instead, you must use

ZBasic's long functions are more powerful than subroutines.

temporary variables to produce intermediate results in complex expressions.

ZBasic's Print Using command can handle only numeric data, not strings. Nor does ZBasic support RSET and LSET, commands that simplify many programming projects and make tasks like right-justifying string displays particularly easy.

ZBasic's greatest weakness is the way it handles disk files. Its sequential files are similar to those in Microsoft Basic, although you can't extend an existing sequential file. However, ZBasic's random-access file commands are similar to those in Applesoft Basic. There is no equivalent to the Field command nor to Put and Get. The compiler doesn't ensure that your data will fit in a single record without overflowing into the next record. Essentially, it handles random-access files like sequential files, adding only the ability to start reading or writing at a specific location in the file.

If you rarely use random-access files in Basic, this weakness probably won't bother you. But if you want to create a data-handling program in ZBasic, you will have to do a lot of extra programming to work around the compiler's shortcomings.

Memory Management

Like other Basic compilers, ZBasic allocates a fixed location in memory to each string variable used in a program. Unless you set a default length for all strings or designate the maximum length of each string in a Dimension statement, ZBasic allocates 256 bytes per string. By doing so, it avoids garbage collection delays that slow down many interpreted Basic programs. However, if you don't use strings carefully, a few string arrays can use up all your free memory.

Two special ZBasic arrays can help you manage your computer's memory more efficiently. The first, Index\$, uses dynamic allocation techniques in a special area of memory. Special commands allow you to insert or delete strings in the Index\$ array and search the entire array quickly for a specific string or substring.

The second special array, PSTR\$, lets you build an array of pointers to literal strings contained in your program. With PSTR\$, you don't have to use extra memory for copying strings from Data

statements to new locations. You can instruct ZBasic simply to record the address of a literal string instead of the entire string; in some programs, the memory you save using PSTR\$ can be significant.

The TRS-80 versions of ZBasic allow use of overlays (similar to Model 4 Basic's Chain Merge) as another aid for squeezing large programs into a small memory space. Unfortunately, the overlay facility isn't available in the other versions, so you can't use it if you are developing a program to run on several different computers. While all versions of ZBasic let you chain from one program to another and share common variables, only the TRS-80 versions permit your program modules to share common subroutines and program code.

Documentation

ZBasic's documentation is supplied as a 300-page spiral-bound notebook. The first half explains how to program in ZBasic; the second half describes each of ZBasic's statements, functions, and operators. The index is adequate. A separate appendix for each version of ZBasic discusses the commands unique to that version.

The documentation is generally good but is plagued by many typographical errors, some of which can lead to serious confusion about how ZBasic's commands work. You'll probably have to experiment with many of the commands in order to understand them fully.

Conclusion

It's difficult to give ZBasic an overall rating. It certainly deserves high marks for speed, portability between many different computers, number handling, and graphics. But the built-in editor is not much better than the TRS-80's Basic editor, and it's more difficult to use than the Tandy 1000's full-screen Basic editor.

ZBasic also deserves high marks for its control structures, support of labeled lines in subroutines, and its unique Index\$ and PSTR\$ arrays. On the other hand, its general string functions are merely adequate and its random-access file commands are far weaker than they should be.

You should probably plan to use ZBasic almost exclusively instead of switching back and forth between it and Microsoft Basic. The two Basics are different enough that moving from one to the other can cause frustration.

Whether you should buy ZBasic depends, to a large extent, on your needs and programming style. Some programmers will find it an excellent compiler and development tool. Others might find that working around ZBasic's limitations is more trouble than it's worth. ■

The Star Ratings

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

In most cases, the overall rating is an average of the ratings in each of the four specific categories. However, some overall ratings may be higher or lower than this average, depending on the reviewer's subjective opinion.

The stars mean:

- ★★★★ Superior:
- ★★★★ Excellent:
- ★★★ Good:
- ★★ Fair:
- ★ Poor.

The ratings terms translate as follows:

Easy to use: How easy is it for the new user to use the hardware/software/book?

Good docs: Is the documentation clear and helpful in explaining the product's use and anticipating user problems?

Bug free: Did the reviewer encounter any bugs while using the product?

Does the job: How well does the product do what it was designed for?

Something Old, Something New

by Thomas L. Quindry

★★★★☆

LeScript for the PC runs on the Tandy 1000/1200/2000/3000 (256K) and requires one disk drive. Anitek Software Products, P.O. Box 361136, Melbourne, FL 32936, 305-259-9397. \$199.95.

Easy to use: ★★★★★
Good docs: ★★★★★
Bug free: ★★★★★
Does the job: ★★★★★

TRS-80 owners who hop on the MS-DOS bandwagon will find several old friends already aboard. Among established TRS-80 word processors, both Anitek's LeScript and Tandy's Scripsit have now been converted for Tandy's MS-DOS line and other IBM PC-compatible computers. Anitek Software Products has done an admirable job in converting LeScript; not only are the TRS-80 and MS-DOS versions file-compatible, but they're very similar to use.

This review will highlight similarities in the two versions, as well as MS-DOS LeScript's special features. For reviews of Model 4 LeScript, see April 1984 (p. 33) and November 1985 (p. 38).

A Look at Features

In either version, LeScript is a powerful and easy-to-use word processor that can handle almost any task. The greatest advantage of using the program on an MS-DOS computer is file portability. Once you physically transfer a document from a TRS-80 to an MS-DOS machine or vice versa (either with a disk-based transfer program like SuperCross or Hypercross, or via the RS-232 port with a null-modem cable), no conversion is necessary.

Like the latest version of TRS-80 LeScript, MS-DOS LeScript has an extra text screen and a help file. The control-? command transfers you to the second screen. You can write text to the extra screen and work on two documents at once, or use it to store reference material for convenient access. If you have no document on the second screen, a help file is loaded and displayed. Control-? toggles between screens; the text on each screen remains intact as you switch back and forth.

Although you can use MS-DOS LeScript with either a color or monochrome monitor, color really brings out the program's assets. The colors are preset to a pleasing combination, but they can be changed

from within the program or from a file that sets colors automatically when LeScript loads in.

Color plays an important role, as different colors highlight various printing controls, like underlining and italics. This is much nicer than the blinking characters used in monochrome mode. Subscripts and superscripts still blink in color mode, though.

One difference between the two versions is that MS-DOS LeScript uses only the control key for command functions, while TRS-80 LeScript allows use of the control or clear key. Those who have been using the control key on a TRS-80 machine will find the transition easy, but clear key devotees will have to reorient themselves.

With minor exceptions, other commands for screen control and printing are similar in both versions. One exception worth noting—in the MS-DOS version, you press shift-print to print raw text including printing commands, but in the TRS-80 version, you press control-@. Also, MS-DOS LeScript has a screen-print command and TRS-80 LeScript doesn't.

Other special commands in the MS-DOS version take advantage of color and the extra keys of MS-DOS computers. Though TRS-80s have equivalent control key functions, it is much easier to use the Tandy 1000's insert, backspace (delete character to the left of the cursor), delete (delete character to the right of the cursor), end (go to end of text), home (go to beginning of text), Pg Dn, Pg Up, tab, and Caps Lock keys.

LeScript probably has more printer drivers than any other word processor, and Anitek continually adds to the list. The program's help file lists these printer drivers and printer codes. I did find one bug in the program when I wanted to print out a document, but Anitek has since fixed it.

Conclusion

Since I had used TRS-80 LeScript on my Models III and 4P, I was perfectly comfortable with LeScript on the Tandy 1000 and needed to learn only a few new commands.

LeScript would be ideal for an office where both TRS-80s and MS-DOS machines are used, since the commands are essentially the same and files are transportable.

When and if I decide to discard my Model 4P, I know I'll be able to transport my TRS-80 LeScript documents to my Tandy 1000 without any problems. For TRS-80 users, this new LeScript provides a way to move to MS-DOS without leaving the cozy confines of a familiar word processor. ■

Bulletin Board Notes

by Bradford N. Dixon

★★★★☆

The Bread Board System runs on the Tandy 1000/1200/3000 (256K) and requires either two disk drives or one disk drive and one hard drive. eSoft Inc., 4100 S. Parker Road #305, Aurora, CO 80014, 303-699-6565. \$299.95.

Easy to use: ★★★★★
Good docs: ★★★★★
Bug free: ★★★★★
Does the job: ★★★★★

★★★

The Courier 2400 Modem operates at 300/1,200/2,400 baud and is Hayes compatible. US Robotics Inc., 8100 N. McCormick Blvd., Skokie, IL 60076. 312-982-5151. \$350 with TBBS; \$699 alone.

Easy to use: ★★★★★
Good docs: ★★★★★
Well made: ★★★★★
Does the job: ★★★★★

The telecommunications boom has brought an increasing number of bulletin board systems (BBSes) operated by individuals or small businesses. ESoft's The Bread Board System (TBBS), one of the first and best TRS-80 systems, has now moved over to MS-DOS territory. For a limited time, eSoft offered the US Robotics Courier 2,400-baud modem at a discount to bulletin board system operators who bought the MS-DOS TBBS program. For \$650, you got a professional bulletin board system and a 2,400-baud modem. Although I experienced numerous problems with the modem, the combination was hard to resist.

The Bread Board

I set up The Bread Board System on a Tandy 1200 (with the 10-megabyte hard drive) coupled with the Courier modem.

The TBBS software is not for the novice with romantic dreams of running his or her own CompuServe system. It's a high-powered package that requires a great deal of attention, and you could easily become lost or frustrated.

TBBS can be tailored to fit any system operator's (sysop's) needs, from a simple message center to a complex board with multiple message bases, subboards, data bases, and on-line polling of callers. The program consists of several editors that let you custom design a system.

The user log editor (ULEDIT) sets up the bulletin board's security and main-

tains the list of users. It lets the sysop control callers' access, their privilege and authorization levels, and which message boards they may call. ULEDIT will also list each caller's activity, showing the dates of the last 10 log-ons and total number of log-ons.

CEDIT, the configuration editor, creates your TBBS files and builds the system's skeleton. As you design your board's welcome message and outline the names and types of its message boards and data bases, your BBS will start to take shape. The process is completely menu-driven. In fact, it's more like taking a multiple-choice test than programming a bulletin board. Attention to detail is important, though, and I advise planning your choices before programming with CEDIT.

If CEDIT constructs a board's skeleton, MEDIT (menu editor) fleshes it out. This is where you give your board its personality. The menu editor programs a caller's movement through the system's message bases and data bases. Some sysops set up their boards like buildings, with the menus acting as elevators to move people between floors. Other systems are more like interconnected tubes through which you travel via the menus. It is up to you to decide how you want your BBS to look and act.

For sysops who want to poll their callers, TBBS has a QAEDIT module that sets up a question-and-answer section on the board. This can be particularly useful to new sysops who don't have a clear idea of the features their callers want. QAEDIT writes callers' responses to a special file where the sysop can review them.

The TBBS software is by far the most comprehensive I've used. It isn't the easiest nor is it the fastest, but it gives the sysop a great deal of flexibility in designing a bulletin board. It provides 43 menu commands and allows up to 25 separate message boards and hundreds of user access variations. The data base software supports both XON/OFF and XMODEM transfer protocols, and the on-line help file is very complete.

US Robotics Courier 2400

I'm enthusiastic about the TBBS software, but I am not impressed with the Courier modem. Although I sent it to US Robotics for repairs three times, it still doesn't work properly. Considering the price you pay for its high-speed capability, the modem doesn't qualify as a bargain. After you finally get your software up and running, it's infuriating to have modem trouble keep you from going on-line.

Setting up the Courier is a snap. The bottom of the unit has almost all the instructions you'll need to use it in either answer or originate mode. The DIP

switches are easy to access and the plug ports in the back are labeled clearly.

When I could get the modem to work, it worked well. There's nothing like watching a caller download a file eight times faster than 300 baud. No wonder on-line services charge additional fees for 2,400-baud callers: They get on, do their business, and log off before a caller at 300 baud has finished reading the opening bulletin.

The Courier worked flawlessly in originate mode. I accessed many BBSes and CompuServe without a hitch. The modem recognizes Hayes commands from terminal software, so users of other Hayes compatibles have nothing new to learn about talking to the Courier. I was able to upload and download files (both ASCII and XMODEM transfers) over phone lines that would have given other modems fits.

US Robotics would be the first to admit that the Courier had some problems when it was first released. If my experiences are any indication, the defects haven't been completely rectified. If you're interested in a Courier, you should ask specific questions about its performance: how it responds to a dial tone if a caller hangs up when the modem is expecting a carrier tone from the remote, whether or not it accepts calls from a Model 100, and whether it is subject to heat buildup. These are the problems I had with my unit.

Each time I sent the modem back, the people at US Robotics were helpful and listened to my complaints. They replaced parts as needed, but wouldn't replace the unit. Maybe I received a lemon, but I've spoken with other users around the country who had the same problems.

Conclusion

I have a couple of complaints about TBBS. One is its documentation, which can be intimidating. It's complete but gives only one example for each editor, leaving the user to discover alternatives.

My other complaint is the price. At \$300, TBBS is by far the most expensive micro-based BBS system I've seen. While it's one of the best, other tried and true systems are available, many in the public domain. Still, you're buying a complete package with TBBS, and eSoft's technical department offers help in setting up a system. This makes the price an easier pill to swallow.

I was disappointed with the Courier. When it's running correctly, it performs admirably. However, getting it to work was a long, drawn-out process. If US Robotics has worked out the bugs, the Courier is worth looking into for stepping up to 2,400 baud. But check it out thoroughly before you make that step. ■

Low Bill For Model 4 Utilities

by Hardin Brothers

★ ★ ★ ★

PRO-ESP runs on the Model 4 (64K) and requires one disk drive. Misosys Inc., P.O. Box 239, Sterling, VA 22170-0239. 703-450-4181. \$24.95.

Easy to use: ★ ★ ★ ★ ☆

Good docs: ★ ★ ★ ☆ ☆

Bug free: ★ ★ ★ ☆ ☆

Does the job: ★ ★ ★ ★ ☆

Utility packages are generally a good deal. You might not use all the programs they contain, but you usually get your money's worth from the ones you do use. While some of PRO-ESP's 16 programs are similar to those in other utility packages, others are unique. The package represents an excellent value and belongs in any serious Model 4 owner's utility library.

Special K

The first program in the package, ALTDISK, is an alternative to TRSDOS 6's Memdisk program. It creates a RAM disk either in the entire upper 64K of memory or in the lower half of that bank and provides slightly more usable space than a single-density Memdisk. ALTDISK loads and formats memory much more quickly than Memdisk and uses less of the low-memory area. Therefore, you can use ALTDISK even if you have a hard-disk driver that normally doesn't leave enough room to install Memdisk.

ALTLD is another useful program for Model 4's with the extra 64K of memory. It dumps the entire upper 64K to a disk file or loads it back from disk. This way, you can capture a complete memory disk's contents for later use.

ALTRES is the third program designed specifically for 128K machines. It places any or all of system files 1-5 and 9-12 in the upper alternate bank so that TRSDOS can call them without accessing the disk.

Smorgasboard

If your video display double-spaces during communication with a mainframe or an electronic bulletin board, CRLF/FLT will put an end to the problem. Most computers use a combination of a carriage return and a line feed character to mark the end of every line: TRS-80s use only a carriage return. To eliminate double-spaced text, the CRLF filter traps all carriage returns before they are sent to the video dis-

play and changes them to the correct beginning-of-line character that other computers transmit.

CTLG/FLT, which is installed as a video filter, sounds a tone whenever you press control-G (an ASCII BEL character). You can use it with communications programs like COMM or in your own programs.

CVT324/CMD converts Model I/III Basic programs in tokenized form to Model 4 Basic. It adds spaces around key words, converts Print@ statements to fit the Model 4's 80-character by 24-line screen, and flags questionable and impossible commands (like POKE and Set) so you can convert them to Model 4 Basic by hand.

The largest program in the PRO-ESP package lies in a disk editor called DED/CMD, which allows you to view and modify any sector on a Model 4 disk. DED tells you which file each sector belongs to as you view it but, unfortunately, is not capable of finding sectors according to file name.

Keyboard Aids And More

One of the most interesting PRO-ESP programs is DOEDIT/FLT, a keyboard filter that gives you full-screen editing at any time. To edit a line on the screen, you tap one key and move the cursor to that line. Then you can change, insert, or delete any information you want and send the line back to the system as if you had typed it in. DOEDIT is handy for correcting typographical errors in complex TRSDOS command lines and for editing Basic programs, as long as each line of Basic is limited to a single screen line.

FKEY/CMD is a very short program that allows you to change the values of the shifted and unshifted function keys. You can use FKEY/CMD to give the function keys any single ASCII value you wish, but multikey command strings aren't permitted.

IOMON/CMD is the most unusual program here. When loaded and enabled, it traps all disk errors and lets you choose whether the system should ignore the error, try the disk operation again, continue and pass the error back to the calling program, or abort to TRSDOS Ready. If you have disks that your computer can read only sporadically, IOMON could save you from unnecessary program crashes.

Filters and File Handlers

PRO-ESP also includes a Minidos filter that gives you access to several TRSDOS commands even if you're in another program. You can use it to toggle the clock display on and off, enter Debug, send a

PRO-ESP's keyboard filter, DOEDIT/FLT, gives you full-screen editing at any time.

byte to your printer, set your printer to the top of form, display a disk directory, rename a file, or kill a file.

Name/CMD, a short but convenient program, lets you easily rename or redate a floppy disk. You can rename a disk with TRSDOS's ATTRIB command, of course, but ATTRIB won't let you change its creation date.

PRTOGGLE/CMD is another PRO-ESP filter that gives TRSDOS a feature found in CP/M and MS-DOS. Once you install the filter, you can toggle your printer on and off at any time. When the printer is turned on, it displays everything sent to the video display until you toggle the filter off again.

RD40/CMD is a disk drive utility that allows 80-track drives to read 40-track disks. As with all such utilities, however, you can use it read a 40-track disk but not to write to one.

Almost everyone accidentally erases an important disk file from time to time. Unremove/CMD will recover an erased file if its sectors haven't been overwritten by another file or program. If the file can't be recovered, Unremove reports an error and aborts.

The last program in the package is a filter for the COM driver called XONX-OFF/FLT. It lets you to use your computer with serial devices (modems, printers, plotters, and so on) that demand an XON/XOFF control protocol. The filter will operate correctly regardless of baud rate, parity, or word size settings.

Conclusion

Most of the PRO-ESP programs seem to be well planned and bug free. I found one command in the disk editor that wouldn't work, and I discovered that the Minidos filter has a bad bug that locks up the computer if you try to access a disk drive that doesn't contain a disk. Aside from these two problems, I like this package very much. Its low cost makes it a good buy even if you use only a few of the programs it contains. ■

MS-DOS On the Menu

by David Engelhardt

★ ★ ★ ★ ★

1dir (version 3.5) runs on the Tandy 1000/1200/3000 (256K) and requires one disk drive (two recommended) and MS-DOS 2.x. Bourbaki Inc., P.O. Box 2867, Boise, ID 83701. 208-342-5849. \$95.

Easy to use: ★ ★ ★ ★ ★
 Good docs: ★ ★ ★ ★ ★
 Bug free: ★ ★ ★ ★ ★
 Does the job: ★ ★ ★ ★ ★

★ ★ ★

Starbridge DOS runs on the Tandy 1000/1200/3000 (256K) and requires two disk drives. Starbridge Technologies, 1925 Century Park East, Suite 1330, Los Angeles, CA 60067. 213-277-8324. \$49.95.

Easy to use: ★ ★ ★ ☆ ☆
 Good docs: ★ ★ ☆ ☆ ☆
 Bug free: ★ ★ ☆ ☆ ☆
 Does the job: ★ ★ ☆ ☆ ☆

Like any command-driven program, MS-DOS makes the user do most of the work—it displays that abrupt A > prompt and waits for you to type in something meaningful. 1dir and Starbridge DOS are DOS-shell programs that come between you and the operating system, providing a friendlier environment. Both programs let you access files and enter DOS commands from a menu, usually with one keystroke. Although the two programs attempt the same thing, their approaches differ. I thoroughly recommend 1dir, but I found Starbridge quirky and had a few problems with it.

1dir

1dir is packed with features. Think of any function that this kind of utility should do, and 1dir probably does it, and more. The utility takes the hassle out of entering DOS commands and managing files. Its options program allows you to build custom menus and commands. With 1dir's Batch Builder, you can create batch files without a word processor or text editor.

1dir is a memory-resident program that patches itself into the operating system. The program disk contains two batch files that do most of the installation. The main installation file creates a root directory in the drive you choose and copies the necessary menu and option files to it. The second batch file, which is optional, installs the Help menu files in the root directory. It is important to note

Continued on p. 111

“I am amazed at the broad spectrum of technical articles you publish, for both novice and advanced programmers . . .”



If you're still wondering which magazine you should buy for your TRS-80*, here's what **80 Micro** readers have to say about their #1 system-specific information source —

●“Not only is the magazine very professionally done, but I have found something in almost every issue that has been worth the price of the subscription . . .”

*Roger L. Holstege
Millersville, MD*

●“I was greatly impressed by your magazine. I got more useful information from that one issue of **80** than I have from countless other sources . . .”

*John M. Crittenden
Jackson, MS*

●“I have found **80 Micro** to be the most valuable magazine pertaining to home computers on the market . . .”

*William C. Hardin, Jr.
Charlotte, NC*

80 Micro is the magazine for every TRS-80 user—from beginner to advanced. **80 Micro** is full of tutorials, free programs, hardware modifications, new product announcements, product reviews, debugging tips, and more.

And an **80 Micro** subscription is risk-free. *If you're not completely satisfied, you'll be reimbursed for all undelivered issues.* See what **80 Micro** can do for you. It's #1 for a lot of people. Fill out this order form and send it in now.

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

Yes! I want a no-risk subscription to the magazine for beginner to advanced TRS-80 users. Send me 12 issues of **80 MICRO** for \$24.97! I'll save 48% off the newsstand price!

Payment Enclosed Bill me

Name _____

Address _____

City _____ State _____ Zip _____

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

80micro • PO Box 981 • Famingdale, NY 11737
364B8

DiskCount Data

WHERE
QUALITY PROGRAMS
MEET COMPETITIVE PRICES

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

• 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. I or II • Electronically Speaking • Computer Communication Techniques • The Rest of 80 • Using the Z-80 in the TRS-80 •

IF YOU BOUGHT YOUR SOFTWARE ELSEWHERE, YOU'RE PROBABLY STILL WAITING.....

Join the list of thousands of our satisfied customers who know that we ship 95% of our orders within 48 hours. If we are out of a product, we'll let you know when we can ship it and won't keep you waiting. Our great prices complement our outstanding service.

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

MS DOS VERSION 79.95

THE FBN GENERAL LEDGER
Absolutely the finest G/L on the market MOD III.
RETAIL \$300.00 NOW 149.95

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
TRS-80 Disk & Other Mysteries 19.95
The Custom TRS-80 & Other Myst. 26.95
Microsoft Basic Decoded 26.95
Machine Language Disk I/O 26.95
Basic Disk I/O & Other Myst. 26.95
How To Do It On The TRS-80 26.95
TRSDOS 2.3 Decoded & Other Mys 26.95
Basic Faster & Better 26.95

Advanced Basic Faster & Better PC, 1000, 1200 19.95
Green Screens I/II/III/4/4P 16.95
Diskettes SSDD 10 in Plastic Bx. 15.00
Colored Sentinel Disks 17.00
Profile 3+ Commands Wall Chart* 4.00
Visicalc 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
How to Maintain & Service Your Computer 17.95
TRS-80 For Kids From 8 to 80 10.95
TRS-80 For Kids From 8 to 80 Vol. II. 10.95
Using the Z80 in the TRS-80 13.95
Computer Communication Techniques 15.95
Electronically Speaking (Digital Speech) 14.95
Practice Problems/Logic/Algebra 11.95
Reference Manual for Scripsit 45 Pages 7.95
*Charts not shipped as separate order

THE HOME ACCOUNTANT ONLY 54.95
By Continental Software

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 transactions, fiscal or calendar year • Transactions may be "sull" 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 just about everything you'd ask of a personal finance package! — Popular Computing, November, 1982
MOD III

SUPERDOS
Over 15 enhancements to TRSDOS 1.3 29.95
FAST/CMD
Run TRSDOS 1.3 at the high speed in Mod 4/4P/4D 29.95

OPERATING SYSTEMS

CP/M 2.2 Montezuma Mod 4 159.95
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
Dopplus 4A With M-ZAL 114.95
Dopplus 3.5 I/III 54.95
Multidos 1.71 I/III 79.00
Multidos 80/64 89.95

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

APPLICATIONS

Macro Typing Tutor I/III/4 39.95
ST-80 III 69.95
Masterdirectory Mod III 29.95
Superdirectory Mod III/4 44.95
Datagraph I/III/4/Max 69.50
Datagraph Pie Chart Option 29.95
The Basic Checkbook I/III 64.95
Mterm I/III/4 59.50
Loan Amortization III 29.95
PowerMail Plus I/III/4 94.95
Text-Merge for PowerMail 49.95
PowerMail w/Text-Merge 124.95
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 I 150.00
SPS as above for Mod III inquire

UTILITIES

J&M Memory Minder I 84.95
J&M Memory Minder III/4 74.95
The Toolbox for LDOS 44.95
LC Compiler/EDAS I/III or 4 124.95
ALCOR C-Complete System 83.95
ALCOR Multi-Basic Compiler 83.95
AOS Superkeys Key Macros Mod III/35.00
6.2 Plus. (Enhance TRSDOS 6.2) 36.95
The Toolbelt Mod 4 44.95
AOS Utils #1 Varkeep/Scrnprkr 49.95
Pascal-80 Mod I/III 59.95
MRAS/Pro-MRAS 69.95
Pro-Create Mod 4 74.95
Pro-Duce Mod 4 24.95
The Creator Mod I/III/MSDOS 44.95
Pro-LC Mod 4 124.95
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 24.95
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 79.50
T/Maker Mod 4/4P/4D 219.95

SUPER UTILITY PLUS SALE
By POWERSOFT
VOTED AS THE OUTSTANDING UTILITY BY 80-MICRO READERS

DATA BASES AND INFORMATION MANAGERS

AUTO FILE MANAGER
The newest entry in full fledged data bases is Powersoft's Auto File Manager (AFM). It incorporates total screen flexibility, form letter output, fully relational look up and custom report generation with mathematical functions. This remarkable new product from the SuperUtility boys is priced at a low \$94.95. Model I/III 4/4P/III Mode).

INFOSCAN
If you need a super fast screen oriented information manager with fixed windows and 1 second lookup by keyword, then this little jewel is for you. Infoscan files can have different information in each record and each record can have it's own form. Very simple to use. Mod I/III or 4/4P/III Mode) \$44.95 on sale.

PROTECTED MEDIA BUY SUPERUTILITY PLUS
3.2 FOR MOD I/III OR 4/4P FOR MOD 4/4P 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

WINDOWS ON MOD 4
NOW PRO-INTO FROM MISOSSYS ALLOWS MODEL 4 USERS TO CREATE AND USE WINDOW OVERLAYS ON THE MOD 4 SCREEN AT THE TOUCH OF A SINGLE KEY. COMES COMPLETE WITH THE WINDOWING UTILITY, ROTATING INDEX FILE, ADDRESS FILE, APPOINTMENT SCHEDULER, CALENDAR 2 CALCULATORS, CARD FILER, NOTEPAD, PHONE LIST & AUTO DIALER, AND A MINI TERMINAL. A TRULY INCREDIBLE SOFTWARE SET FOR ONLY \$4.95
Requires 128K MOD 4 & TRSDOS 6.2

WORD PROCESSORS & PRINTER DRIVERS

Electric Pencil I/III 74.99
Lazy Font I/III/4 44.95
M-Script I/III/4 53.50
LeScript I/III/4/Max 104.95
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 Scripsit I/III/4 34.95
NOTE: If your printer driver is not listed, call, we have more.

ELECTRONIC BULLETIN BOARDS
COMPLETE SYSTEMS
BBS-80 MOD I or III (for floppies) 74.95
INFOEX-80 I or III (will run on hard disk) 99.95
BBS-PC IBM or compatibles 250.00
Call for additional details

SCHOOL UTILITY AND EDUCATIONAL

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

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

TRSDOS-MSDOS-CPM HUGE SALE ON CONVERSION UTILITIES

CONVERT BASIC 29.95
SUPERCROSS/XT 90.00
SUPERCROSS/XT W/CONVBASIC 99.95
HYPERCROSS/XT 2.0 90.00
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 1DD, MOD III, MOD 4

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 29 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 detail. Specify Mod III, Mod 4, 4P or 4D when ordering
WAS \$299.95 REDUCED TO \$189.95 SALE \$189.95

MSDOS SOFTWARE

RAMDISK for your PC or MSDOS compatible. Now you can define a virtual disk drive all in memory and you can make it any size you want. A terrific software package at only \$29.95.
Inventory Control (ICS) 69.95
Call us for all of your MSDOS software needs. IBM-PC, TANDY 1200/1000, Leading Edge PC, etc. We have thousands of programs available at great prices.

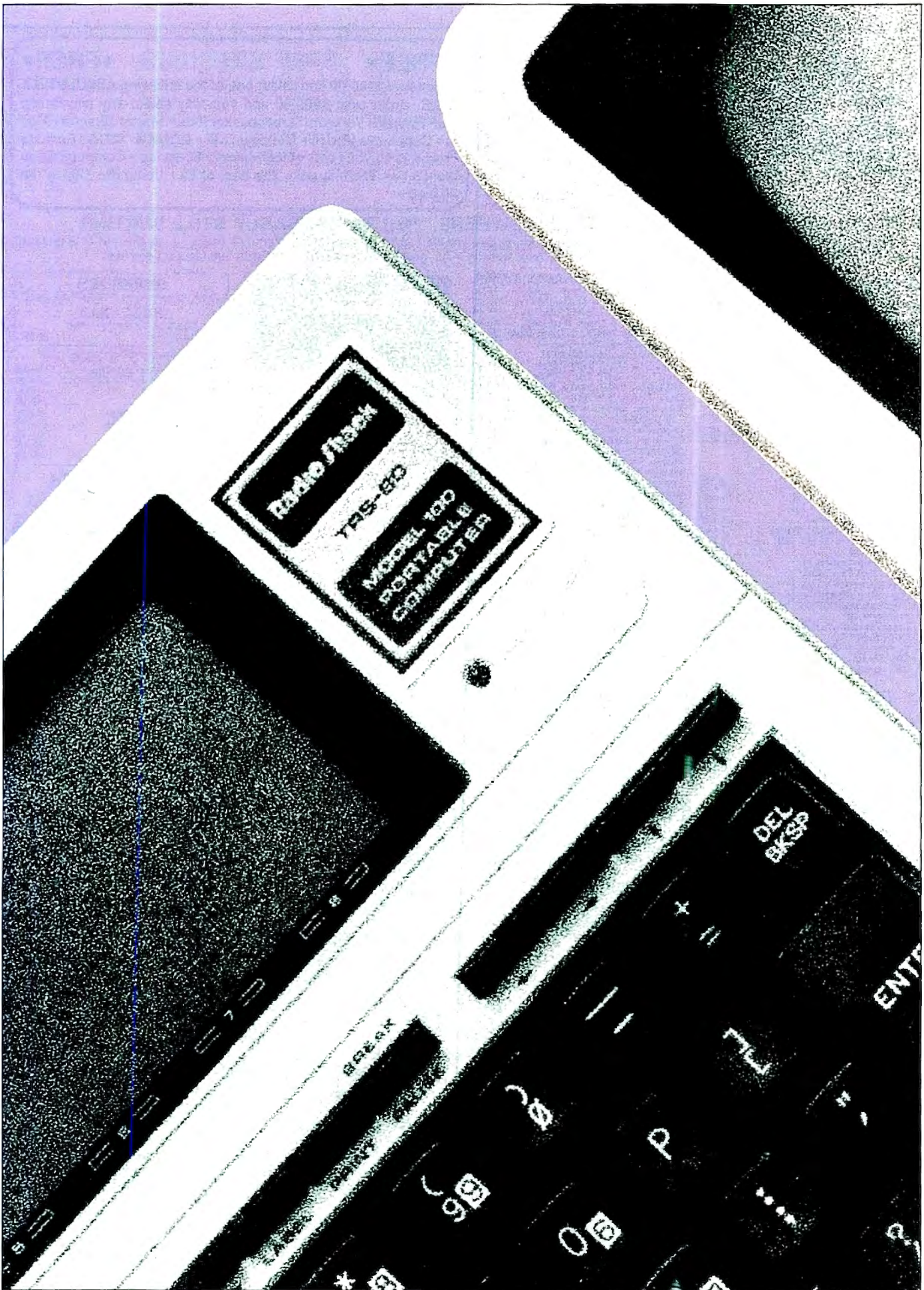
HI-RES SOFTWARE

3D PLOT 39.95
MATHPLOT 39.95
BASICE 39.95
SLIDESHOW 19.95
PCHAR 14.95
DRAW 39.95
BIZGRAPH was 98.00 now 75.00
LET'S WRITE MUSIC 49.95
XT.CAD 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 REVERS! now 29.95
3-D TIC TAC TOE now 19.95

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 \$4.00 for Parcel Post & 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 model number.
Phone Your Order In Today Or Mail To:
DISKCOUNT DATA, 2701-C WEST 15th, SUITE 612, PLANO, TX 75075

MasterCard and VISA Cheerfully Accepted



Photograph by Edward Justice

THE SMARTEST PERIPHERAL



Most Model 100 owners are getting only part-time help from their briefcase computers. The portable might be indispensable for dashing off letters and notes on the road, but back home or at the office, it usually sits idle. That's a waste of its potential.

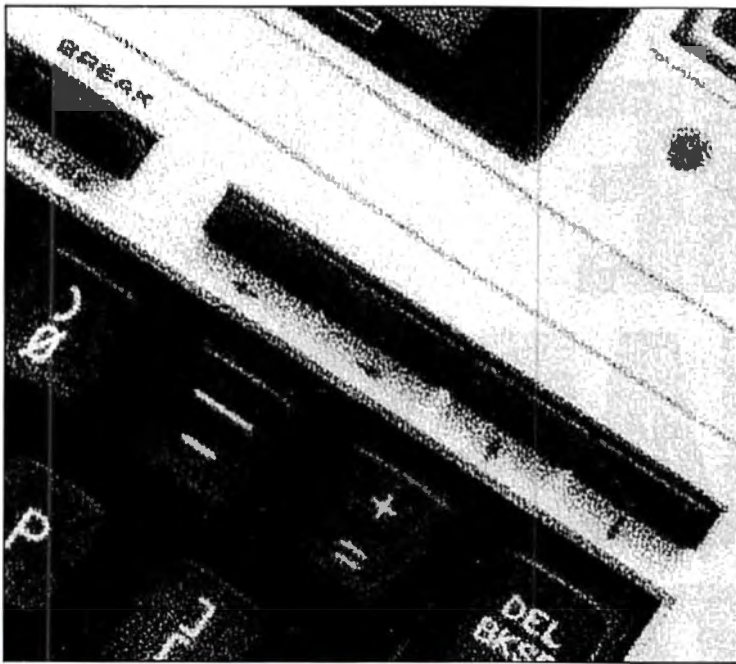
We found a way to put the 100 to work full time—as an intelligent peripheral teamed with a desktop computer. In the following pages, programmers Thomas Quindry and John Wolfskill discuss two applications, called Export and Sideport, that give the portable a more productive role at home.

Quindry's Export (p. 36) converts the Model 100 into a printer buffer. With his program and a minimal investment in cable attachments, you can use the Model 100 to print out text files up to 28K in length while running other tasks on your Model III or 4.

Wolfskill's Sideport (p. 42) allows the Models 4 and 100 to work side by side in the same application. You can display Model 100 files in a buffered window on the Model 4's screen, write files to the 100 from the 4, and even turn the portable into a desktop organizer with notepad and calculator functions.

These are just two examples of the kind of routine service you can derive from the briefcase computer with a bit of creative thinking. It's time the Model 100 did something more than tag along on business trips.

**The Model 100
doubles as a printer
buffer or desktop
organizer for the
Model 4.**



EXPORT

by Thomas L. Quindry

creates a printer buffer in the Model 100, which you can use to print out text while running other tasks on the Model 4. Though the buffer size depends on the amount of free memory in the Model 100, it can be as large as 28K. With Export, I was able to send the 11K file containing this article to the Model 100 for printing and get back control of the Model 4's cursor in 19 seconds.

Program Listing 1 contains the source code for Export.CO. If you don't have an editor/assembler, use the Basic code in Program Listing 2 to create Export.CO. You will also need a null modem cable or adapter to connect the computers through their serial ports, and a Model 100 parallel printer cable. (You can purchase a null modem cable at Radio Shack Computer Centers for about \$20, or you can construct one—see Related Articles on p. 37. Consult next month's article "Transfer Points" for instructions on building a null modem adapter.)

To transfer data from the Model 4 to the Model 100, you'll need to establish XON/XOFF handshaking between the computers. I've written XOFF/CMD, a flow-control interrupt program that adds this capability to COM/DVR, the RS-232 serial driver provided with TRSDOS 6.x (see Program Listing 3). Think of XOFF as a busy signal and XON as a not-busy signal. XOFF/CMD monitors input data from the RS-232 and waits for the proper signal (XON) before instructing the Model 4 to begin transmitting data to the printer buffer.

Preparing the Text

To set up the Model 4, attach the cables and enter these commands in sequence:

```
SET *CL TO COM/DVR
SETCOM (BAUD = 9600,WORD = 8,PARITY = N)
ROUTE *PR TO *CL
XOFF/CMD
```

Then run your application program and prepare your document. When you are ready to print, run Export on the Model 100. This opens the buffer file and establishes communication between the two computers.

On the Model 100's display, you will see the prompt "CRLF?". Type in Y if you have a printer that requires a line feed after each carriage return. If you already specified this in the application program, don't give the same instruction twice. Answer no to Export if you said yes to the application program's prompt, and vice versa.

I have tested Export with Model 4 Scriptit, LeScript, Allwrite, and the printing functions of Radio Shack's Model III EDT-ASM as modified for use with the Model 4 (see Related Articles). If you are using LeScript, remember to enter the printer control command (R8) before the first line of your text. With Allwrite, you must type in ALINSTAL to select your printer and indicate that you are supplying the printer driver.

If you are using Model 4 Scriptit, press the P key to instruct the Model 4 to begin sending characters via the RS-232 and null modem cable to the printer buffer. While the data is transferring, the Model 4's cursor disappears from the screen; when it reappears, the transfer is complete. If your printer is turned on, printing begins as soon as data enters the buffer. You may, however, keep your printer off line until the buffer has filled, which increases the data transfer speed.

Buffer Zone

Export creates the printer buffer by opening a phantom file in the Model 100's directory. Although you never access this file, be sure to leave space for it in the directory. If you try to run Export in a full directory, you will receive the error message "?FL error." To recover, type in MENU. This returns you to the Model 100's menu, from which you can run Export again.

Other Export error messages you might encounter are "OM error" and "RS232 error." You can recover from either one by pressing any key on the Model 100. The first error occurs if fewer than 256 bytes of free memory are available for the printer buffer.

Although the buffer may be as small as 256 bytes, Export loses some of its efficiency with any buffer under 5K. Ideally, the buffer should be large enough to contain all of the data you want to print. If the buffer is smaller than your text file, you may still print, but the data transfer rate will proceed at a slower rate.

An RS-232 error occurs if you have not set the appropriate baud rate on the Model 4. Export requires a baud rate setting of 9,600 bits per second (bps), which translates to about 1,200 characters per second.

Export contains a number of safeguards to ensure that the existence of the phantom file will not cause your computer to crash. For example, let's say you inadvertently press the reset button while you are printing your text. If the newly created phantom file space contained an end-of-file character—ASCII 1A hexadecimal (hex)—your computer would crash, causing a cold restart and the loss of all your files. To prevent this from happening, Export opens the phantom file to its maximum size and fills the printer buffer with spaces.

Export also intercepts inappropriate ASCII 1A hex characters, which some applications programs use as printer-control codes instead of as end-of-file markers. Whenever the program receives an ASCII 1A hex, it waits until all of the text has printed before calling up the Model 100 ROM routine that erases the phantom file from the directory.

When Export creates the phantom file, it names it with graphics characters in order to eliminate the possibility of overwriting another file. If you exit Export unnaturally during the printing process (by inadvertently pressing the reset button or crashing the program), you'll see the

graphics characters used to name the phantom file on the Model 100's menu. In this case, kill the file by running Export again. When you see the prompt "CRLF?", answer Y or N, as you did on startup. Pressing shift-print will then return you to the Model 100's menu with the file killed.

You could also kill the file by entering Basic and typing in the command:

```
KILL "GRPH-T GRPH-L GRPH-Q.DO"
```

Up to Speed

Although the baud rate setting for the Model 4 is 9,600 bps, Export transfers data from the Model 4 to the printer buffer at an actual rate of 5,000 bps while the printer is turned off. During printing, the transfer rate is about 3,000 bps.

If your text is larger than the available space in the buffer, the transfer rate will be further slowed, as the program must print text from the filled buffer in order to make room for more to enter. This means that data transfer can occur only as fast as your printer prints characters to the page. Mine operates at about 110 characters per second (approximately 900 bps).

A 22K file will usually fill the 28K buffer. Characters required for margins, line feeds, and other formatting specifications account for the remaining 6,700 bytes. If your printer is turned on when the Model 4 begins transferring characters, such a file would take about 75 seconds to fill the buffer. If you leave your printer off line while the data is transferring, the file will fill the buffer in about 45 seconds (assuming that your text file is no larger than the available buffer space).

To return to the Model 100's menu, press shift-break. Doing so before the program has finished transferring your data will send an XOFF signal to your Model 4, and the computer will appear to hang up. In fact, it's just waiting for the XON signal to tell it to continue transmitting. To recover, run TELCOM on the Model 100 and send an XON signal by pressing control-Q. You could also press the reset button on the Model 4 to regain control.

If you have more than one text file to transmit, Export appends any new files you specify to the end of the last one in the printer buffer. When the program has transferred all of your data, the cursor reappears on the Model 4's screen, and you can begin another task.

Portable Power

Export lets you take advantage of the Model 100's static RAM capability. If you turn off the portable while it is running Export, the computer will suspend execution. The next time you turn on the computer, it will pick up where it left off.

Let's say you don't have a printer at home, or you have a better one with a parallel interface at the office. With the feature I've just described, you could transfer a text file from your Model 4 to the Model 100 at home using Export. Then turn the computers off, detach the null modem ca-

ble, and take the portable into your office to print the file. Attach the 100 to your office printer via the parallel printer cable and activate the printer. When you turn on the Model 100, your text will print. Make sure, however, that everything is adjusted properly, since you have only one shot at printing.

Export will work with any computer that provides the proper XON/XOFF handshaking via the RS-232. If you do not have an editor/ assembler for Listing 3, you can purchase XON/XOFF filters for Model IIIs running LDOS and Model 4s running TRSDOS 6.x from Misosys (see Product Information below).

If you choose to buy an XON/XOFF utility for the Model III and use Export with Model III Scripsit, you must install a patch to make the word processor honor the high-memory pointer. For Scripsit 3.2, the patch is as follows:

```
PATCH SCRIPSIT/CMD (ADD = 5327, FIND =  
77AE20F9, CHG = 002A1144)
```

For Scripsit 3.1, the patch is:

```
PATCH SCRIPSIT/CMD (ADD = 5241, FIND =  
77AE20F9, CHG = 002A1144)
```

After you've made these patches to Scripsit, use the P,S command to move data to the printer buffer. You don't need to apply the patch to LDOS-modified versions of Scripsit, as they already honor the high-memory pointer.

Export is not limited to use with word processors and spreadsheets. Basic's LLIST and LPRINT will also work with the program, as will the printing utility in TRSDOS. ■

Thomas L. Quindry writes frequently for 80 Micro. Contact him at TLQ Enterprises, 6237 Windward Drive, Burke, VA 22015.

Product Information

Misosys offers two XON/XOFF filters, which you can use in place of Program Listing 3. For a Model 4 under TRSDOS 6.x, Misosys offers the PRO-ESP utility package for \$29.95 plus \$2 shipping. For the Model III, it offers the MSPO2 utility package for \$24.95 plus shipping. MSPO2 is a discontinued product, which Misosys will continue to ship while supplies last. Contact Misosys Inc. at P.O. Box 239, Sterling, VA 22170, 703-450-4181.

—Thomas L. Quindry

Related Articles

Balonis, Ronald F., "Pin Pals," February 1984, p.194. Transferring Basic and Text files between two Model 100s with a home-made cable.

Payne, Douglas, "Model 4 EDTASM for Free," August 1984, p. 42. Modifying Radio Shack's Model III EDTASM for the Model 4.



System Requirements

Model 100 (with 8K RAM)

Model 4

TRSDOS 6.x

Editor/assembler

Null modem cable

Model 100 parallel printer cable

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 or 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 ()

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 - 303-637-1442
Call or Write for our complete catalog of products.

ALPS
1502 County Road 25
Woodland Park, Colorado 80866
800-232-ALPS (Toll-Free)

Put a Green CRT in Your TRS-80

Regularly \$99.95

WHILE THEY LAST

Amber—\$59.95

Reg.—\$99.95

Don't forget about our quality
Amber tubes for other models
\$99.95

For Tandy Models I, III, 4, 1000,1200,
2000

Warranted for one full year against man-
ufacturing defects or tube failure.

Comes with a 30-day money back guar-
antee.

Langley-St. Clair

Instrumentation Systems, Inc.
132 W. 24th St., New York, NY 10011

Call now to order your 'Soft-View™' CRT

800 221-7070

In New York call 212 989-6876

Program Listing 1. Export.CO

```

00100 ;*****
00110 ;*
00120 ;* EXPORT.CO
00130 ;* BY THOMAS L. QUINDRY
00140 ;* JANUARY 15, 1986
00150 ;*
00160 ;* MODEL 100 PRINTER BUFFER
00170 ;* FOR USE AS A SMART PERIPHERAL
00180 ;* WITH OTHER COMPUTERS
00190 ;*
00200 ;* ION/XOFF FLOW CONTROL REQUIRED
00210 ;*
00220 ;* VERSION 2.0
00230 ;*
00240 ;*****
00250 ;
00260 ;PROGRAM MUST NOT CORRUPT MEHORY BEYOND DF5FH
00270 ;
00280 ORG 0F4A8H
00290 LD HL,CRLF ;WANT LF W/CRF?
00300 CALL 27B1H ;DISPLAY MESSAGE
00310 CALL 12CBH ;GET KEYBOARD RESPONSE
00320 AND 0DFH ;RESET BIT 5
00330 CP 'Y'
00340 JP Z,DISP ;GO IF YES
00350 LD A,0C9H ;ELSE ANSWER IS NO
00360 LD (PRINT2),A ;PUT RETURN CODE HERE
00370 LD A,'N'
00380 RST 20H ;DISPLAY ANSWER
00390 LD A,0DH ;PRINT <CR>
00400 RST 20H
00410 LD HL,0F65BH ;GET CURRENT COMH STAT
00420 LD DE,CRLF+1 ;WILL STORE IT HERE
00430 LD B,05
00440 CALL 2542H ;MOVE 5 CHARACTERS TO DE
00450 LD HL,INIT
00460 SCF ;CARRY FLAG MUST BE SET
00470 CALL 17E6H ;INITIALIZE RS232
00480 LD B,9 ;NO BYTES TO MOVE
00490 LD HL,FILNAM ;PUT INTO DE LOCATION
00500 LD DE,0FC93H ;FILENAME BUFFER
00510 CALL 2542H ;MOVE HL TO DE
00520 CALL 220FH ;CREATE .DO FILE
00530 PUSH DF ;SAVE FOR ENDTXT
00540 PUSH HL ;SAVE FOR ENDTXT
00550 JP NC,OK ;NEW FILE?
00560 CALL KILL ;KILL OLD FILE
00570 JP CREATE ;CREATE FILE AGAIN
00580 LD BC,7000H ;EXPAND LENGTH UP TO 28K
00590 PUSH BC
00600 PUSH HL
00610 CALL 6R6DH ;EXPAND FILE ROUTINE
00620 POP HL
00630 POP BC
00640 JP NC,DONE
00650 DEC B ;REDUCE SIZE IF NECESSARY
00660 JP NZ,SIZE
00670 PUSH BC
00680 LD HL,OM ;NOT ENOUGH MEM FOR FILE
00690 JP DISPLA ;DISPLAY MESSAGE
00700 PUSH BC ;SAVE FOR ENDTXT
00710 PUSH BC
00720 PUSH HL
00730 LD (OM),HL ;SAVE FOR PRINT ROUTINE
00740 LD A,20H ;FILL FILE WITH SPACES
00750 LD (HL),A ;(SAFETY FACTOR)
00760 INC HL
00770 DEC BC
00780 LD A,B
00790 OR C
00800 JP NZ,SPACES
00810 POP HL
00820 POP BC
00830 LD A,B ;CHECK IF TEXT FULL
00840 OR C
00850 JP Z,PRINT ;FILE FULL
00860 CALL 729FH ;CHECK FOR SHIFT-BREAK
00870 JP C,ENDTXT ;DETECTED
00880 CALL 6D6DH ;CHECK RS232 QUEUE
00890 JP Z,PRINT ;NO CHAR TO RECEIVE
00900 CALL 6D7EH ;GET CHARACTER FROM QUEUE
00910 JP C,ENDTXT ;SHIFT-BREAK DETECTED
00920 JP NZ,ERR ;TRANSMISSION ERROR
00930 LD (HL),A ;PUT CHAR IN FILE
00940 INC HL ;INCREMENT COUNTER
00950 INC DE
00960 DEC BC ;BYTES LEFT IN FILE
00970 JP SIZED
00980 LD HL,RSERR ;RS232 ERROR MESSAGE
00990 DISPLA CALL 27B1H ;DISPLAY STRING
01000 CALL 12CBH ;WAIT FOR KEYBOARD CHAR
01010 ENDTXT POP BC
01020 POP HL
01030 PUSH HL
01040 CALL 6B9FH ;GET RID OF ALL BYTES
01050 CALL KILL
01060 LD HL,CRLF+1 ;GET COMM STAT
01070 LD A,(HL)
01080 CP 4DH ;'M' FOR MODEN?
01090 JP NZ,RESTOR
01100 INC HL
01110 RESTOR CALL 17E6H ;RESTORE TO ORIGINAL STAT
01120 JP 0000
01130 KILL POP RC
01140 POP DF

```

Listina 1 continued

Listing 1 continued

```

01150      POP      HL
01160      PUSH     BC
01170      CALL     1FBEH      ;KILL EXISTING FILE
01180      RET
01190 PRINT  LD      F,A      ;SAVE "A REG" VALUE
01200      IN       A,(0BBH) ;CHECK PRINTER STATUS
01210      AND      06H
01220      XOR      02H
01230      LD      A,E      ;RETURN "A REG" VALUE
01240      JP      NZ,SIZED ;PRINTER BUSY
01250      PUSH     HL
01260      LD      HL,(OM)   ;GET TOP OF FILE POINTER
01270      PUSH     HL
01280      POP      DE      ;PUT IN DE
01290      POP      HL
01300      PUSH     HL      ;SEE IF HL ==> TOP
01310      DEC     HL
01320      CALL     SBC      ;SUBTRACT DE FROM HL
01330      POP      HL
01340      JP      C,SIZED
01350 PRINT3 PUSH     HL      ;CHECK FOR EOF
01360      DEC     HL
01370      CALL     SBC      ;SUBTRACT DE FROM HL
01380      POP      HL
01390      JP      NC,PRINT1 ;NOT EOF
01400      LD      HL,(OM)   ;RESET FILE POINTER
01410      JP      SIZED
01420 PRINT1 LD      A,(DE)   ;GET CHARACTER TO PRINT
01430      INC     DE      ;INCREMENT POINTERS
01440      INC     BC
01450      CP      0DH      ;SEE IF <CR>
01460      PUSH     AF      ;SAVE FLAG
01470      CALL     Z,PRINT2 ;PRINT CRLF IF SELECTED
01480      CALL     6D3FH    ;PRINT CHARACTER
01490      POP      AF      ;GET FLAG
01500      JP      NZ,PRINT3 ;CONTINUE IF NOT <CR>
01510      PUSH     BC      ;REMOVE PRINTED CHARS
01520      CALL     SBC      ;AND RECTIFY FILE
01530      PUSH     HL
01540      POP      BC
01550      INC     BC      ;NEED ONE MORE COUNT
01560      LD      HL,(OM)   ;GET TOP OF FILE
01570 MOVE  LD      A,(DE)   ;MOVE CHARACTERS
01580      LD      (HL),A   ;FROM DE TO HL
01590      INC     HL
01600      INC     DE
01610      DEC     BC
01620      LD      A,B
01630      OR      C
01640      JP      NZ,MOVE   ;CONTINUE TO MOVE CHARS
01650      POP      BC      ;GET FILE LENGTH BACK
01660      DEC     HL      ;NEED ONE LESS COUNT
01670      JP      SIZED
01680 SBC   SCF      ;SET CARRY FLAG
01690      CCF      ;COMPLEMENT (NO CARRY)
01700      LD      A,L      ;SUBSTRACT E FROM L
01710      SBC     A,E      ;CARRY FLAG NOT SET
01720      LD      L,A      ;PUT IN L
01730      LD      A,H      ;SUBSTRACT D FROM H
01740      SBC     A,D      ;ACCOMT FOR CARRY
01750      LD      H,A      ;PUT IN H
01760      RET      ;DE SUBTRACTED FROM HL
01770 PRINT2 CALL     6D3FH ;PRINT CRLF
01780      LD      A,0AH
01790      RET
01800 FILNAM DEFEB 252      ;CTRL-T
01810      DEFEB 249      ;CTRL-L
01820      DEFEB 231      ;CTRL-Q
01830      DEFEB ' DO'   ;THREE SPACES BEFORE "DO"
01840      DEFEB 0
01850 INIT  DEFEB '88N1E'
01860      DEFEB 0
01870 OM   DEFEB 'OM ERROR'
01880      DEFEB 0
01890 RSERR DEFEB 'RS232 ERROR'
01900      DEFEB 0
01910 CRLF  DEFEB 'CRLF? '
01920      DEFEB 0
01930      END     START

```

End

Program Listing 2. Export.BA

```

10 CLS:CLEAR50,626321
20 PRINT:PRINTTAB(11)"Loading EXPORT.CO"
25 PRINTTAB(14)"Version 2.0"
30 PRINTTAB(7)"A Smart Peripheral Progra
m"
40 PRINTTAB(19)"By"
50 PRINTTAB(11)"Thomas L. Quindry":PRINT
60 FORN=626321TO62959:READA:POKEN,A:CK=C
K+A:NEXT
70 READA:IFCK<>ATHENPRINT"Checksum erro
r, check DATA statements":END
80 PRINTTAB(8)"EXPORT.CO has been saved"
90 PRINTTAB(8)"EXPORT.BA can be killed"
100 PRINTTAB(4)"Himem must be protected
to 62632"
110 SAVEM"EXPORT.CO",626321,629591,62632
!
1000 DATA33, 233, 245, 205, 177, 39, 205
, 203, 18, 230
1010 DATA223, 254, 89, 202, 191, 244, 62
, 201, 50, 191

```

Listing 2 continued

Moving?

Subscription Problems?

Get help with your subscrip-
tion by calling our new toll free
number:

1-800-227-5782

between 9 a.m. and 5 p.m.
EST, Monday-Friday.

If possible, please have your
mailing label in front of you as
well as your cancelled check
or credit card statement if you
are having problems with pay-
ment.

If moving, please give both
your old and new addresses.

Hey!

Remember to
mention that you
saw their ad in
80 Micro

Thanks. . . .

TKO
Master Utility
 Four powerful functions to complement your every activity. TKO 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, jump 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 TKO, you owe it to yourself to give it a try today! (for Model 4/4P/4D with TRSDOS 6.x)
 check here to order **TKO** @ \$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 of aep
 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

TRS cat
 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
 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 SYMB (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 US 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
 • (604) 688-5009 •
SOTA Computing Systems Limited
TRS-BBS & TRSDOS are registered trademarks of Radio Shack.

Listing 2 continued

1020 DATA245, 62, 78, 231, 62, 13, 231, 33, 91, 246
 1030 DATA17, 234, 245, 6, 5, 205, 66, 37, 33, 206
 1040 DATA245, 55, 205, 230, 23, 6, 9, 33, 197, 245
 1050 DATA17, 147, 252, 205, 66, 37, 205, 15, 34, 213
 1060 DATA229, 210, 238, 244, 205, 91, 24, 5, 195, 213, 244
 1070 DATA1, 0, 112, 197, 229, 205, 109, 107, 225, 193
 1080 DATA210, 6, 245, 5, 194, 241, 244, 197, 33, 212
 1090 DATA245, 195, 60, 245, 197, 197, 22, 9, 34, 212, 245
 1100 DATA62, 32, 119, 35, 11, 120, 177, 194, 12, 245
 1110 DATA225, 193, 120, 177, 202, 99, 24, 5, 205, 159, 114
 1120 DATA218, 66, 245, 205, 109, 109, 20, 2, 99, 245, 205
 1130 DATA126, 109, 218, 66, 245, 194, 57, 245, 119, 35
 1140 DATA19, 11, 195, 24, 245, 33, 221, 245, 205, 177
 1150 DATA39, 205, 203, 18, 193, 225, 229, 205, 159, 107
 1160 DATA205, 91, 245, 33, 234, 245, 126, 254, 77, 194
 1170 DATA85, 245, 35, 205, 230, 23, 195, 0, 0, 193
 1180 DATA209, 225, 197, 205, 190, 31, 20, 1, 95, 219, 187
 1190 DATA230, 6, 238, 2, 123, 194, 24, 2, 45, 229, 42
 1200 DATA212, 245, 229, 209, 225, 229, 4, 3, 205, 182, 245
 1210 DATA225, 218, 24, 245, 229, 43, 205, 182, 245, 225
 1220 DATA210, 141, 245, 42, 212, 245, 19, 5, 24, 245, 26
 1230 DATA19, 3, 254, 13, 245, 204, 191, 245, 205, 63
 1240 DATA109, 241, 194, 126, 245, 197, 2, 05, 182, 245, 229
 1250 DATA193, 3, 42, 212, 245, 26, 119, 35, 19, 11
 1260 DATA120, 177, 194, 167, 245, 193, 4, 3, 195, 24, 245
 1270 DATA55, 63, 125, 155, 111, 124, 154, 103, 201, 205
 1280 DATA63, 109, 62, 10, 201, 252, 249, 231, 32, 32
 1290 DATA32, 68, 79, 0, 56, 56, 78, 49, 69, 0
 1300 DATA79, 77, 32, 69, 82, 82, 79, 82, 0, 82
 1310 DATA83, 50, 51, 50, 32, 69, 82, 82, 79, 82
 1320 DATA0, 67, 82, 76, 70, 63, 32, 0, 4, 59571

End

Program Listing 3. XOFF/CMD

```

00100 ;*****
00110 ;*
00120 ;* XON/XOFF FLOW CONTROL INTERRUPT FOR *CL *
00130 ;* MODEL 4 TRSDOS 6.X *
00140 ;*
00150 ;* BY THOMAS L. QUINDRY *
00160 ;*
00170 ;* JANUARY 9, 1986 *
00180 ;*
00190 ;*****
00200 ;
00210 REGIN ORG 3000H
00220 LD HL,SIGNON ;SIGNON MESSAGE
00230 LD A,10
00240 RST 40
00250 LD HL,0 ;GET CURRENT HIMEM
00260 LD B,L
00270 LD A,100
00280 RST 40
00290 JR NZ,NONEM
00300 EX DE,HL ;DESTINATION ADDRESS TO DE
00310 LD HL,INT-INTEND
00320 ADD HL,DE
00330 LD (RELO1),HL ;ADDRESSES TO RELOCATE
00340 DEC HL
00350 DEC HL
00360 LD (RELO2),HL
00370 PUSH DE
00380 LD DE,4C43H ;SAVE CURRENT HIMEM
00390 LD A,82 ;FIND DCB FOR *CL (DE='LC')
00400 RST 40
00410 JR NZ,ERRR ;CAN'T FIND DCB
00420 LD (DCB),HL
00430 EX DE,HL ;PUT DCB INTO DE
00440 LD IY,INT ;POINT TO INTERRUPT ROUTINE
00450 EQU S-2
00460 LD C,04 ;SET @CTL INTERRUPT
00470 LD A,05
    
```

Listing 3 continued

Listing 3 continued

```

00480      RST      40
00490      POP
00500      LD       HL,INTEND      ;GET HIMEM
00510      LD       BC,LENGTH      ;LAST BYTE OF INTERRUPT ROUTINE
00520      LDDR
00530      FX       DE,HL
00540      LD       A,100          ;SAVE NEW HIMEM
00550      RST      40
00560      LD       HL,0          ;CLEAR ERROR FLAG
00570      RET
00580      NOHEM   LD       HL,MEMERR
00590      LD       A,12
00600      RST      40
00610      LD       HL,-1        ;INDICATES EXTENDED ERROR
00620      RET
00630      MEMERR  DEFB      0AH
00640      DEFB      'High memory is not available'
00650      DEFB      0DH
00660      ERROR   LD       HL,ERRMES
00670      LD       A,10          ;DISPLAY MESSAGE
00680      RST      40
00690      RET
00700      ERRMES  DEFB      0AH
00710      DEFB      'Error - *CL driver not resident'
00720      DEFB      0DH
00730      SIGNON  DEFB      'Model 4 XON/XOFF flow control interrupt for *CL'
00740      DEFB      0AH
00750      DEFB      'By Thomas L. Quindry - January 9, 1986'
00760      DEFB      0DH
00770      ;
00780      ;INTERRUPT ROUTINE STARTS HERE
00790      ;
00800      DCB     DEFB      0000
00810      INT     PUSH     IY          ;SAVE FOR NEXT ROUTINE
00820      JR      NZ,RETURN      ;RETURN IF NO CHARACTER RECEIVED
00830      LD       A,C          ;XOFF ROUTINE
00840      CP       19          ;CHECK FOR XOFF
00850      JR      NZ,RETURN
00860      XON     LD       DE,(DCB)
00870      RELO2   EQU       $-2
00880      LD       A,3          ;GET BYTE FROM *CL
00890      RST      40
00900      JR      NZ,XON
00910      XON1   CP       17          ;CHECK FOR XON
00920      JR      NZ,XON
00930      RETURN  POP
00940      INTEND  RET
00950      LENGTH  EQU       $-DCB
00960      END       BEGIN

```

End

Moving?
Subscription Problems?

Get help with your subscription by calling our new toll free number:

1-800-227-5782

between 9 a.m. and 5 p.m. EST, Monday-Friday.

If possible, please have your mailing label in front of you as well as your cancelled check or credit card statement if you are having problems with payment.

If moving, please give both your old and new addresses.

Circle 168 on Reader Service card.

IT TAKES *THREE* TO TANGO

Telecommuter is an integrated word processing and communications program for your MS-DOS computer. You cannot find another product with our speed, power and unique features.

Telecommuter is as easy to learn and use as a Radio Shack Model 100. In fact, if you have a Model 100, you already know how to use Telecommuter's Word Processor and Telcom communications on your MS-DOS computer!

Fast File Transfer moves files between portable and desktop computers. Host Mode lets you control your MS-DOS computer from a remote site over telephone lines—exchange files, execute DOS commands, run application programs.

Telecommuter runs on the Tandy 1000/1200/2000/3000 and IBM-PC/XT/AT, with free telephone support for registered users.

Start a job on your portable, and quickly move the files to your desktop computer. Edit, print and transmit with big computer word processing and communications power—FAST!

Call today for more information or to order your copy!

TELECOMMUTER™

Software that always works
 Support that's always there
 Only \$200, MasterCard and VISA accepted

SO SIMPLE

SIGEA SYSTEMS, INC.

19 Pelham Road, Weston, MA 02193 (617) 647-1099

SIDEPORT

by John D. Wolfskill

is a pair of programs that allow the Model 4 and the Model 100 to function independently within the same application. Touch a key and Sideport stops your active application by opening a buffered video window on your Model 4. Your Model 4 becomes a terminal from which you can access and display Model 100 files. Your Model 100, in turn, can become a desktop organizer for the Model 4, complete with notepad and calculator functions.

Sideport can display a Model 100 RAM file exactly as it appears on the Model 100's liquid crystal display (LCD) screen (see the Photo). You can run and interact with Model 100 Basic programs from the Model 4. In addition, Sideport allows you to use its command line as a notepad for writing information directly to a Model 100 text file.

Getting Started

To use Sideport, carefully type in the Basic code in Program Listing 1 and save it to disk as Sideport/BAS. (Listings start on p. 100.) As the code is POKEd into RAM, lines 260-300 provide a checksum balance of each data line.

You may prefer to type in and assemble Program Listing 2. This code generates a command file that you invoke directly from TRSDOS Ready. Assemble this program as Sideport/CMD. The two listings are functionally identical.

You'll next need to build a job control language (JCL) file that will install the Sideport driver routines prior to each operating session. If you've used Listing 1, then create a JCL file using the TRSDOS Build command as shown in Fig. 1. If you've used Listing 2, build the JCL file as shown in Fig. 2.

These JCL files use the TRSDOS SETCOM command to configure the RS-232 port before installing Sideport. You should

make sure that each application disk that includes Sideport also includes the TRSDOS COM/DVR file. Once active, Sideport relies on its own communications routines.

Next, type the code shown in Program Listing 3 into your Model 100. Name it MSTRIO.BA and save it as a Basic program. This program provides the necessary file-handling and communication handshaking codes the computers need to converse.

Hardware Hookup

Attach a DB-25 serial cable to your Model 4's RS-232 port. Join a null modem adapter to the free end of this cable. If you have a DB-25 extender cable, attach it securely to the other end of the null modem, then to the serial port of the Model 100.

Before proceeding, double-check cable connections for tightness. Turn on the Model 100 (using your ac adapter); then load and run MSTRIO.BA. The Model 100's LCD will indicate that the MSTRIO.BA driver is active. You might want to issue the TRSDOS SETCOM command at this point and jot down the settings of your RS-232 port, as these will change under Sideport.

Make sure no SYSGENed routines or code modules are located in the address space where Sideport will reside (FC30-FFFF hexadecimal). Sideport protects itself from being overwritten by lowering the system HIGH\$ marker during initialization, forcing TRSDOS to load pointers and other housekeeping code modules elsewhere in memory.

Now install Sideport in your Model 4. At TRSDOS Ready, type in DO SIDEPT1/JCL:0 (or DO SIDEPT2/JCL:0 if you're using the /CMD version). If you use Sideport2/JCL to install Sideport, don't be concerned if you receive a "Job aborted" message. Sideport returns to TRSDOS Ready via an @EXIT supervisor call after initialization, causing the JCL processor to issue the message prematurely.

Shaking Hands

Make sure you have turned on your Model 100 and that MSTRIO.BA is active. Press control-O (the letter "O") on your Model 4 keyboard. A blank window surrounded by a graphics frame should open on your Model 4 display. You'll also hear a beep from each computer, which indicates they are communicating at the correct baud rate and that the data link is ready for operation. The window displays a command line with a blinking cursor in its lower-left corner. (You can close the window and resume your application program by pressing control-C.)

If the window begins to open and then abruptly closes, a firm handshake hasn't occurred. Press control-O again. Repeated failure of the window to remain open may indicate either a software or hardware error. Don't press control-O once the window has become active, or you'll lose the buffered portion of your application screen.

Also, never turn off the Model 100 or break from the Basic program while the Model 4 window is open. This may cause your Model 4 to hang up. If you want to make changes to the application aboard the Model 100, it's a good idea to close the Model 4 window beforehand.

Both machines must be operating at a 19,200-baud transmit/receive rate. You should be able to sustain reliable transmission at this rate if connections at both machines are solid. Depending on the condition of your cables and equipment, it may be necessary to decrease the transmission rate of both computers to maintain a workable linkup. Refer to your Model 100 owner's manual for the baud rate settings of COM files. The TRSDOS manual explains how to use the SETCOM command to change the Model 4's baud rate setting. If you lower the baud rate, make sure you do so equally on both machines.

Down to Business

You communicate with the Model 100 from Sideport's Model 4 command line; enter a command up to 39 characters long and press the enter key to begin transmission. Moving the cursor beyond the window on the right side will also begin transmission. If you make a typing mistake, clear the line and start over by pressing the left-arrow key.

Type in DIR and press the enter key. When the Model 4 window clears, Side-



System Requirements

Model 4 with 64K RAM

Model 100 with 8K RAM

Disk Basic or Editor/Assembler

Null modem adapter

RS-232 cable

```
BUILD SIDEPT1/JCL:0
MEMORY (HIGH = X'FC2F')
SET *CL TO COM/DVR
SETCOM (BAUD = 19200,WORD = 7,CTS = ON)
BASIC
LOAD "SIDEPORT/BAS:0".R
//EXIT
```

Figure 1. If you enter the Basic program code, use the Build command to create this JCL file.

```
BUILD SIDEPT2/JCL:0
MEMORY (HIGH = X'FC2F')
SET *CL TO COM/DVR
SETCOM (BAUD = 19200,WORD = 7,CTS = ON)
SIDEPORT/CMD:0
```

Figure 2. If you use an editor/assembler, use the Build command to create this JCL file.

Line(s)	Description
20-30	File initialization area
40-50	Opens COM: file buffers 1 and 2 for input/output
60	Provides jump to error handler
70	Provides handshake sequence to Model 4 video driver
80	Scans Model 100 RS-232 port for incoming characters
90	Establishes initial data link with Model 4
100	Places input characters into B\$ until a carriage return terminates the input
110-160	Response string argument area
170	Clears line buffer and returns for new input
180-220	Transmits Model 100 Text/RAM files
230-240	Byte input/output handshaking loop
250	Transmits copy of LCD screen to Model 4 window
300	Error-handler routine

Table. MSTRIO.BA program operation summary.

port displays a list of files in the Model 100 directory. Choose from the available text files (those with the .DO extension) by entering a file name on the command line. The file should immediately begin to transmit into the Model 4 window. If it does not, you've probably issued a command that MSTRIO.BA doesn't recognize. You can correct the problem easily by changing or adding a proper response string in the MSTRIO.BA argument section (lines 80-170).

You can halt transmission at any point by pressing shift/@. Strike any key and the file will continue transmitting where it left off. Keep in mind that after a file has begun transmitting, it must be allowed to continue until reaching the end-of-file (EOF) marker. You can't back up or rewind the file. The Model 4 video driver automatically handles line feeds and carriage returns in the Model 100 text file.

MSTRIO.BA transmits an ASCII CHR\$(127) to the Model 4 to signal the end of each file or transmission sequence. This

tells the Sideport video driver to switch the Model 4 from receiving Model 100 characters to scanning the command line for input.

After the Model 100 transmits a data byte, lines 230-240 remain in a holding loop until the Model 4 transmits an ASCII CHR\$(17) to confirm receipt of the byte. After sending a byte, the Model 4 remains in a similar pattern until it receives an acknowledging CHR\$(19) from the Model 100. This process allows the computers to talk to each other without losing data. They send bytes one at a time and await confirmation of each byte before issuing the next.

Basic Control

With Sideport, you can execute Model 100 Basic programs (those with the .BA extension) directly from the Model 4 keyboard. Use MSTRIO.BA to address each program and load it into the Model 100 program buffer. Also, you must code the Basic program to receive and process in-

put requests from the Model 4 via the Sideport driver. The Basic program must handle data handshaking in the same manner as MSTRIO.BA does when processing text files.

To better understand how Sideport handles input/output (I/O) with a Model 100 Basic program, you may want to type in Program Listing 4. The code is an example of the I/O process; it isn't meant to be a fully functional calculator program. However, the calculator is smart enough to add, subtract, multiply, and divide integers. Name the program CALC.BA and save it as a Basic program in your Model 100.

At the Sideport command line, type in CALC.BA and press the enter key. The I/O process begins when line 160 of MSTRIO.BA executes, autostarting CALC.BA. (See the Table for a summary of MSTRIO.BA's operation.) After the LCD and Model 4 window clear, CALC.BA's opening prompt will appear.

Request a calculation by typing a formula on the command line. Terminate the input with a carriage return. If, for example, you type in:

12000*15 = ICR-

CALC.BA responds with:

12000*15 = 180000

Lines 60-110 capture input from Sideport's command line and save it in string variable CA\$. Lines 120-180 determine the operator type (+ - * /) and separate the multiplicand from the multiplier. Lines 190-220 calculate values and produce a product. Line 230 provides a call to the subroutine that updates the Model 4 video display.

Program control is then returned to line 60 for another request to enter formulas. At this point, you may exit the program by pressing the @ key. Line 80 loads and restarts MSTRIO.BA.

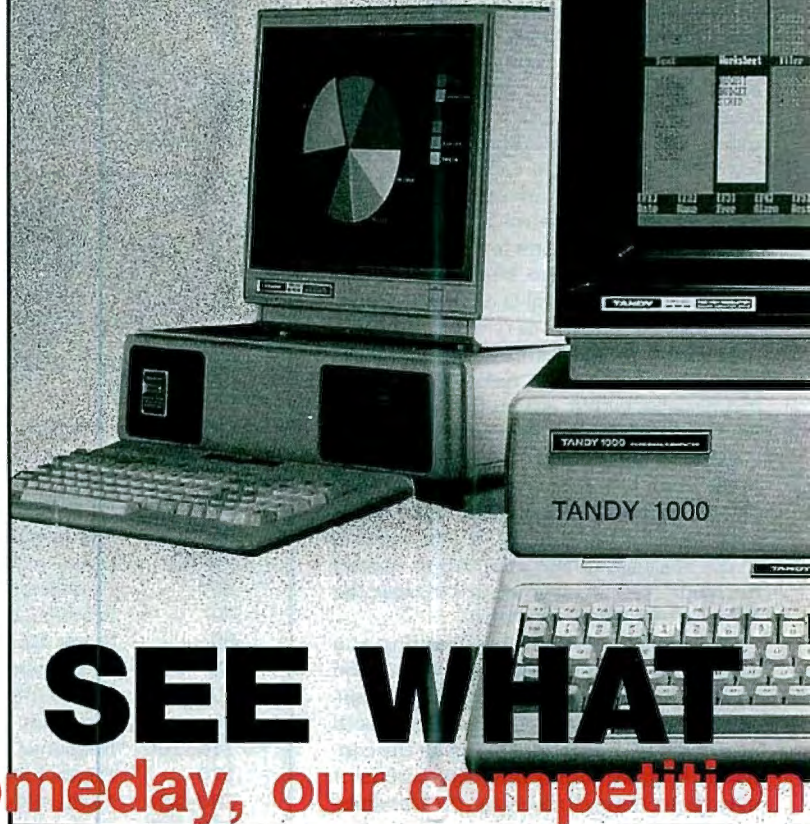
Before returning to your Model 4 application (by pressing control-C), try the notepad function. Type in OPEN PAD on the command line. The Model 100 responds with the message, "Notepad open." MSTRIO.BA opens the file NPAD.DO in line 130 in order to accept



Photo. With Sideport, you can use the Model 4 to access and display Model 100 files.

TANDY™

TANDY 2000



SEE WHAT Someday, our competition

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.

* For a small restocking fee.

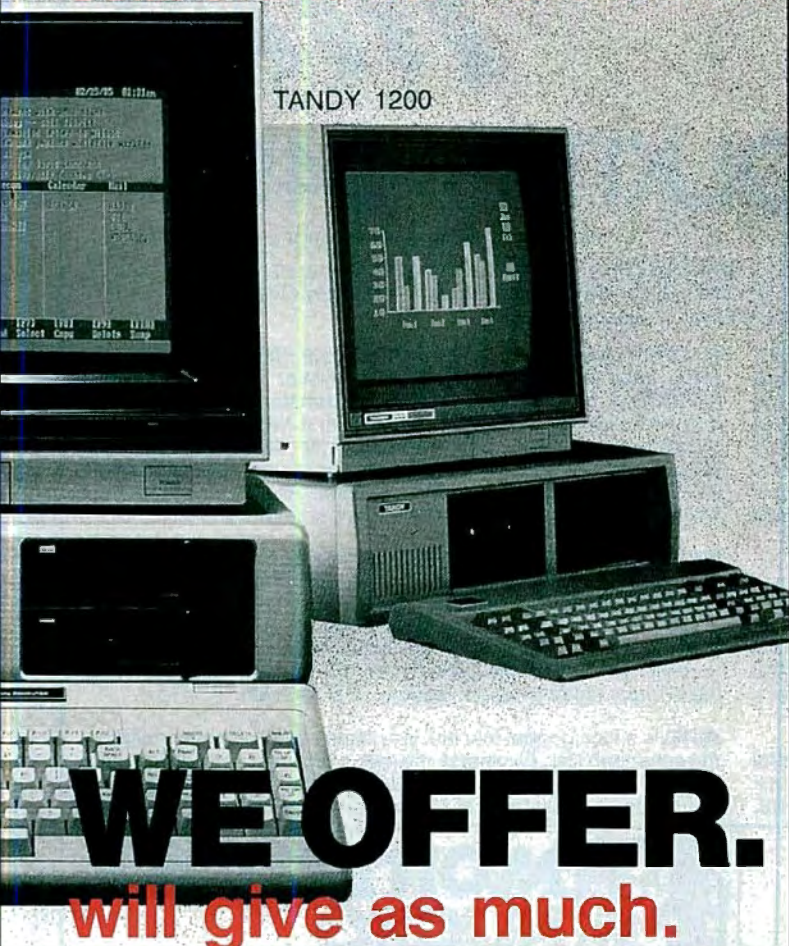
CUSTOMER SERVICE/QUESTIONS ABOUT
YOUR ORDER and in TEXAS 1-817-573-4111
(9 am-5 pm TEXAS TIME MONDAY-FRIDAY)

Fort Worth Computers
377 Plaza
Granbury, Texas 76048



CALLFREE NUMBER:

COMPUTERS and PRINTERS etc.



WE OFFER.
will give as much.

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.



Circle 214 on Reader Service card.

FORT WORTH COMPUTERS

(WE ARE SERIOUS ABOUT SAVING YOU MONEY)

Located 30 miles from Ft. Worth

For
Latest
Prices

(1-800-) **433-S-A-V-E**

updates to the notepad. Write anything you like by typing from the command line. End each line with a carriage return. When you're through with the notepad, type in CLOSE PAD to close the file.

Helpful Hints

You don't have to open and close COM file buffers 1 and 2 each time you use MSTRIO.BA to load a Basic program. Model 100 COM files are functionally classified as transmission files. Unlike sequential data files, they aren't prone to data loss when accidentally left open.

Avoiding use of the Clear statement at the beginning of the Basic programs started by MSTRIO.BA is a good idea. If you must clear string space, add the equivalent of MSTRIO.BA lines 40 and 50 to your application. This reopens the COM files the Model 100 automatically closes when the Clear statement is issued.

MSTRIO.BA handles Model 100 LCD video transfers to the Model 4 differently when in control of a Basic program. The subroutine starting at line 250 PEEKs into Model 100 video RAM and transmits a copy of the LCD to the Model 4 window. Keep in mind that you must provide this routine in each of your Basic programs and call it as needed to issue new LCD information for the Model 4 window.

You can code the program to update the LCD first, perhaps writing several lines to its own display before finally updating the Model 4 window. You must also provide a way of restarting MSTRIO.BA when your Basic program finishes. Line 80 of Listing 4 shows one way of returning to MSTRIO.BA.

Applications

Of the applications in my somewhat limited Model 4 disk library, Sideport is compatible with Scripsit, VisiCalc, EDAS, Multiplan, PROduce, DeskMate, and Profile 4.

Sideport depends for its operation on the TRSDOS keyboard driver; applications must actively scan this keyboard driver to recognize the utility. Generally, Sideport will work with applications that do not alter the Model 4 keyboard driver. Since SuperScripsit doesn't fully honor the TRSDOS keyboard driver, Sideport won't work with SuperScripsit. Model 4 Disk Basic programs will work with Sideport when they are scanning the keyboard.

Conservatively, I'd estimate there are a hundred Basic programs that could be written for our new Model 104. If you find an interesting application, don't keep it a secret. ■

John D. Wolfskill, an engineering instructor at the Naval Education and Training Center in Newport, RI, has been a TRS-80 hobbyist since the early Model I days. You can write to him at 201 Puritan Drive, Middletown, RI 02840.

Listings start on p. 100.



MONTEZUMA MICRO

PRESENTS

MONTE'S TOOLKIT

\$49

WOW!
ANOTHER
NEW
PRODUCT
FROM
MONTE

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 menu 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 line-feeds 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.



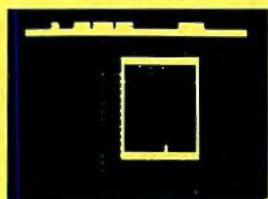
MONTEZUMA MICRO

PRESENTS

MONTE'S WINDOW™



NOTEPAD



CALENDAR

WINDOWS ON YOUR MODEL 4!

TAKES NO USER RAM!



CALCULATOR

Pop Up Menus!

\$49

Easy to Use!



INDEX CARD FILE

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

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.

CP/M...The Software Key That Unlocks Your Model 4

CP/M is the standard 8-bit Z-80 operating system and many thousands of programs have been written to run under this system. With Montezuma Micro's CP/M you can run these programs on your Model 4/4P. Think about all those nationally known programs you've wanted to use. Programs like WordStar; dBASE II; SuperCalc; MultiPlan etc. With our version of CP/M 2.2 all those public domain programs on bulletin boards across the USA are available for free downloading. CP/M is the missing link that joins all this software to your Model 4/4P. Montezuma Micro's CP/M comes ready to use and requires no hardware modifications. This product has been awarded the best and highest ratings in the reviews and we are continuously improving it with you in mind. With our CP/M you get more than just a DOS. You get the other half of your Model 4/4P.

AVAILABLE NOW FOR IMMEDIATE SHIPMENT - Less Hard Disk Drive Support..... \$169
Optional Hard Disk Drive Support \$ 30

(Radio Shack 5M, 12M, 15M, 35M • Aerocomp/Percom 5M, 10M, 15M, 30M • Bi-Tech 5M, 10M, 11M, 15M, 20M, 30M, 40M)

FEATURES

- Full range of floppy drive support. Dual-head and/or 80 tracks.
- Optional hard disk support allows positioning and selective assignment of logical drives. Easy backup routine.
- Memory drive allows the use of the other 64K RAM bank on 128K machines.
- Modem 7, a powerful public domain communications program furnished at no charge, allows for file transfer and remote database access such as CompuServ and The Source.
- CONFIG is our flexible utility that allows complete control of all operating parameters from menus. Format, read and write more than 30 different manufacturer's disk formats with more being added rapidly.
- Disk Utility Program allows fast format, backups and verifying of ours and other manufacturer's disks.
- These CP/M utilities are included: ASM; DDT; DUMP; ED; LOAD; MOVECPM; PIP; STAT; SUBMIT; SYSGEN; and XSUB.

WHY BUY OURS?

	MONTEZUMA MICRO	RADIO SHACK
Transient Program Area (TPA)	55K	52K
Bytes free in MBASIC	30,776	18,488
Bytes free of formatted disk	196K	160K
64K Memory drive	YES	NO
Double-Side/80tk drive support	YES	NO
Format, read/write other		
CP/M formats	YES	NO
Communication program included	YES	NO
Share HD with TRSDOS/LDOS	YES	NO
Assign multiple drives to HD	YES	NO
Boots from Hard Disk (4P)	YES	NO
Popular terminal emulation	YES	NO
User defined function keys	9	3
Timely product support	YES	NO

128K MEMORY UPGRADE

Our upgrade kit includes 64K RAM, a genuine PAL chip and instructions for installation. This kit will upgrade your 64K Model 4 to 128K and allow the use of our MEMLINK program and the TRSDOS 6.x MEMDISK. Guaranteed 1 year.

A BARGAIN AT ONLY \$74 Model 4
\$64 Model 4P - No PAL

This popular software is available for the Model 4/4P using our CP/M.

- WordStar** Fast memory-mapped version 3.3 \$250
- MailMerge** Multi-purpose file merging program ... 125
- SpellStar** 20,000 word proof-reader on a stick ... 125
- StarIndex** Creates indices and Tables of Content... 85
- DataStar** Data entry and retrieval is yours 175
- ReportStar** Report generator and file manipulator.... 150
- InfoStar** The above two programs 300
- dBASE II** with Disk Tutorial..... 385
- CBASIC** version 2.8..... 85
- TURBO PASCAL** by Borland. This is the one..... 45

ORDER INFORMATION

Call now and your order will be shipped immediately. We accept American Express, MasterCard and Visa plus we ship COD (cash or cashier's check only). Credit cards are not charged until your order is shipped. Add \$4 shipping per item on orders within the 48 states. Suitability of the software is the responsibility of the purchaser as there are **NO REFUNDS**. Defective items will be replaced upon their return, postpaid.

ORDER NOW ... TOLL FREE

800-527-0347
800-442-1310

The Toll Free lines are for orders only.
 Specifications subject to change without notice.

CP/M is a Trademark of Digital Research, Inc.; Interchange and Memlink are Trademarks of Montezuma Micro; TRS-80 is a Trademark of the Tandy Corporation; WordStar, MailMerge, SpellStar, StarIndex, InfoStar, ReportStar, DataStar, SuperSort and CalcStar are Trademarks of MicroPro International Corporation. Multiplan is a Trademark of Microsoft.

Copyright Montezuma Micro 1984.



MONTEZUMA MICRO

214-339-5104
 Redbird Airport, Hangar #18
 P.O. Box 32027
 Dallas, Tx 75232

"WE KEEP YOU RUNNING"



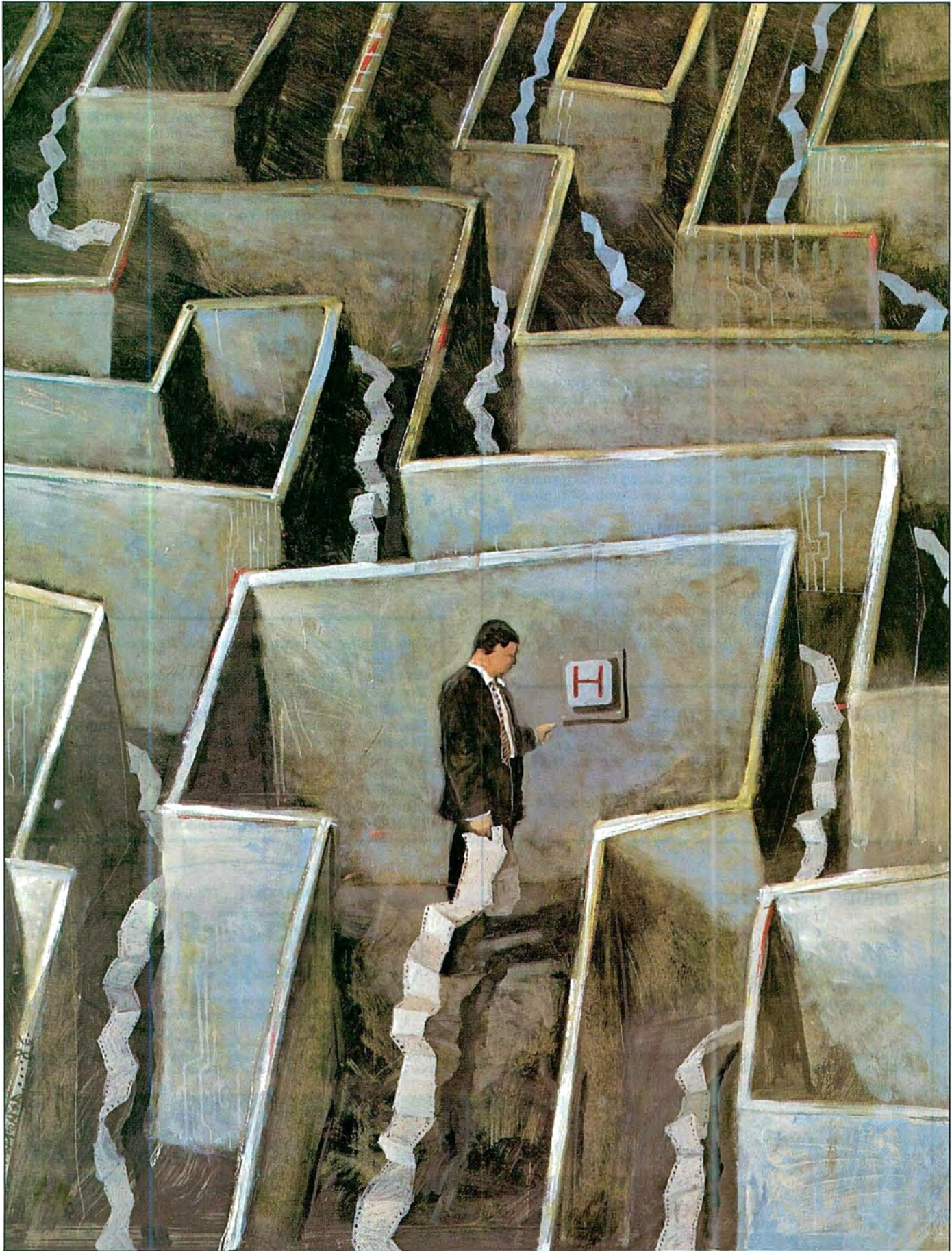


Illustration by Michael Paraskevas

HELP YOURSELF

by Daniel Zenzel Jr.

One of TRSDOS 6.2's best features is its Help utility. When you run into trouble or forget a command, you can call up screens of information from DOS Ready. TRSDOS comes with a file of information about DOS commands, but, to make Help really useful, you need to add your own files. Unfortunately, the manual doesn't tell you exactly how. HelpMate (see the Program Listing) does the job for you. It's a complete help file utility that lets you create, edit, and delete files; compress files to save disk space; and print out a help manual. You can also use it to edit the DOS file Tandy supplies.

Your Options

After you've typed in the Listing from Basic and saved it, and before you run the program, I recommend installing Memdisk as drive 2 for temporary file storage. The TRSDOS manual explains how. This significantly speeds up the program's execution. If you don't want to use Memdisk, change the program to indicate on which drive you'll be storing the temporary files (see lines 300, 480, 1400, 1440, 1720, and 1830).

When you run HelpMate, it prompts you for the name of the help file with which you want to work. You can call up an old file or name a new one; all file names must end with the extension /HLP.

Each file contains one or more topics, which are comparable to records in a data base. You could store a short file under a single topic heading, but dividing longer files into several topics makes editing easier and information easier to find.

When the menu appears (see the Figure), select option 1 to add topics to your file. You're prompted for a topic name, and the program checks to see if that name is already in use. If not, you're ready to enter the new text. The program formats your text as a numbered list, but each entry can be as long or short as you want. Don't press the enter key until you've completed an item; otherwise use the arrow keys to move to the next line.

You can turn inverse video on and off with the backslash character (press clear and the slash key together). Once you're

through entering text, type @ on a new line and press the enter key. This writes the text to the help file and updates the program's topic list.

Option 2 lets you delete topics you no longer need. With option 3, you can insert, delete, replace, or edit any lines in a topic. Option 4 compresses a file's text, usually by 10-40 percent. Once the text is compressed, the file's original and new lengths will appear on the screen.

If you need a printout of a file, choose option 5. Printouts are in manual form, with a title page and an index. (For information about printer compatibility, see the Program Mechanics section below.) Option 6 lets you exit to Basic.

When you need to consult your help file, type in HELP from TRSDOS Ready. The Help utility prompts you to select a file, and a topic within the file, to read.

Background Briefing

For those of you who might want to modify HelpMate, I'll explain some of its workings. But first, you should understand the file format that the TRSDOS Help utility (Help/CMD) expects.

A help file has a logical record length of 1. The utility handles the file as a stream of bytes, using relative byte positioning to obtain data from the file.

Then, the help file is partitioned into three sections: the text of all topics, a set of topic names and pointers to text, and a pointer at the end of each file that points to the second section (the topic list).

The help file's pointers are relative to

byte zero of the file and are stored in least significant byte/most significant byte format. Note that Basic references a file relative to byte 1, so Basic programs that use these help file pointers must make an adjustment. (In other words, the pointer to byte zero in the file is actually byte 1 in Basic.) Also, since the pointers in the help file are only 2 bytes long, the maximum size of a help file is 64K.

The help file's second section, the topic list, has a special format. All topics in the list must be stored alphabetically in uppercase, and the high bit of the last character in the topic name must be set. Topic names must be at least two characters long. The pointer that accompanies each topic name is set to point to the beginning of the text for that topic.

The file's text section contains the information to be displayed. Each segment of text is terminated by a byte containing 0C hexadecimal (hex), which indicates to Help that the current topic has no more text. The text is stored in a compressed form in the DOS/HLP file. To compress text, Help sets the high bit of any character followed by a space and omits the space in the file.

Program Mechanics

Now for a brief look at HelpMate's operation. When you run the program, it opens a help file and saves a copy of the topic list (the second section of the file) in two arrays. Each time you add a topic, HelpMate writes it to the file and adds its name and a text pointer to the topic list arrays. When you quit the program, it writes the updated topic list back to the file.

If you delete a topic, HelpMate removes it from the topic list, moves up the topics that follow it to overlay its space, and adjusts topic pointers accordingly. To speed up this process, HelpMate creates a temporary file for any text that follows the topic being deleted, and then copies the text to the proper place. This avoids unnecessary disk drive head movement caused by single-byte reads and writes on the same file in different positions.

When you update a topic, HelpMate copies the original text into a string array



System Requirements

Model 4
64K RAM
TRSDOS 6.2
Memdisk optional
Disk Basic
Printer optional

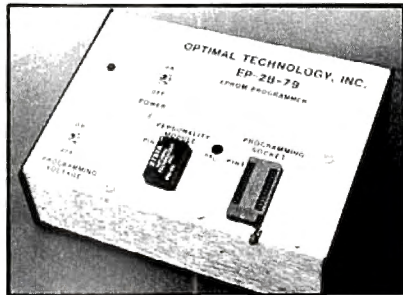
Let MS-DOS batch files do those routine jobs automatically.

Hey!

Remember to mention that you saw their ad in 80 Micro

Thanks. . . .

Circle 201 on Reader Service card.



EPROM PROGRAMMER For TRS-80 MODELS I, III, 4 or MS-DOS SYSTEMS

Programs, verifies, reads, checks if erased, disk I/O, and edit, 2708 thru 27513 options, depending on particular system.

MODEL EP-2B-79 EPROM PROGRAMMER, TR-24

parallel interface, disk software (specify TRSDOS, CP/M or MS-DOS, and personality module PM-5 for programming 2716, 2758 EPROMs, \$245.00

OPTIMAL TECHNOLOGY
Earlsville, VA
804-973-5482

- 1) Add a topic
- 2) Delete a topic
- 3) Update a topic
- 4) Compress Help Text
- 5) Print a Help Manual from file
- 6) End

Figure. HelpMate's main menu.

and deletes it from the file. After you edit the material in the string array, the program writes the text back to the help file and returns the topic to the topic list.

To compress text, the program copies it to a temporary file. As it compresses each topic's text, it updates the topic list. Upon completing the compression, it copies the

temporary file back over as the help file and tells you how much space you've saved.

I wrote HelpMate to print manuals on the DMP-100: you may need to change the variables UL.CHARON\$ and UL.CHAROFF\$ to make the program compatible with your printer. Also, any text written in inverse video will be underlined in the manual.

Etc.

Be aware that HelpMate is slow when handling large files.

I've included comments in the program code to make modifications as easy as possible. ■

Daniel Zenzel Jr. welcomes your comments. You can write to him at P.O. Box 368, Perkasie, PA 18944.

Program Listing. HelpMate. Lines 300, 480, 1400, 1440, 1720, and 1830 must be modified if you are not using Memdisk as drive 2.

```
10 '-----
20 ' HPU/BAS                      HelpMate                      Version 1.0
30 '                               By Daniel Zenzel, Jr.          September 1985
40 '
50 ' This program provides a simple means by which the TRSDOS 6.2 Help file
60 ' may be modified, or by which a user may create new, custom, help files.
70 '
80 '-----
90 DIM TXT.BUFF$(100),TOPIC.NAMES(100), TOPIC.LOC$(100), TOPIC.PAGE$(100)
100 UL.ON = 0: UL.CHARON$ = CHR$(15): UL.CHAROFF$ = CHR$(14): LINES.PAGE = 66
110 CLS:PRINT:PRINT "HelpMate, Version 1.0"," ", "By Dan Zenzel, Jr."
120 PRINT:PRINT:PRINT:INPUT "Enter Name of Help File to work on ";HELP.FILES
130 GOSUB 840: ' Initialize topic arrays, etc.
140 IF INIT.RESULT <> 0 THEN GOTO 120
150 MENU.RSP = 0
160 WHILE (MENU.RSP <> 6)
170   GOSUB 678: ' display menu
180   ON MENU.RSP GOSUB 1880, 1490, 2280, 300, 3660
190 WEND
200 GOSUB 1180: ' Finish up, and close file
210 CLS: PRINT:PRINT:PRINT "HelpMate - Finished"
220 END
230 '-----
240 ' This routine will COMPRESS the TEXT portion of a help file, eliminating
250 ' spaces, taking advantage of the Help/cmd ability to translate any
260 ' character with the high bit set into the character followed by a space.
270 ' Note that this takes a while, as a temporary file is created, and a full
280 ' text copy is performed.
290 '-----
300 OPEN "r",2,"hlptmp/tmp:2",1: FIELD 2, 1 AS HT$
310 PRINT "Compressing ";HELP.FILES;"...."
320 CTR = 1: TPOS = 1: SAV.END = TEXT.END: LAST.CHAR$ = " "
330 WHILE (CTR <= TOPIC.COUNT): ' For each topic...
340   TEMP$=" ": FPOS = TOPIC.LOC$(CTR): TOPIC.LOC$(CTR) = TPOS
350   WHILE (ASC(TEMP$)<12): ' Copy and compress it
360     GET 1,FPOS: FPOS = FPOS + 1: TEMP$ = H$
370     IF ((ASC(LAST.CHAR$) AND 128)<>0) AND (TEMP$=" ") THEN LSET HT$=H$:
380     PUT 2,TPOS:TPOS=TPOS+1:LAST.CHAR$=H$:GOTO 390
390     IF (FPOS>2 AND TEMP$=" " AND((LAST.CHAR$="A" AND LAST.CHAR$<="Z")OR(LA
400     ST.CHAR$="a" AND LAST.CHAR$<="z"))) THEN GET 2,(TPOS-1):LSET HT$=CHR$(ASC(HT$)O
410     R 128):PUT 2,(TPOS-1):LAST.CHAR$=H$ ELSE LSET HT$=H$:PUT 2,TPOS:TPOS=TPOS+1:LAST
420     .CHAR$=H$
430   WEND
440   CTR = CTR + 1
450 WEND
460 TEXT.END = TPOS-1
470 TOPIC.PTR = TPOS
480 FOR I = 1 TO TEXT.END: ' Copy the compressed data over to the help file
490   GET 2,I: LSET H$=HT$: PUT 1,I
500 NEXT I
510 CLOSE 2
520 KILL "hlptmp/tmp:2"
530 PRINT "Compression Complete. Original Text = ";SAV.END,"Final text = ";
540   TEXT.END: FOR I = 1 TO 3000:NEXT I
550 RETURN
560 '-----
570 ' This routine displays a header, Help File Name, and a list of the
580 ' current topics on the screen, followed by a bar.
590 '-----
600 CLS:PRINT:PRINT "HelpMate, Version 1.0"," ", "By Dan Zenzel, Jr."
610 PRINT STRING$(80,95):PRINT
620 PRINT "Current Help File : ";HELP.FILES
630 PRINT "Current Topics : "
640 FOR I = 1 TO TOPIC.COUNT
650   PRINT TOPIC.NAMES(I), " ";
660 NEXT I
670 PRINT:PRINT STRING$(80,95)
```

Listing continued

Powerful Programming Tools At Bargain Prices

C compiler

for the model 1 or 3 using TRSDOS, LDOS, NEWDOS, DOSPLUS, or MULTIDOS; includes full screen text editor and advanced development package

List Price ~~\$250.00~~
Sale Price \$89.95

Multi-Basic compiler

for the model 1 or 3, or 4 using TRSDOS, LDOS, NEWDOS, DOSPLUS, or MULTIDOS; includes full screen text editor and advanced development package

List Price ~~\$250.00~~
Sale Price \$89.95

This is a full K & R standard implementation of C that includes a Unix compatible function library. The package also includes a 450 page manual with a tutorial on using the C language. If you've been wanting to learn C, this is the package you need.

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

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.

Special Bonus

Buy one version for \$89.95 and get the version for the other model for only \$21.

Multi-Basic is a TRS-80 BASIC compatible compiler. The Model 4 version supports everything in the TRSDOS 6 BASIC interpreter except the COMMON statement. The same support is provided in the Model 1 and 3 versions so programs are portable. The CMD statement is the only statement from the Model 1 and 3 BASIC interpreters that is not supported.

Multi-Basic also supports advanced language features like multi-line procedures and functions, recursion, and dynamic string management (no long pauses for garbage collection).

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.

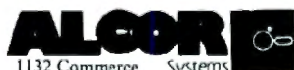
Special Bonus

Buy one version for \$89.95 and get versions for the other two models for only \$21 each.

Sale Price Extended Through October 31

C Compiler

Circle version(s) Model
 One version (\$89.95) 1 3
 Both versions (\$110.95) _____
 Add 6% sales tax (Texas only) _____
 Shipping \$6 USA/\$28 foreign) _____
 Total _____



1132 Commerce Systems
 Richardson, TX 75081
 (214) 238-8554

Circle 215 on Reader Service card.

Name _____
 Street _____
 City _____
 State _____
 Zip _____
 Country _____
 Phone _____

Also available for CP/M & MSDOS
 \$89.95 each

MC Visa Money Order Check COD
 Card # _____ exp _____

Multi-Basic Compiler

Circle version(s) Model
 One version (\$89.95) 1 3 4
 Two versions (\$110.95) _____
 Three versions (\$131.95) _____
 Add 6% sales tax (Texas only) _____
 Shipping \$6 USA/\$28 foreign) _____
 Total _____

Multi-Basic is a trademark of Alcor Systems
 TRS-80 is a registered trademark of Tandy Corp.
 MSDOS is a trademark of MicroSoft
 CP/M is a trademark of Digital Research
 Unix is a trademark of Bell Laboratories
 LC is a trademark of MisoSys



Whereis

\$29.95

Locate that program on the Hard Disk that you forgot the name and directory of.

Spiffy Program — 49.95

Printout graphics, text, etc. on a label designed with PC Paint. B/W printer.

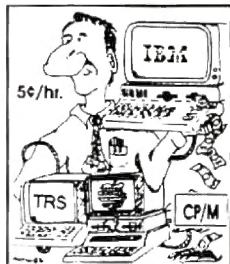
NoColor — 19.95

All characters & background made clear on monochrome screen. Works for games or business applications.

Orthogonal — 9.95

Thinker person's game of strategy based upon orthogonal movements.

Programs written for IBM/PC/XT/AT & Compatibles.



FILE TRANSFER + CONVERSION Utilities 149.95

Apple }
TRS } to IBM PC/XT or AT version 224.95
CP/M } compatibles

IBM PC ↔ Tandy 2000 Disk Transporter 149.95

Ask for Transfer Service:
**Macintosh to IBM PC
Pfs to Pfs (move in & out)**



— 88¢ DS DD 50 qty.

MC/VISA/COD/CHECK OK

408/988-0164

**PERSONAL
COMPUTER
PRODUCTS**

3080 Olcott Dr. Ste. B130
Santa Clara, California 95051

IBM is a register trademark of International Business Machines
Macintosh is a register trademark of Apple
Pfs is a register trademark of Software Publishing

Listing continued

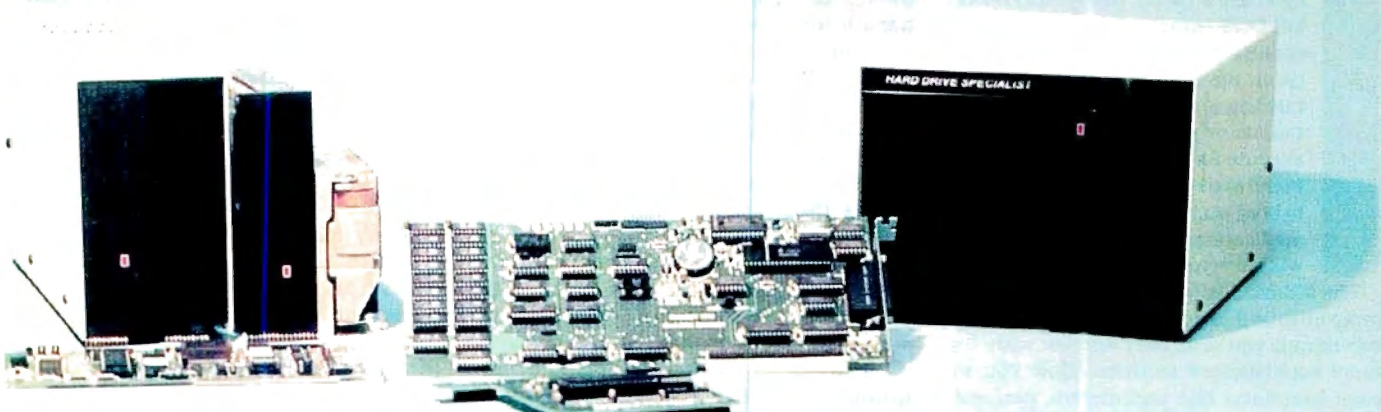
```

630 RETURN
640 '-----
650 ' This routine displays the menu and returns the response menu.resp.
660 '-----
670 GOSUB 550
680 PRINT:PRINT"HelpMate Menu : "
690 PRINT TAB(15);"1) Add a topic"
700 PRINT TAB(15);"2) Delete a topic"
710 PRINT TAB(15);"3) Update a topic"
720 PRINT TAB(15);"4) Compress Help Text"
730 PRINT TAB(15);"5) Print a Help Manual from file"
740 PRINT TAB(15);"6) End "
750 PRINT:PRINT:INPUT" Please make your selection (1-6) ";ANS$
760 IF VAL(ANS$)<1 OR VAL(ANS$)>6 THEN PRINT"Invalid choice":FOR I=1 TO 3000:NEX
T I: GOTO 670
770 MENU.RSF = VAL(ANS$)
780 RETURN
790 '-----
800 ' This routine performs initialization for the help file utility. The
810 ' requested help file is opened, the topic list is stored in work arrays
820 ' and the txt.buff is initialized.
830 '-----
840 OPEN "r",1,HELP.FILES,1: INIT.RESULT = 0
850 FIELD 1, 1 AS H$
860 IF LOP(1)>0 THEN 930: ' The file is ok, so continue
870 INPUT"The requested help file does not exist, Create it (y/n) ";TEMP$
880 IF LEFT$(TEMP$,1)="N" OR LEFT$(TEMP$,1)="n" THEN CLOSE 1: KILL HELP.FILES:
INIT.RESULT = 1: RETURN
890 ' ok, must create a new help file
900 LSET H$=CHR$(0): PUT 1,1: ' Make topic ptr equal to lof-1 (no topics!)
910 LSET H$=CHR$(0): PUT 1,2
920 ' it is ok to continue
930 TOPIC.COUNT = 0: TOPIC.PTR = 0: TXT.COUNT = 0: TEXT.END = 0
940 HOLD.LOF = LOF(1)
950 GET 1,LOF(1): TEMP$ = H$:
GET 1,(LOF(1)-1): TOPIC.PTR = ASC(TEMP$)*256+ASC(H$)+1
960 ' Now, Load the topic list into the topic arrays
970 FPOS = TOPIC.PTR: TEXT.END = TOPIC.PTR - 1
980 WHILE (FPOS < (LOF(1)-1))
990 TOPIC.COUNT = TOPIC.COUNT + 1
1000 TOPIC.NAME$(TOPIC.COUNT) = " "
1010 WHILE ( (ASC(RIGHT$(TOPIC.NAME$(TOPIC.COUNT),1)) AND 128) = 0)
1020 IF TOPIC.NAME$(TOPIC.COUNT) = " " THEN TOPIC.NAME$(TOPIC.COUNT)=" "
1030 GET 1,FPOS: FPOS = FPOS + 1
1040 TOPIC.NAME$(TOPIC.COUNT) = TOPIC.NAME$(TOPIC.COUNT) + H$
1050 WEND
1060 MIDS(TOPIC.NAME$(TOPIC.COUNT),LEN(TOPIC.NAME$(TOPIC.COUNT)),1) =
CHR$(ASC(H$)-128)
1070 GET 1,FPOS: FPOS = FPOS + 1: TEMP$ = H$: ' Now the pointer
1080 GET 1,FPOS: FPOS = FPOS + 1:
1090 TOPIC.LOC$(TOPIC.COUNT) = ASC(H$)*256 + ASC(TEMP$)+1
1100 WEND
1110 RETURN
1120 '-----
1130 ' This routine finishes up the Help File Utility, by writing the
1140 ' possibly updated topic list back to the help file and updating
1150 ' the topic list pointer at the end. The file is then closed before
1160 ' returning.
1170 '-----
1180 FPOS = TEXT.END + 1: CTR = 1: TOPIC.PTR = FPOS
1190 PRINT "Terminating HelpMate...."
1200 WHILE (CTR <= TOPIC.COUNT)
1210 TEMP$ = RIGHT$(TOPIC.NAME$(CTR),1)
1220 TEMP$ = CHR$(ASC(TEMP$) OR 128): ' set high bit of last character
1230 MIDS(TOPIC.NAME$(CTR),LEN(TOPIC.NAME$(CTR)),1) = TEMP$
1240 FOR I = 1 TO LEN(TOPIC.NAME$(CTR)): ' Put to file
1250 LSET H$ = MIDS(TOPIC.NAME$(CTR),I,1)
1260 PUT 1,FPOS: FPOS = FPOS + 1
1270 NEXT I
1280 LSET H$ = CHR$( (TOPIC.LOC$(CTR)-1) - (INT((TOPIC.LOC$(CTR)-1)/256)*256) )
1290 PUT 1,FPOS: FPOS = FPOS + 1
1300 LSET H$ = CHR$(INT((TOPIC.LOC$(CTR)-1)/256))
1310 PUT 1,FPOS: FPOS = FPOS + 1
1320 CTR = CTR + 1
1330 WEND
1340 LSET H$ = CHR$( (TOPIC.PTR-1) - (INT((TOPIC.PTR-1)/256)*256) )
1350 PUT 1,FPOS: FPOS = FPOS + 1
1360 LSET H$ = CHR$(INT((TOPIC.PTR-1)/256))
1370 PUT 1,FPOS
1380 IF (FPOS >= HOLD.LOF) THEN CLOSE 1: RETURN
1390 PRINT"Termination will be a little longer, Restructuring the File Size.."
1400 OPEN "r",2,"temp/hlp:2",1:FIELD 2,1 AS HT$
1410 FOR I = 1 TO FPOS: GET 1,I:LSET HT$=H$:PUT 2,I:NEXT I
1420 CLOSE 1: KILL HELP.FILES: OPEN "r",1,HELP.FILES,1:FIELD 1,1 AS H$
1430 FOR I = 1 TO FPOS: GET 2,I: LSET H$=HT$: PUT 1,I: NEXT I: CLOSE 1
1440 CLOSE 2: KILL "temp/hlp:2"
1450 RETURN
1460 '-----
1470 ' This routine handles the deletion of a help file topic.
1480 '-----
1490 INPUT"what is the name of the topic you wish to delete ";TEMP$
1500 FOR I = 1 TO LEN(TEMP$): ' Convert to upper case
1510 IF ((MIDS(TEMP$,I,1)>="a") AND (MIDS(TEMP$,I,1)<="z")) THEN
MIDS(TEMP$,I,1) = CHR$(ASC(MIDS(TEMP$,I,1))-32)
1520 NEXT I
1530 FOUND = 0: CTR = 1
1540 WHILE ( (FOUND = 0) AND (CTR <= TOPIC.COUNT))
1550 IF TOPIC.NAME$(CTR) = TEMP$ THEN FOUND = 1 ELSE CTR = CTR + 1
1560 WEND
1570 IF CTR > TOPIC.COUNT THEN PRINT"The requested topic Not in current file":
FOR I=1 TO 3000:NEXT I: RETURN
1580 PRINT "Deleting the Requested Topic.... Note: This may take a while."
1590 DEL.TOPIC$ = TOPIC.LOC$(CTR): ' First adjust the arrays
1600 FOR I = CTR TO (TOPIC.COUNT-1)

```

Listing continued on p. 106

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.

8087 Board for the Tandy 1000 \$249.

8087 Upgrade for the Tandy 1000A \$119.

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.

Features Include:

- All sizes rated after formatting.
- One Secondary may be added.
- Error checking and correcting controller.
- Software drivers included.
- Built in power up diagnostics.
- Gold connectors used throughout.
- 1 year warranty.
- Boots directly from Hard Drive.
- Uses Tandy 1000 MS DOS.

10 Meg Internal \$549. External \$699.

20 Meg Internal \$749. External \$899.

42 Meg Internal \$1349. External \$1495.

10 Meg Internal for use with 2 disk drives \$569.

20 Meg Internal for use with 2 disk drives \$769.

Model 1, 3, 4 Hard Drives

	Primary	Secondary
5 Meg	\$795.	\$595.
10 Meg	\$1095.	\$895.
20 Meg	\$1295.	\$1095.
30 Meg	\$1895.	\$1695.

(Model 1 add \$50.)

Hard Drive Subsystem Features:

- All drive rated after formatting.
- Your choice of DOSPLUS, LDOS, or TRSDOS 6.X Drivers included.
- May be used with NEWDOS 80/Version 2.5
- Up to two secondary drives may be added.
- Error checking and correcting controller.
- Buffered seek drives for improved access time.
- Built in power up diagnostics.
- Plated media for long disk life.
- Heavy duty power supply.
- Gold connectors used.
- 1 year warranty.

Model 3/4 RS232 Kit \$69.

Model 3/4 Disk Controller Board \$99.

HARD DRIVE SPECIALIST

1-713-480-6000
 Order Line 1-800-231-6671
 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.

Step Up to .BAT

by Renato Reyes

If you use a Tandy 1000 or any other MS-DOS computer, an exploration of batch files is worth your while. A batch file is an ASCII text file containing a sequence of DOS commands or programs that DOS will execute for you. If you always type in the same sequence of commands to boot up your system or to run an applications program, a batch file will save you the effort.

The MS-DOS batch file facility is a small programming language that uses many commands you're already familiar with. Its more sophisticated features allow you to pass command line parameters, perform conditional tests, and execute loops similar to Basic's For...Next loops. With imagination, you can write utility programs that relieve you of many routine tasks.

Batch files are easy to create and maintain. You can build them with the EDLIN text editor supplied with MS-DOS or with any word processor that produces ASCII text. You can even use DeskMate's Text function if you remember to press the enter key at the end of each line.

All batch files have the .BAT extension. Let's create a simple batch file called STAT.BAT that displays the drive A directory, provides details of file allocation and memory use, and checks the system disk for errors. One way to create batch files (especially short ones) is to use the MS-DOS Copy command to copy text from your keyboard (CON) to a disk file. At the A> prompt, type in:

```
COPY CON: STAT.BAT
```

Then press the enter key. On the next line, begin entering commands (one per line). You may use DOS commands (and their associated command line parameters), batch commands (which I'll discuss later), or other executable programs (those with the extensions .COM or .EXE). For STAT.BAT, type:

```
DIR A:  
CHKDSK A:  
^Z
```

The last line tells the Copy command that you have finished entering text. Generate ^Z by pressing either the F6 key or the control-Z key combination. Control-Z is the MS-DOS end-of-file character.

The first line displays a directory of drive A. The second line invokes the MS-DOS CHKDSK.COM utility program, which provides useful information about disk storage and your computer's memory use. It also checks the disk in drive A for directory errors.

To invoke the batch file, type in STAT at

the A> prompt; the operating system automatically reads STAT.BAT and executes the commands as if each were entered individually from the keyboard.

As it processes the batch file, MS-DOS displays the commands on-screen, and the A> prompt disappears. When DOS finishes executing the last command in the file, the A> prompt reappears.

For execution, batch files pass commands to the MS-DOS command interpreter Command.COM. This means that you cannot use a batch file to pass keystrokes to programs that require them.

When naming a batch file, be careful not to duplicate the names of other executable files, since MS-DOS gives priority to files ending with the .COM or .EXE extensions. If, for example, you gave STAT.BAT the name CHKDSK.BAT, MS-DOS would not execute it. The operating system would recognize CHKDSK.COM first, and execute the utility instead of your batch file.

Instant Service

AUTOEXEC.BAT is a special batch file that MS-DOS executes whenever you boot up. You can use it to automate a set-up sequence on your system disk or to make a disk that automatically runs an application program when booted. You can, for instance, create a disk that automatically starts DeskMate with a one-line AUTOEXEC.BAT file:

```
DESK
```

When you boot the computer, MS-DOS looks for the AUTOEXEC.BAT file and executes the Desk command as if you had typed it in at the keyboard.

Since AUTOEXEC.BAT overrides the MS-DOS date and time prompts, it's a good idea to include them in your batch file if you need this information. Your batch file to invoke DeskMate might look like this:

```
DATE  
TIME  
DESK
```

Batch files let you switch drives, which means you can use AUTOEXEC.BAT to start up DeskMate even if the program is not on your system disk. Just change the file slightly:

```
DATE  
TIME  
B:  
DESK
```

and place the disk containing DeskMate in drive B. After you enter the time, MS-DOS switches to drive B and executes DeskMate from there. If you have only one drive in your Tandy 1000, don't worry:

You can still take advantage of this feature. MS-DOS treats a single drive as drives A and B; after you enter the time, the operating system prompts you to replace the disk intended for drive A with the one intended for drive B. When you make the switch, the batch file loads DeskMate.

Replaceable Parameters

Many MS-DOS commands accept parameters, which you assign at the time of execution. To execute the Type command, for instance, you must provide a file name. You could insert a file name in the batch file, but this limits its function to that one file. Suppose you want a generic batch file that executes tasks for a number of files or programs. Replaceable parameters provide the answer.

Replaceable parameters are variables you insert when you create a batch file. You replace them with real values (file names, disk drive names, program names, etc.) on the command line when you invoke the file. MS-DOS recognizes any number from zero through 9 preceded by a percent sign as a replaceable parameter. The parameter %0 is special in that it signifies the name of the batch file itself.

Assume you want to create a batch file called TypeMany.BAT that lists up to four text files to your display. Using replaceable parameters, your command sequence might look like this:

```
TYPE %1  
TYPE %2  
TYPE %3  
TYPE %4
```

When you invoke the file, you could enter up to four file names on the command line (separate each file name with a space). Let's say your four files are Letter, Report, Graph, and Notes. To invoke TypeMany.BAT, you would type this at the DOS prompt:

```
TYPEMANY LETTER REPORT GRAPH NOTES
```

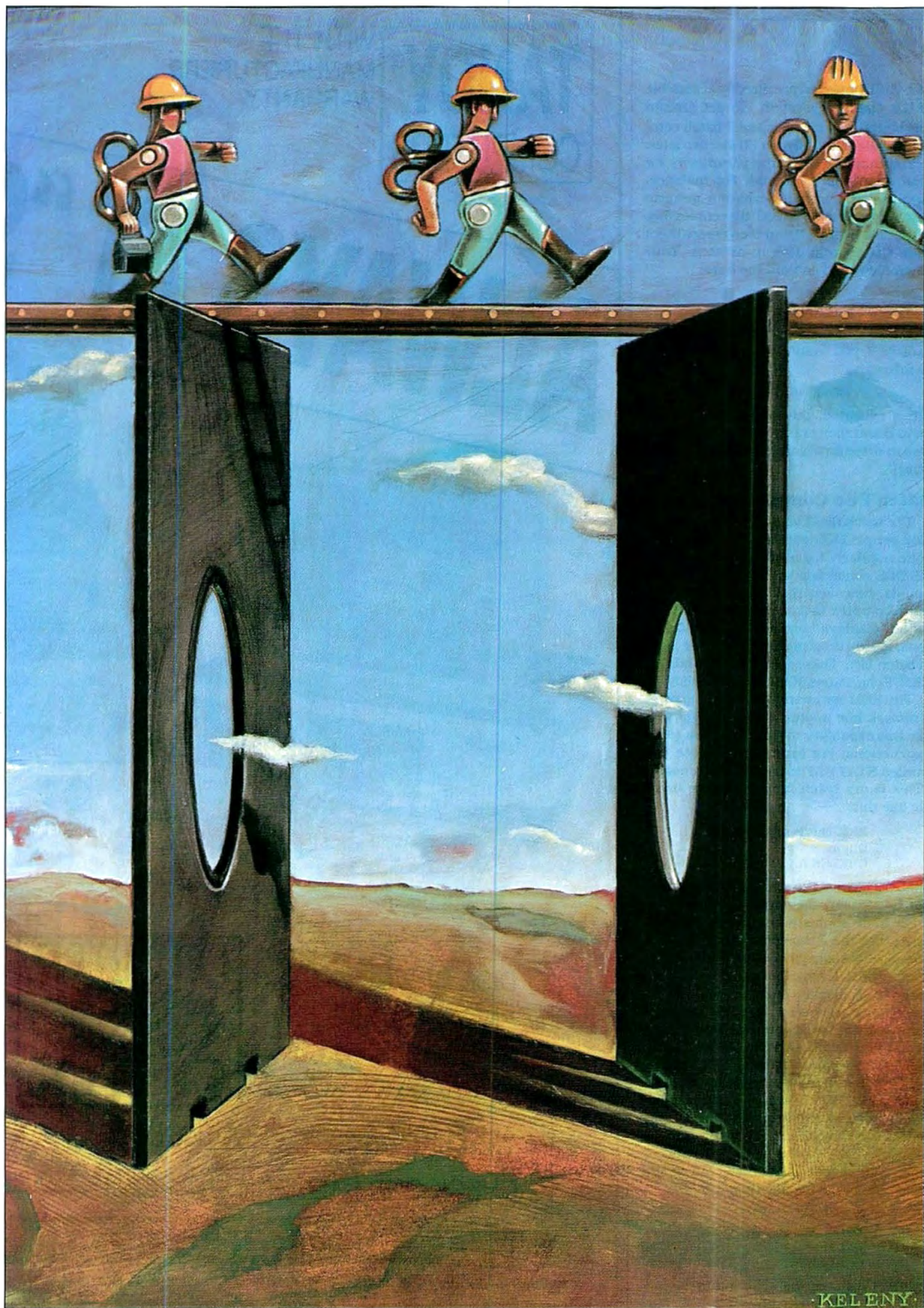
When MS-DOS executes the file, it replaces the %1 parameter with the Letter file, the %2 parameter with the Report file, and so on. If you create a batch file with four replaceable parameters, and your command line contains the names of only three files, the fourth Type command returns an error message.

You can place as many parameters in a batch file command line as you can fit (a total of 128 characters, including the name of the batch file). Only the first nine

System Requirements

Tandy 1000, 1200,
2000, and 3000

Let MS-DOS batch files do those routine jobs automatically.



KELENY

Illustration by Earl Keleny

(% 1 - %9), however, are directly accessible to the operating system. To get around this limitation, use the special batch command called Shift, which I'll discuss later.

You may use the same parameters for more than one command. For instance, suppose you want to create a generic batch file called Move.BAT that copies files to the disk in drive B and then erases them from the system disk in drive A. Your batch file would contain the lines:

```
COPY %1 %2
ERASE %1
```

If you wanted to move the file GRAF.BAS to drive B, you would invoke the batch file as follows:

```
MOVE GRAF.BAS B:
```

When executed, this copies Graf.BAS to drive B and then erases it from the system disk in drive A (which must be the default drive).

Batch File Commands

The batch files I've discussed so far employ simple DOS commands that you invoke regularly for routine system tasks. MS-DOS contains a special group of commands, however, that let you automate more complex tasks, such as formatting screen displays, performing conditional tests, and structuring GOTO and For loops in batch files. These special commands are REM, Echo, Pause, If, GOTO, For, and Shift.

The REM command allows you to place a remark line in your batch file. You can use this capability to display messages or instructions. For example, suppose you wanted STAT.BAT to display the message "This is my batch file." Write the batch file like this:

```
REM This is my batch file.
DIR A:
CHKDSK A:
```

MS-DOS ignores the remark during execution but displays the message on-screen.

For more sophisticated display of messages, use the Echo command to display messages or instructions but not batch file commands. Normally, each line of the batch file is displayed or "echoed" on the screen as it executes. You can suppress the display of batch commands by typing in the line ECHO OFF in the batch file. (Restore the echo with the line ECHO ON.)

To display messages, type in a line of text after ECHO; the words will appear on-screen when that line of the batch file executes. For instance, if you want only the message "Disk Status Utility" to appear when you invoke STAT.BAT, you would create the batch file like this:

```
ECHO OFF
ECHO Disk Status Utility
DIR A:
CHKDSK A:
```

MS-DOS restores the echo automatically after executing a batch file.

TANDY[®] COMPUTERS

WITH THE
MANUFACTURERS
WARRANTY

ALWAYS AT "S"



- DISK DRIVES
- PRINTERS
- MODEMS
- SOFTWARE
- ALL RADIO SHACK PRODUCTS



CHECK OUR SALE PRICES — CALL —

DFW COMPUTER CENTER

Customer Service 817-481-SALE (9 am-5 pm CT)

SALE" PRICES



Do You Want A Real Warranty. . .

or will you settle for a vague promise?

Since 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)

TOLL FREE 1-800-433-SALE

326 Main St. Grapevine, Texas 76051

TEXAS BUYERS ADD 5 1/8% SALES TAX.

In MS-DOS 2.11, if you type ECHO followed by two spaces, the operating system will print a blank line on the display without returning the status message. This is useful if you want to create attractive messages in your batch files. Later versions of MS-DOS, including MS-DOS 3.11 and PC-DOS 3.1, do not have this capability.

Replaceable parameters can also be used with Echo statements. Let's change Move.BAT slightly:

```
ECHO OFF
ECHO Transferring %1 to drive %2
COPY %1 %2
ERASE %1
```

When you invoke this batch file, you would replace the parameters %1 and %2 with the appropriate file and drive names:

```
MOVE GRAF.BAS B:
```

On execution, you would see the following screen display:

```
A> MOVE GRAF.BAS B:
Transferring GRAF.BAS to drive B:
1 file(s) copied
A>
```

When the echo is off, REM statements won't appear; they can be used to annotate long batch files.

The Pause command causes a batch file to stop executing and wait for you to press a key before continuing. On a single-drive system, for instance, you might use Pause to swap disks when copying files. When MS-DOS encounters this command, it stops the batch file and displays the message "Strike any key when ready." Perform whatever operation is called for at this point and press a key when you are done.

You can perform conditional tests in batch files with If statements. Three types of comparisons are possible:

```
IF string1 = =string2
IF exist filename.ext
IF ERRORLEVEL n
```

The first comparison tests for equivalence between two strings, the second tests whether the file you specify is present on the referenced directory, and the third tests for the exit code produced by some programs. To complete the If statement, you must add either a DOS command, the name of an executable file, or another batch command, which will be executed if the comparison is true.

When testing equivalence between strings, both strings must match exactly. Normally, you would use a replaceable parameter for one of the strings in order to control the flow of the batch file from the command line.

For example, suppose you created the batch file Hello.BAT with the following If statement:

```
IF %1 = =Dave ECHO Good morning, Dave!
```

If you invoke the batch file by typing in HELLO Dave, the message "Good morning, Dave!" will be echoed on-screen. Typ-

ing in HELLO DAVE or HELLO dave won't work because of the discrepancy in case.

A problem arises if you want to use an If statement to test for a nonexistent parameter. MS-DOS will reject an If statement in the format:

```
IF %1 = - ECHO "No parameter"
```

The solution is to use an additional character—the letter "X" for example—in both strings. The statement would then read:

```
IF X%1 = -X ECHO "No parameter"
```

In the second type of comparison (If exist filename.ext), the wildcard characters * and ? are acceptable to test whether the specified file is present on the referenced directory. Again, the file name can be a replaceable parameter to allow testing from the command line:

```
IF EXIST %1 ECHO "File found!"
```

With Exist, you can use the IfNot statement to test for the opposite condition as well:

```
IF NOT EXIST %1 ECHO "File not found!"
```

Since not all programs return meaningful exit codes, use the IF ERRORLEVEL n statement only if you know a program will return a code that can be tested. The condition is satisfied if the program returns a number, n, that is equal to or greater than the number specified in the IF ERRORLEVEL n statement.

Used in conjunction with If statements, GOTO commands cause the batch file to branch to a label within the file. MS-DOS recognizes any word preceded by a colon as a label. In the batch file command sequence:

```
:LOOP  
REM EXECUTING INFINITE LOOP  
GOTO LOOP
```

the line :LOOP is a label. The second line consists of a remark that will be displayed on-screen when the batch file executes. The GOTO in the last line forces the batch file to branch back to the :LOOP label. Notice that labels do not take colons when referenced in GOTO statements.

Like Basic's For...Next structure, the For command tells MS-DOS to repeat an assigned task for a set of parameters. The format is as follows:

```
FOR %%var IN (set) DO command %%var
```

Batch files require that you insert two percent signs before the variable ("var") in For loops. The set in parentheses may be anything, including file names, command strings, drive names, and even replaceable parameters. When you type them in, separate the set items with spaces.

For example, you could take a directory of three drives by typing in:

```
FOR %%F IN (A: B: C:) DO DIR %%F
```

For each execution of the DIR command, MS-DOS replaces the variable %%F with successive items in the set. The operating system moves through the set sequentially, and when it encounters the right pa-

renthesis, the For loop terminates.

If you make the items in the set replaceable parameters, you would enter the actual values when you invoke the batch file. To illustrate this, let's rewrite TypeMany.BAT as follows:

```
ECHO OFF  
FOR %%FILE IN (%1 %2 %3 %4 %5 %6 %7 %8 %9) DO TYPE %%FILE
```

This version lets you enter up to nine file names to be displayed on-screen when you invoke the batch file. In the first execution of the For loop, MS-DOS replaces %%FILE with the parameter %1, which you in turn replace with a real file name on the command line. On the second execution, %%FILE is replaced by %2, and so on. Since nonexistent parameters are replaced with nulls, you can enter fewer than nine file names on the command line and the For loop will terminate correctly. MS-DOS skips over the null parameters until it encounters the right parenthesis.

You can use the Shift command to access more than nine parameters on the command line. Each time it is executed, Shift moves the parameters on the command line one position to the left: the second parameter (%2) becomes the first parameter, the third (%3) becomes the second, and so on.

Mix and Batch

To demonstrate more sophisticated applications of batch commands, let's modify the TypeMany.BAT file we created previously:

```
ECHO OFF  
:LOOP  
IF X%1 = -X GOTO END  
TYPE %1  
SHIFT  
GOTO LOOP  
:END
```

The first line suppresses the on-screen echoing of batch commands. The third line is an If statement testing the presence of a parameter on the command line. If a parameter does exist, then the conditional test fails and control falls to the next line, TYPE %1.

Let's say you invoked this batch file by typing in:

```
TYPEMANY LETTER NOTES GRAPH REPORT  
When MS-DOS encounters the Letter file name as %1 on the command line, it lists it to the screen. The Shift command moves the parameters on the command line to the left, so that Notes replaces Letter as %1:
```

```
TYPEMANY NOTES GRAPH REPORT
```

The GOTO command on the next line causes the batch file to loop back to the line labeled :LOOP and repeats the process with the shifted parameters. When all parameters have been used, the If condition is satisfied, and control branches to the

label :END, terminating the file.

We can try another example by adding an error-checking capability to the Move.BAT file:

```
ECHO OFF  
IF NOT EXIST %1 GOTO ERROR  
ECHO Transferring %1 to drive %2  
COPY %1 %2  
ERASE %1  
GOTO END  
:ERROR  
ECHO File not found!  
:END
```

Line 2 tests to make sure that the file represented by %1 exists on the directory of the current drive. If it does, control falls to line 3, and the batch file executes normally. If the file represented by %1 is not in the current directory, then control branches to the :ERROR label, which echos the message "File not found!" on the screen.

Batches Within Batches

Since batch files normally return to DOS when they end, it's difficult to execute a batch file from within a batch file unless it happens to fall on the last line. For example, suppose you have a batch file called Test2.BAT that invokes another file called Test1.BAT:

```
REM Test1.bat  
ECHO This is test 1.  
  
REM Test2.bat  
ECHO This is test 2.  
Test 1  
ECHO This is test 2 again.
```

When Test2.BAT executes, the screen output appears like this:

```
This is test 2  
This is test 1
```

Since Test1.BAT returns to DOS, the last line of Test2.BAT never executes.

Fortunately, you can eliminate this problem with the MS-DOS command interpreter. If you load Command.COM on top of itself as a child process (/C), you can execute a batch file from within a batch file and return control to the first one. Try rewriting Test2.BAT so that the third line reads:

```
COMMAND/C Test1
```

This temporarily loads a copy of Command.COM in order to execute Test 1. You must use the /C switch.

Masters of Redirection

The MS-DOS redirection feature is particularly useful in batch files. Normally, MS-DOS receives input from the keyboard and sends output to the video monitor. You can change this, however, by using a redirection operator on the command line.

For example, if you want to send the output of a Type command to the printer, you could enter:

```
TYPE filename.ext >PRN
```

The greater than sign (>) is the output

redirection symbol; it tells the operating system to send output to the specified device (the printer) rather than to the default device (your screen). You can redirect output to any device or even to a disk file.

Using batch files and redirection of output, you can build a versatile dialer program that can be invoked from MS-DOS's A > prompt. Here's one called Dial.BAT, which I wrote for use with a Hayes modem:

```
ECHO OFF
REM DIAL.BAT—A simple batch dialer
ECHO ATDT %1 >COM1
ECHO Pick up the phone and
PAUSE
ECHO Z >COM1
```

To invoke Dial.BAT, type in DIAL followed by a phone number. The third line sends the output of the Echo statement to the COM1 device, the serial port to which the Hayes modem is connected. The Echo statement in line 4 and the Pause command in line 5 display the following message:

Pick up the phone and
Strike a key when ready. . .

When you strike a key, another Echo statement sends the character "Z" to COM1. This causes the Hayes modem to disconnect (as long as it hasn't detected

an answer tone). If you pick up the telephone before striking a key, you will hear a click as the modem hangs up, but the connection will be maintained.

I'll leave you with a modified version of Dial.BAT named Call.BAT (see the Program Listing) that uses familiar names to get the modem to dial a telephone number. The second line tests to make sure a parameter was entered on the command line. If no parameter exists, then control branches to the :END label. If a parameter does exist, then the third line branches to the label that matches the value you typed in for %1.

If you type in CALL ERIC, for example, the batch file will branch to the :ERIC label. The Echo statement causes the Hayes modem to dial 1-800-555-9191. Be sure to type the name on the command line exactly as it appears in the batch file. As soon as the number is sent to the modem, the batch file branches to the :HANGUP label, and you're prompted to pick up the phone and strike a key to disconnect the modem.

The # label lets you dial a number that is not in the file. It assumes that you entered a telephone number as the second parameter, %2, and sends that number to the modem. To use this, you would enter CALL # 555-1223 on the command line.

As you can see, the MS-DOS batch file facility is a powerful tool for automating routine tasks. With a little imagination, you can cook up a batch of time-saving recipes. ■

Renato Reyes is a freelance programmer, technical writer, and systems operator (sysop) of CompuServe's TRS-80 Professional Forum. He can be reached at 11621 Dennis Road #1025, Dallas, TX 75229.

Program Listing. Call.BAT, a batch file dialer for Hayes modems.

```
ECHO OFF
IF %1==X GOTO END
GOTO %1
:DAVE
ECHO ATDT555-4444 >COM1
GOTO HANGUP
:ERIC
ECHO ATDT1800555-9191 >COM1
GOTO HANGUP
:COPS
ECHO ATDT911 >COM1
GOTO HANGUP
:#
ECHO ATDT %2 >COM1
:HANGUP
ECHO Pick up the phone and
PAUSE
ECHO Z >COM1
:END
```

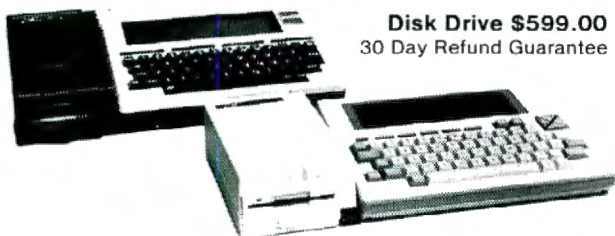
End

Circle 440 on Reader Service card.

Personal Integrated Computers

18013 SkyPark Circle, Ste. D., Irvine, CA 92714

COMPARE PERFORMANCE



Disk Drive \$599.00
30 Day Refund Guarantee

PICDISC

- Lg. package software
 - **360K** storage per disk
 - **318K** file size
 - **60x8** display
 - Rechargeable during use & powers your computer
 - OP system: **CP/M**
- Direct Disk Access**

TANDY

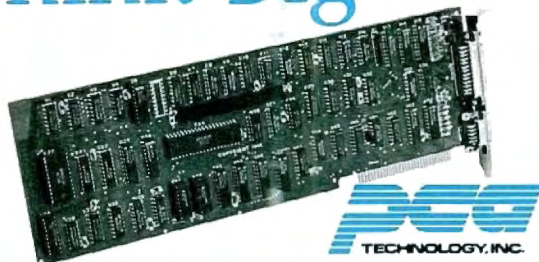
- No applic. software
- **100K** storage per disk
- **29K** max file size
- **40x8** display
- Not rechargeable
- OP system: **Load-Store Only**

**NOW: VIDEO INTERFACE
FREE BASIC INTERPRETER**

For catalog, literature 1-800-421-6300 1-714-261-0503
Trademarks: Tandy, Tandy Corp; Cp/M-Digital Research

Circle 492 on Reader Service card.

Think Big



The PCA Multiboard \$299 (Sugg. retail w/OK)
Up to 2MB and Multifunction for the Tandy 1000 and other compatibles.

Everything your Tandy 1000, 1200 HD or IBM compatible needs for big jobs, but for a small price. DMA on board, RS-232 port, clock/calendar, RAM Disk, Print Spooler, and up to 2MB of Lotus/Intel or DOS compatible memory. For less than the cost of most ordinary multifunction boards, get all the compatibility you'll ever need. Available now in 10" size (shown) for use up to 2MB.

To order or for more information call 714-991-3121
Ask us how to make your Tandy 100% compatible

Dealer inquiries invited. **PCC Technology**
Two Year Warranty 1440 S. State College #2E
Anaheim, CA 92806
*Includes DMA for Tandy 1000, \$279 without DMA

A Display of Character

Finally—PEEKs and POKEs for the Model 4 screen.

One of Model 4 Basic's shortcomings is its failure to provide screen PEEKs and POKEs, which are useful in word processing, graphics, games, and other applications. I wrote a short routine called PEEKPOKE that you can merge with Basic programs requiring PEEK and POKE commands.

Running the Program

Type in Program Listing 1 and save it to disk with the ASCII option (SAVE "PEEK-POKE/ASC",A). Now you can merge the routine with another Basic program.

To place a character on the screen, your Basic program must contain the command:

```
CALL POAK (X%,Y%,C%)
```

where X is an integer from zero to 23 (the row of the screen location where you want to POKE the character), Y is an integer from zero to 79 (the column), and C is an integer from zero to 255 (the decimal ASCII code of the character you're POKEing).

To read a screen character, enter:

```
CALL PEAK (X%,Y%)
```

where X and Y have the same range as above. The variable CHAR% returns the character PEEKed from the display. To print CHAR% to the screen, use the statement PRINT CHR\$(CHAR%).

Before using PEEKPOKE, you must add PEAK, POAK, CHAR%, and ASSEMBLY\$ to the list of Basic reserved words.

These commands have some limitations you should be aware of. First, the parameters X, Y, and C must be variables. You can't use constants directly, as in CALL POAK (10,20,56). You can assign the variables any legal name you choose. Second, the variables must be integer variables: Their names must end with the % sign or you must define them as integers with the DEFINT command. Finally, operations are not allowed in the parameter list. For instance, CALL PEAK (Z%,B% + A%) will not work.

Despite these limitations, the commands are extremely versatile. Let's say you want to PEEK the entire screen and store the data in an array called Screen (you will probably prefer to use a disk file and save the 6K of memory this array requires). Merge Program Listing 2 with

PEEKPOKE/ASC and run the combined program for a demonstration.

How It Works

As you can see in Listing 1, I assigned the variable ASSEMBLY\$ a length of 26 characters (line 1). In line 2, the program reads the machine-language data in lines 7 and 8 and POKEs it into ASSEMBLY\$. The variable CHAR% contains the character PEEKed from the display. The Basic program gets the address of CHAR% (lines 3 and 4) and POKEs it into the machine-language subroutine in line 5. Line 6 sets the variables used in PEEKPOKE to zero so

they won't conflict with variables in the Basic program you merge with the routine.

Program Listing 3 shows the source code I used to generate PEEKPOKE's machine code. Listing 3a shows the PEEK subroutine's source code and corresponds to line 7 in Listing 1. Program Listing 3b shows the POKE subroutine's source code and corresponds to line 8 in Listing 1. I wrote the subroutines independently so you can PEEK or POKE separately. ■

You can reach Roberto Refinetti at the Department of Psychology, University of California, Santa Barbara, CA 93106.

Program Listing 1. PEEKPOKE.

```
1 ASSEMBLY$=STRING$(26,32) : A=VARPTR(ASSEMBLY$)+1 :
  A=PEEK(A)+PEEK(A+1)*256
2 FOR I=0 TO 25 : READ B% : POKE A+I,B% : NEXT : RESTORE
3 CHAR%=1 : A2=VARPTR(CHAR%) : IF A2<0 THEN A2=A2+65536!
4 B2%=INT(A2/256) : B1%=INT((A2/256-B2%)*256)
5 POKE A+10,B1% : POKE A+11,B2% : PEAK=A : POAK=A+14
6 A=0 : B%=0 : A2=0 : B1%=0 : B2%=0 : I=0
7 DATA 126,103,26,111,62,15,6,1,239,33,32,32,119,201
8 DATA 126,103,26,111,10,79,62,15,6,2,239,201
```

End

Program Listing 2. Demonstration program. Merge with Program Listing 1.

```
10 DIM SCREEN(1920)
20 FOR X%=0 TO 23 : FOR Y%=0 TO 79
30 CALL PEAK (X%,Y%) : SCREEN(I)=CHAR%
40 I=I+1:NEXT Y%,X%
50 CLS:I=0
60 FOR K%=0 TO 23 : FOR J%=0 TO 79
70 L%=SCREEN(I)
80 CALL POAK (K%,J%,L%)
90 I=I+1:NEXT J%,K%
```

End

Program Listing 3. Source code for PEEKPOKE. a) Source code for PEEK.

```
ORG 65509 ;DUMMY ORIGIN (ASSEMBLY$ will be used)
@VDCTL EQU 15 ;DECLARE VIDEO SVC
ADDRESS EQU 65535 ;DUMMY ADDRESS (CHAR% will be used)
BEGIN LD A,(HL) ;GET X FROM BASIC
LD H,A ;AND PUT IT HERE
LD A,(DE) ;GET Y FROM BASIC
LD L,A ;AND PUT IT HERE
LD A,@VDCTL ;SELECT SVC
LD B,1 ;SELECT PEEK FUNCTION
RST 28H ;RUN SVC
LD HL,ADDRESS ;GET RETURN ADDRESS
LD (HL),A ;AND PUT RESULT THERE
RET ;RETURN TO BASIC
END
```

End

b) Source code for POKE.

```
ORG 65509 ;DUMMY ORIGIN (ASSEMBLY$ will be used)
@VDCTL EQU 15 ;DECLARE VIDEO SVC
BEGIN LD A,(HL) ;GET X FROM BASIC
LD H,A ;AND PUT IT HERE
LD A,(DE) ;GET Y FROM BASIC
LD L,A ;AND PUT IT HERE
LD A,(BC) ;GET CHARACTER FROM BASIC
LD C,A ;AND PUT IT HERE
LD A,@VDCTL ;SELECT SVC
LD B,2 ;SELECT POKE FUNCTION
RST 28H ;RUN SVC
RET ;RETURN TO BASIC
END
```

End

System Requirements

Model 4/4P/4D
Basic

More Software from the Creators of Super Utility™

>> All products shipped from stock within 24 working hours! <<

SuperCross/XT

Easily Move Files from the TRS-80™
to MS-DOS™ or CP/M™ and back!

80-MICRO summed it up; "The value of this program far exceeds its price... If you work with different computers, it's a must."

See the 4-STAR Review in the July 1985 issue

HUNDREDS OF ENTHUSIASTIC COMPLIMENTS ON FILE!
"Don't be confused by competitors that are really BASIC translators with very limited file transfer capabilities!"

SuperCROSS/XT will allow you to MOVE files back and forth between different operating systems, including PC/MS-DOS 1.x, 2.x/3.x (single or double-sided), CP/M+, or CP/M 2.2 on your TRS-80™ Model 4/4P, III, or VDD. You can do this with your existing hardware and SuperCROSS/XT, eliminating modems, cables, and terminal program transfers. SuperCROSS/XT runs as a /CMD file under your TRS-80 operating system. Data files, spreadsheet files, and text files can be moved between machines. For example, years of Visicalc™ files, business letters, legal drafts, text files, PFS files, or medical records can now be utilized on your new machine!

Comments and letters on-file from registered users are unusually enthusiastic about this product and its ease of use. It WILL do what you think it will do, it's easy, and it WORKS GREAT! New features in SuperCROSS/XT include "tagging" files for multiple COPY's or KILL's to eliminate many unnecessary keystrokes!

CNVBASIC/CMD, available separately, "prep" your BASIC programs before sending over with SuperCROSS/XT. It will make most of the syntax and spacing changes required for converting Model I/III BASIC programs for use on GW-BASIC, CP/M BASIC, or Model 4 BASIC. Complex or commercial business packages written in BASIC probably will not convert 100% over by our or any other BASIC translator.

Important! Specify Model I/DD, III, or 4 computer type required.

SuperCross/XT (70 different disk formats)	\$ 99.95
CNVBASIC/CMD alone	\$ 29.95
*BOTH! - COMBO Special! - Save \$10!	\$119.95

Tandy 1000 and other PC compatible users:

Do you have problems with copy-protected disks on your Tandy 1000, 1200, 3000, IBM, or other PC compatible? We don't mean trading software, but making archival backups of your purchased MASTER disks and running your protected business applications from your hard disk. We have a program called COPY II PC that will handle these tasks for you. COPY II PC will backup most protected PC software. It also makes using your hard disk as convenient as it was designed to be! No longer will you need to use a "key disk" on most software (applications - not games). You can run directly from your hard disk with NOKEY, included with the COPY II PC package. Insert NOKEY in your BATCH file for fast, easy, automatic execution of your "protected" applications. This is sold for making archival backups of your own purchased software for your own use or running from your own hard drive only. TANDY 1000 requires memory card because of needed DMA chip that resides there. >> Not for Tandy 2000 <<
Minimum requirements: TANDY 1000 (memory board required), 1200, 3000, IBM™ PC™, XT™, AT™, or other "real" compatibles including Leading Edge, AT&T 6300, Compaq, etc. One or two disk drives and at least 128K required on most machines.

COPYII PC with Nokey - only \$39.95

PowerSCRIPT 4.2 for Model 4, III, & I

Do you really like SCRIPSIT™, but wish it did a whole lot more? You'd like a lot of new features without having to relearn a whole new system or spending much additional money? Our PowerScript 4.2 is just the answer. PowerScript 4.2 adds two categories of additions to SCRIPSIT™. Directory/File functions (DIR, FREE, KILL, CHAIN, LINK), and embedded printer control functions. With all the smarter printers out there, it doesn't make any sense to use a "dumb" word-processor anymore. In this case, "dumb" means it can't really control your printer to its fullest capacity. If you notice, there are many word processors out there for the TRS-80™ besides the ones from Tandy. We could recommend any one of these, IF YOU WANTED TO BUY SOMETHING NEW. One of the problems, however, is that you need to learn all new commands. The second problem (maybe the main one) is that you need to shell out a lot more money to buy it! PowerSCRIPT 4.2 gives you many new features, while retaining the commands you already know - at a very low price! All our previous files will, of course, be compatible. PowerScript 4.2 received a 4 1/2 star rating in 80-MICRO's July '85 issue. Supports Mod I, III, and 4 versions of SCRIPSIT™ (Ownership of SCRIPSIT™ required).

Add all this power to your program for only \$39.95!

Reference Manual for Scripsit™

New! Contains easy to follow instructions on getting the most from SCRIPSIT™ for Mod I, III, or 4! Explains all the mysteries and ends confusion on commands you never understood! Meant to supplement your manual, but will stand alone in its completeness. Contains extensive Index to the Tandy VIII manual. **only \$7.95!**

SUPER UTILITY™ Combo Specials

Our ever-popular book INSIDE SU+ 3.x has been revised and renamed to now include all the changes that have occurred in the past two years since it was last revised. This perfect-bound, large format, slick 100 page+ book explains all the ins and outs of using these powerful utilities to the fullest of their capabilities. If you own SU+ 3.x, SU4/4P, or PowerTOOL this book will really add to your knowledge and maybe explain some things you didn't understand before. Lots of tips, hints, and suggestions are included, as well as helpful information for the novice as well as the "pro". Disk theory is explained as well. The book is now shipping, and a real value at only \$19.95, its list price, but this month we're offering it for **only \$15! Save \$5!** If you are a new Model 4 owner and a new SU4 owner as well, then **NOW** is the time to get some great info!

Don't own Super Utility yet?? Buy our world-famous SUPER UTILITY+ 3.2 or SUPER UTILITY 4/4P and add our new edition of USING SUPER UTILITY for only \$5 extra! Save \$15! This program will amaze you. There is NO WAY to tell you in this space how powerful SUPER UTILITY really is, but literally thousands all over the world have written their praises of this program. Don't delay! You wouldn't believe how many of these we Federal Express to people who need it "yesterday"! Think of SU as date insurance. You can't go wrong.

Super Utility+ 3.2 for the TRS-80™ I, III, 4(III)	\$79.95
Super Utility 4 for the TRS-80™ Model 4/4P/4D	\$79.95
USING SUPER UTILITY Book Sale price	\$15.00

Special combo! SU with new book for only \$84.95! Save \$15!

Super Utility for the TRS-80 is "protected". It comes with two copies of the program, however. Upon registering, you may order an unprotected copy for \$20 (U.S.) at your option.

Super Utility/PC for PC/MS-DOS - unprotected -	\$89.95
--	---------

Do you use a hard drive on your TRS-80?

We have a complete line of Supreme Hard Disk Driver packages that offer much greater flexibility and superior performance over the standard drivers supplied by Tandy or other hard drive manufacturers for the TRS-80 Mod 4, III, or I. They allow you to split up your hard drive into partitions of differing sizes, and also allow you to define granule sizes and other optimizing operating characteristics to achieve maximum use from your drive. The drivers (once relocated) are very small; less than 256 bytes. Most hard drive companies either sell or recommend our drivers. These drivers can also be used to allow a hard drive to be shared between LDOS 5.1 and TRSDOS™ 6 for Model 4 owners! If you have the 15 meg or 35 meg Tandy drive, you can now format it for full usage (Mod I, III or 4 mode)! If you have a 4P, you can boot directly off the Tandy hard drive in Mod 4 mode without a disk! Call or write for complete details. **only \$99**

Whether you use our software driver or not, you NEED to use BACK/REST! Shame on you if you're not backing up your data!

>> See the 5-Star review in the Oct'85 Issue! <<

If you've invested good money into a hard drive system, it doesn't make any sense not to have a BACKUP routine. BACK/REST makes that job easier and saves much time. And TIME IS MONEY. Don't delay! Save HOURS! BACK/REST will work with all hard drives that use LDOS or TRSDOS 6 (all versions including 6.2.1).

Hard Drive COMBO Specials!

BACK/REST 1.3 for TRSDOS 6™ & LDOS	\$ 99.95
LDOS ToolBox	\$ 49.95
Hard Disk Repair & Recovery Tools for LDOS - Mod I/III Model 4 ToolBelt	\$ 49.95
Hard Disk Repair & Recovery Tools for TRSDOS 6 - Mod 4, 4P, 4D Mod 4 ToolBelt and LDOS ToolBox Combo	\$ 75.00
useful if your hard drive is split Mod 4 and III	
BACK/REST and your choice of TOOLBOX for LDOS or MOD 4 TOOLBELT	\$139.95
BACK/REST and BOTH sets of tools	\$159.95
BACK/REST and our Supreme Hard Drive* (save \$50!)	\$149.95
*add either LDOS TOOLBOX or Model 4 ToolBelt for only \$29.95 more!	

Fine print: Visa or MasterCard gladly accepted. Flat rate shipping on any item or combination of items from this ad is only \$3 (UPS ground). Blue Label or overnight available at extra cost (\$3 and \$13.50). COD orders will have \$3 added to the total. Canadian airmail is \$4 and other foreign airmail will be actual cost. Foreign customers, please use charge card ONLY. Checks and orders not drawn on US banks will be returned. **Specials end 5-30-86. Texas residents must add appropriate sales tax.**



POWERSOFT

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



Counter Intelligence

Tracking down Assembly-language program bugs is a snap with this simple Model III trace utility.

Owners of sophisticated operating systems like LDOS know how useful it is to have a trace utility for locating Assembly-language program bugs. Unfortunately, TRSDOS 1.3 owners don't have such a tool. To fill this void, I've written Trace, a TRSDOS 1.3 utility that operates much like its Basic counterpart, TRON. In addition to TRSDOS 1.3, Trace will run under DOSPLUS 3.x and MULTIDOS 1.x. It will not run under CDOS 5.x without modifications.

Trace Elements

After typing in the Program Listing and assembling it to disk, you activate Trace from DOS ready with a command in the format:

```
TRACE DELAY = nnnn
```

(You can use Trace only on drive zero.) Then load the Assembly-language program you want to trace.

Trace displays the hexadecimal (hex) value of the program counter in the upper-right corner of the screen. The hex value is the address of the next instruction that the program will execute upon leaving the interrupt handler. Because Trace is interrupt-driven, the value is refreshed every time a real-time clock interrupt occurs (30 times per second). To make the value easier to read, you may set the delay parameter (a four-digit hex value) to make the computer run up to 30 times slower. The value 0000 gives the shortest delay; FFFF gives the longest. If you omit the delay parameter, the program assumes a delay of 0000 hex (real-time execution).

For example, you could simply type in the command TRACE, which activates



System Requirements

Model III
TRSDOS 1.3
Assembly language
Editor/assembler

Program Listing. Trace.

```

00010 ;* Program Counter Trace Utility by Craig Chaiken *
00020 START EQU 0FE80H
00030 MEMEND EQU 4411H
00040 PATCH EQU 4013H
00050 DELAY EQU 0060H
00060 PRINT EQU 021BH
00070 DOS EQU 402DH
00080 ORG START
00090 LD DE,0001H ;Set Default Delay
00100 LD (SDELAY),DE
00110 SWITCH LD A,(HL) ;Get ON or OFF Switch
00120 CP 0DH
00130 JR Z,TRON
00140 CP '='
00150 JR Z,GETDEL
00160 CP 'P' ;Any Parameter with
00170 JR Z,TROFF ; an P = OFF
00180 INC HL
00190 JR SWITCH
00200 GETDEL EX DE,HL
00210 INC DE
00220 LD HL,0000H
00230 LD B,4
00240 NXTNIB ADD HL,HL ;Shift In Next Nibble
00250 ADD HL,HL
00260 ADD HL,HL
00270 ADD HL,HL
00280 LD A,(DE)
00290 INC DE
00300 CALL ASCNIB
00310 ADD A,L
00320 LD L,A
00330 DJNZ NXTNIB
00340 INC HL ;Store Delay Length
00350 LD (SDELAY),HL
00360 TRON LD HL,(MEMEND) ;Install Trace
00370 LD (SMMEND),HL ; and Protect Memory
00380 LD HL,TRACE
00390 LD (MEMEND),HL
00400 LD (PATCH),HL
00410 RET
00420 TROFF LD HL,3018H ;Disable Trace
00430 LD (PATCH),HL ; and Unprotect Memory
00440 LD HL,(SMMEND)
00450 LD (MEMEND),HL
00460 RET
00470 TRACE DI ;Get Contents on Top
00480 EXX ; of Stack
00490 EX AF,AF'
00500 EX (SP),HL
00510 LD D,H
00520 LD E,L
00530 EX (SP),BL
00540 LD A,E
00550 CALL CNVERT ;Convert to ASCII
00560 LD (3C3EH),HL ; and Display
00570 LD A,D
00580 CALL CNVERT
00590 LD (3C3CH),HL
00600 LD BC,(SDELAY)
00610 CALL DELAY
00620 EX AF,AF'
00630 EXX
00640 JP 3018H ;Jump to ROM Interrupt
00650 ; Handler
00660 CNVERT LD B,A ;Convert 8 Bit Binary
00670 CALL NIBASC ; In Accumulator
00680 LD I,A
00690 LD A,B
00700 RRA
00710 RRA

```

Listing continued

Listing continued

```

00720      RRA
00730      RRA
00740      CALL      NIBASC
00750      LD          L,A
00760      RET
00770 NIBASC AND      0FH          ;AND 00001111B
00780                      ;Convert Nibble to ASCII
00790      ADD      A,90H
00800      DAA
00810      ADC      A,40H
00820      DAA
00830      RET
00840 ASCNIB SUB      30H          ;Convert ASCII Character
00850      CP       0AH          ; To A Binary Nibble
00860      RET      C
00870      SUB      07H
00880      CP       10H
00890      RET      C
00900      LD      HL,ERROR
00910      CALL   PRINT
00920      JP      DOS
00930 ERROR DEFM   '*** Parameter Error ***',13
00940 SMMEND DEFS  2
00950 SDELAY DEFS  2
00960      END      START

```

End

the utility and sets the delay to 0000 hex. The command TRACE DELAY = 8000 activates the utility and sets the delay to 8000 hex, around 15 times slower than real-time execution. The command TRACE DELAY = FFFF activates the utility and sets the delay to FFFF hex, 30 times slower than real-time execution. To deactivate the utility, type in TRACE OFF or any sequence containing an F (for example, TRACE F). When using Trace with

a delay greater than 1000, do not attempt to access any drive other than zero.

Trace begins by storing its entry point within the vector of the TRS-80's real-time interrupt handler. Since this sends control to the routine upon any real-time interrupt, you cannot trace interrupt-driven or interrupt-disabling routines. Trace varies the computer's execution speed by calling a time delay before reenabling real-time interrupts.

A Final Note

Among other uses, I depend on Trace for determining when I have a program crash or just an infinite loop. Telling the difference without such a utility is virtually impossible. I also use the utility to locate routines that execute frequently so I can optimize their code. Trace's ability to determine the contents of the program counter makes it a powerful development tool—one that I couldn't now do without. ■

An instructor in the University of Hartford's Department of Engineering, Craig Chaiken has been working with computers for over five years. You may write to him at 32 Beverly Drive, Avon, CT 06001.

Related Articles

Hunter, Stewart F., "Power Lines," January 1986, p. 80. Streamline Basic by identifying lines that execute most frequently on Models I and III.

Rohde, Arnc. "Clean Up Your TRON/TROFF," November 1982, p. 406. A Basic trace table to avoid a cluttered Model I screen.

Smith, Alan D., "BASTEP," January 1983, p. 352. A debugging monitor for Basic on the Model I.

Circle 286 on Reader Service card.



MORE MUSCLE FOR YOUR TANDY 1000—LESS MONEY

Why spend more to expand your Tandy 1000 to 640K when you can spend less and still get more features on a single board!

The EPD Half Megaboard + DMA gives you:

Up to 512K additional memory

Serial port

Clock/calendar

DMA

RAM disk & print spooling software

2 year warranty

512K RAM

for less! \$259

(0K)

\$80 additional = \$339.00

The EPD Half Megaboard + DMA is the price/performance leader! Maximize limited expansion slots! Give your Tandy all the features you'll need without paying for the "extras" you won't even use.

EPD also provides complete customer service and technical support. So if you need someone to talk to, we're here.

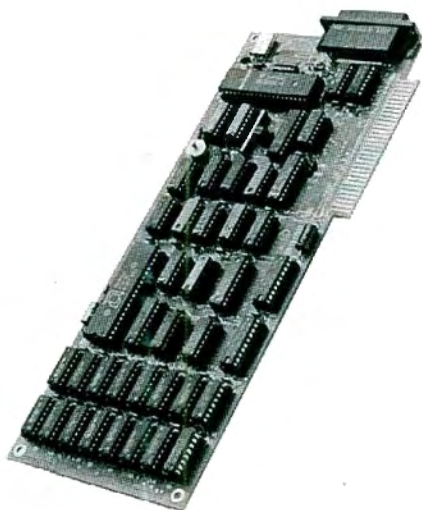
Call EPD today and get the best features for the best price!

(800) 424-2107 (outside California)

(714) 832-7811 (in California)

EXCELLENT DEALER PROGRAM!

® Tandy is a registered trademark of Tandy Corporation.



Attention! Tandy 1000 Fans!

Introducing . . .

80 Micro's Starter Pack 1000

A computer as powerful and versatile as the Tandy 1000 calls for software to match. That's why you and your computer need 80 Micro's Starter Pack 1000. Designed exclusively for Tandy 1000 users, the Starter Pack disk contains 13 essential, educational, and entertaining programs, selected for you by the editors of 80 Micro.

You Want It . . . You Got It!

Whether you want to tame your finances, plan a schedule, perform a calculation, or write a letter, the Starter Pack 1000 can help you do it better. Check the lineup! Here's the entire list of 13 Starter Pack programs you can use and enjoy right away:

- **Letter Perfect** -- spelling checker program for ASCII files that works with Deskmate.
- **In the Marketplace** -- commodities futures trading simulator.
- **Time Keeper** -- manages several projects simultaneously, and calculates time spent on each project.
- **Clear-Cut Trends** -- draws, displays, and prints hi-res line and bar graphs.
- **Don't be Late** -- critical path scheduling brings your projects in on time.
- **Made-to-Order Sorts** -- creates custom sorts by answering 10 prompts.
- **Next Generation Software** -- recreates the agricultural experiments of Gregor Mendel.
- **Savings and Loan** -- compares payment schedules calculated by simple interest and by the Rule of 78's.
- **Putting Things Precisely** -- makes Basic programs more accurate with routines that calculate values with up to 16 digits.
- **Finding Your Roots** -- solves linear or non-linear equations for their roots.
- **To Each His Own** -- lets you set up your own data base manager.
- **Screen Save** -- memory-resident program that blanks out your screen to avoid unnecessary wear and tear.
- **MicroTab** -- tabulates the results of opinion polls.

Tandy 1000 is a registered trademark of Tandy Corporation



Docs on Disk

The Starter Pack is an easy and cost-effective way to build your library of Tandy 1000 software. Documentation? No problem! Full instructions for running the programs are contained on each Starter Pack disk. Read the docs right on the screen or print them out for reference.

Value -- in the 80 Micro Tradition

It's a terrific value. You get all 13 programs for your Tandy 1000, complete documentation, plus the confidence of ordering from 80 Micro, the #1 magazine for Tandy users. All for just \$26.50 postpaid.

Place your order today. Simply return the coupon or the attached order card, or call toll-free 1-800-258-5473. (In NH, please dial 1-924-9471.)

YES! Send me the high-powered 80 Micro Starter Pack 1000 disk at \$26.50 ea. (Price includes postage and handling.)		5-86-SI	
<input type="checkbox"/> Payment Enclosed	<input type="checkbox"/> MC	<input type="checkbox"/> AE	<input type="checkbox"/> VISA
Card # _____	Exp. Date _____		
Signature _____			
Name _____			
Address _____			
City _____	State _____	Zip _____	
Available in May 1986.			
LOAD 80 • 80 PINE STREET • PETERBOROUGH, NH 03458			



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 \$ 64 /
 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 3.3 (Specify MM or R/S format)	\$ 195
MailMerge SM , SpellStar SM , Starindex SM , all 3 for just	99
WordStar Professional (Above 4 Programs)	275
DataStar SM Data Entry & Retrieval	125
ReportStar SM Report Generator	105
InfoStar SM Advanced DBMS (Above 2 Programs)	195
dBASE II SM 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	179
2-12-16. Floppy Version	219
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 n.c. 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**

Ports Illustrated

A Better Serial Interface

Most of you are familiar with the RS-232C serial communications interface and have probably used it for telecommunicating or transferring files between computers. The RS-232C is one of the most widely accepted standards in use today. However, this 17-year-old interface has several limitations. This month, I'll discuss the RS-422A interface, which uses newer technology to overcome the RS-232C's limitations. The accompanying project is an RS-232C/RS-422A converter board (see Photos 1 and 2).

Where the RS-232C Falls Short

Before going into the benefits of the RS-422A interface, I'll describe some of the deficiencies of the older RS-232C (see Fig. 1). These limitations, which are somewhat interrelated, fall into four main categories: distance, speed, power supply, and signal integrity.

First, the RS-232C's maximum cable run specification is only 50 feet (although the interface is often used over greater distances). This means that many companies with time-sharing systems must use a 20-milliamp (mA) current loop or other interface for terminal hookups, since most terminals are much farther than 50 feet from the host system.

The second limitation is speed or, more specifically, the lack of it. According to its specifications, the RS-232C can handle data rates up to 20K bits per second (Kbps). While 20 Kbps is generally the limit of most asynchronous systems, it is slow for synchronous systems, which typically reach 1 million bits per second (Mbps) or higher.

Third, the RS-232C requires a \pm power supply, which can be a problem. While the power supply is usually $\pm 12V$, it may be anywhere in the range $\pm 3V$ to $\pm 25V$. Since nearly all digital systems require only +5V, requiring a \pm supply (of generally higher voltage) is a nu-

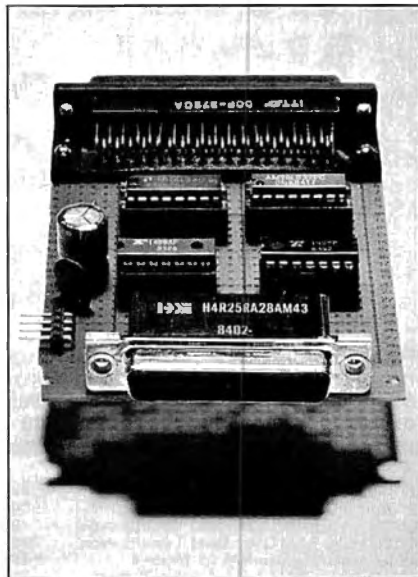


Photo 1. RS-232C end of converter board.

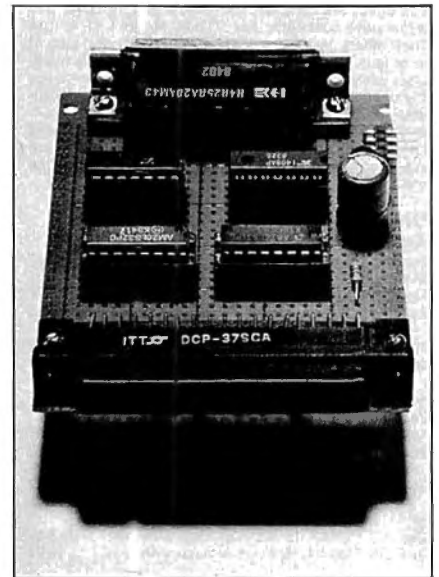


Photo 2. RS-422A end of converter board.

Quantity	Description	Distributor	Part Number	Price (each)
1	1488 Quad RS-232C line driver	JDR	LM1488	.49
1	1489A Quad RS-232C line receiver	JDR	LM1489	.49
1	26LS31 Quad RS-422A line driver	JE	DS26LS31CN	1.49
1	26LS32 Quad RS-422A line receiver	JE	DS26LS32CN	1.49
1	DB-25S/RA DB-25S connector (right angle)	JDR	DB25SR	2.00
1	DB-37S/RA DB-37S connector (right angle)	JDR	DB37SR	2.79
1	4.7 Kohm Resistor, 1/4 watt, 5%	JE		0.06
1	.01 μ F/50V Capacitor, ceramic disc	JDR		0.12
1	47 μ F/35V Capacitor, electrolytic, radial	JDR		0.18
1	Prototype board (2.5 inches by 4.5 inches)	JDR	P25 x 45	2.40

Parts Distributors

JDR Microdevices (JDR), 1224 S. Bascom Ave., San Jose, CA 95128, 800-538-5000 or 408-995-5430 outside CA; 800-662-6279 inside CA.

Jameco Electronics (JE), 1355 Shoreway Road, Belmont, CA 94002, 415-592-8097.

Table. Parts list for RS-232C/RS-422A converter board.

System Requirements

RS-232C port

ANNOUNCING The NEW MISOSYS

News Flash! Effective March 1, 1986, MISOSYS acquires the entire retail operation and product line of Logical Systems, Inc. All previous LSI products are now sold and supported by MISOSYS. To help us share in the celebration of this acquisition, we are offering fantastic bargains on the Little Brother Data Manager, A Model 4 BASIC Enhancement package, THE SOURCE to TRSDOS 6.2, and new low prices on LDOS™. We have even added a toll-free ORDER line! Call us at 800-MISOSYS to place your order!

ON SALE

LITTLE BROTHER DATA MANAGER

"... a lot of versatility in such an inexpensive program." *Harden 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 **\$74.95 + \$3 S&H**
(Regular \$99)

SPECIAL

Bolster Model 4 BASIC

- BEEP—Adds 13 enhancements and extensions to BASIC (reviewed July 1985 issue of 80 MICROCOMPUTING)
- BSORT—Multi-keyed, tagged, array sort invocable from BASIC
- LS-TBA—The BASIC Answer is a structured BASIC translator
- LS-LED—The LDOS™ text editor is great for creating TBA source

All 4 packages **\$59.95 + \$3 S&H**
(Regular \$156)

ON SALE

THE SOURCE

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: \$99.95 + 5 S&H
(Regular \$249)

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**
- smallLDOS™ 5.1.4—a powerful subset of big LDOS™ with a complete user handbook **\$29.95 + \$3 S&H**
(Previously \$39)
- The complete LDOS™ system: 5.1.4 disk plus 400 page manual **\$49.95 + \$5 S&H**
(Previously \$69)
- LDOS™ binder e/w tabs \$5.00 extra

NEW

PRO-NTO Application Pac Mister ED

- 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 **\$59.95 + \$3 S&H**
(Requires PRO-NTO)

NEW C

Model 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-HartFORTH—A full 1979 STANDARD FORTH compiler; runs under TRSDOS 6. Floating point! Access DOS files! Editor! Graphics! **\$74.95 + \$3 S&H**

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

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.

Sale prices are good through May 30th, 1986. VA residents add 4% sales tax. S&H shown for US only. CANADA add \$1 per item. Foreign multiply S&H times 3.

Please specify your computer type and DOS used.
Call or write for extensive catalog of Model III/IV & MS-DOS software.

“And the winner is . . .”

80 Micro's

Best of the Model 4

With Complete Documentation

Never before has one disk contained so many top-notch programs for Tandy Model 4 users! Introducing . . . 80 Micro's "Best of the Model 4." One dozen of the most powerful and practical ready-to-run programs, selected by 80 Micro's experts as the all-time best.

Money-savers and power boosters

You'll work smarter with business programs like "Time Keeper" and Hardin Brothers' "Basic Data Base Management System." Included are programs such as:

- **A Happy Medium**—lets you run Model I/III cassette software in your Model 4.
- **Convert**—Turns Model III Basic programs into Model 4 Basic.
- **Autorun**—Puts Model 100-style bar cursor directories on your Model 4.

The ultimate in Model 4 productivity

You'll also get more out of your computer with such "Best of the Model 4" selections as:

- **Extra Strength DOS**—sets up JCL to automatically configure DOS.
- **Scripaid**—reassigns Scripsit's command keys, provides on-screen text preview, and more.
- **Command Performance**—Edits your JCL files and automatically executes TRSDOS commands.
- **Restored Art**—puts graphics commands Set, Reset, and Point back into Basic.
- **Life**—a machine-language version of a classic computer game.
- **Windows**—full-blown window driver, includes the ability to execute any DOS command from within a program.

Get immediate results from every program!

Best of all, you can enjoy any program in a matter of seconds. Simply load the programs into your Model 4—no time-consuming keyboarding or debugging! Complete, easy-to-follow loading instructions are included on each disk.

Get a winning software package for your Model 4 today. Complete the coupon or attached order card and return with payment. Or, for faster service, call toll-free **1-800-258-5473**. (In NH, dial 1-924-9471.)

Available in April.



YES. I want a winning software package for my Model 4. Send me The Best of the Model 4 today at \$21.45 per disk. (Price includes postage and handling.)

5-86B

Check/MO Visa AE MC

Card #

Exp. Date

Signature

Name

Address

City

State

Zip

* Model 4 and Model III are registered trademarks of Radio Shack, a division of Tandy Corporation.

LOAD 80 • 80 PINE ST. • PETERBOROUGH, NH 03458

sance and results in extra system cost.

Finally, signal integrity may be compromised if much electrical noise is present. While there are ways to minimize the possibility of bit loss (for example, cable shielding), the RS-232C is somewhat susceptible to environmental noise.

Introducing the RS-422A

Like the RS-232C, the RS-422A interface was developed by the Electronic Industries Association (EIA). While the RS-232C specifies the 25-pin DB-25 (D-subminiature) connector for the physical interface, the RS-422A doesn't specify an interface connector. Only transmitter, receiver, loading, and cabling specifications are addressed. The RS-422A is, however, designed to be used with the RS-449 EIA standard for physical interconnection. The RS-449 standard describes a 37-pin D-subminiature connector for primary signal connections and a secondary nine-pin D-subminiature connector for secondary connections. I will be treating the RS-422A/RS-449 combination as the RS-422A interface, since this is usually how it is used. When necessary, I will make distinctions between the two standards.

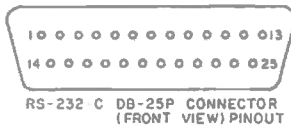
Let's first look at some of the RS-422A's specifications, comparing them to those for the RS-232C.

The RS-422A overcomes the RS-232C's first limitation, distance, by allowing high-speed serial data transfers at distances up to 4,000 feet. The allowed distance is a function of data transfer rate, but the full 4,000 feet (1,200 meters) is permitted for data rates up to 90 Kbps.

The RS-422A interface permits data transfer rates much higher than the RS-232C. The RS-422A's specification is for communication rates of up to 10 Mbps, but the RS-449 physical interface limits the data rate to 2 Mbps (hardly a limitation compared to RS-232C's poky 20 Kbps).

Unlike the RS-232C, the RS-422A requires only a +5V power supply. The designers of the RS-422A standard realized that it would be used primarily in digital systems that use +5V-only logic.

RS-232C PROBLEMS & LIMITATIONS
 50 FEET DISTANCE LIMIT
 20,000 BITS-PER-SECOND SPEED LIMIT
 +/- POWER SUPPLY REQUIRED
 SUSCEPTIBLE TO NOISE



DB-25 PIN #	MNEMONIC	DESCRIPTION
1	AA	PROTECTIVE GROUND
2	BA	TRANSMITTED DATA
3	BB	RECEIVED DATA
4	CA	REQUEST TO SEND
5	CB	CLEAR TO SEND
6	CC	DATA SET READY
7	AB	SIGNAL GROUND
8	CF	RECEIVED LINE SIGNAL DETECTOR
9	-	RESERVED
10	-	RESERVED
11	-	UNASSIGNED
12	SCF	SEC. RECEIVED LINE SIGNAL DETECTOR
13	SCB	SEC. CLEAR TO SEND
14	SBA	SEC. TRANSMITTED DATA
15	DB	TRANSMITTED SIGNAL ELEMENT TIMING (DCE)
16	SBB	SEC RECEIVED DATA
17	DD	RECEIVER SIGNAL ELEMENT TIMING (DCE)
18	-	UNASSIGNED
19	SCA	SEC. REQUEST TO SEND
20	CD	DATA TERMINAL READY
21	CG	SIGNAL QUALITY DETECTOR
22	CE	RING INDICATOR
23	CH/CI	DATA SIGNAL RATE SELECTOR
24	DA	TRANSMITTED SIGNAL ELEMENT TIMING (DTE)
25	-	UNASSIGNED

Figure 1. RS-232C connector pin-out and pin/function breakdown.

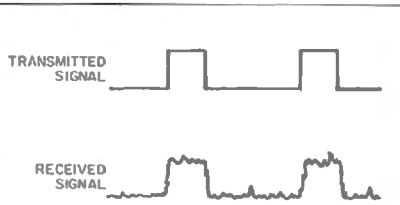


Figure 2. RS-232C signal noise.

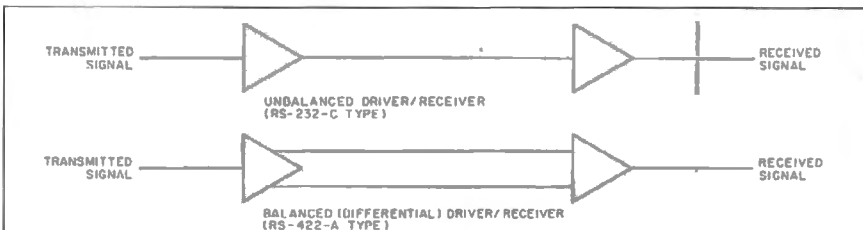


Figure 3. Comparison of unbalanced and balanced signal drivers and receivers.

FOR TRS-80 MODELS 1, 3, 4, 4P
 IBM PC/XT, AT&T 6300, ETC.

THE COMPLETE FORTH GETS A MAJOR UPDATE: MMSFORTH V2.4

- A total software environment: custom drivers for printer, video and keyboard improve speed and flexibility. (New TRS-80 M.4 version, tool)
- Common SYS format gives you a big 395K (195K single-sided) per disk, plus a boot track!
- Common wordset (79-Standard plus MMSFORTH extensions) on all supported computers.
- Common and powerful applications programs available (most with MMSFORTH source code) so you can use them compatibly (with the same data disks) across all supported computers.
- Very fast compile speeds and advanced program development environment.
- A fantastic full-screen Forth Editor: Auto-Find (or -Replace) any word (forward or back), compare or Pairs-Edit any two ranges of blocks, much more.
- Temporary dictionary areas.
- QUANS, VECTS, vectored I/O, and many more of the latest high-performance Forth constructs.
- Manual and demo programs are bigger and better than ever!
- Same thorough support: Users Newsletter, User Groups worldwide, telephone tips. Full consulting services.
- Personal Licensing (one person on one computer) is standard. Corporate Site Licensing and Bulk Distribution Licensing available to professional users.

mmsFORTH

IT'S BETTER THAN EVER.

The total software environment for IBM PC/XT, TRS-80 Model 1, 3, 4 and close friends.

- Personal License (required):
MMSFORTH V2.4 System Disk \$179.95
(TRS-80 Model 1 requires lowercase, DDEN, 140-track drive.)
 - Personal License (additional modules):
FORTHCOM communications module \$ 49.95
UTILITIES 49.95
GAMES 39.95
EXPERT-2 expert system 69.95
DATAHANDLER 59.95
DATAHANDLER-PLUS (PC only, 128K req.) 99.95
FORTHWRITE word processor 99.95
 - Corporate Site License Extensions from \$1,000
 - Bulk Distribution from \$500/50 units.
 - Some recommended Forth books:
STARTING FORTH (programming) 19.95
THINKING FORTH (technique) 15.95
BEGINNING FORTH (re MMSFORTH) 16.95
- Shipping/handling & tax extra. No returns on software. Ask your dealer to show you the world of MMSFORTH, or request our free brochure.

MILLER MICROCOMPUTER SERVICES
 61 Lake Shore Road, Natick, MA 01760
 (617) 653-6136

Back Issues

July 1984: Guide to Disk Operating Systems, GW-Basic, and a Machine-language minimizer.

August 1984: Games issue, Model 4 ED-TASM, dBase II, Scripsit extras, and quality sales reports.

September 1984: Disk drive repair and maintenance and a guide to Error Assemblers.

October 1984: Bar codes, educational programs for teachers and speech synthesis.

November 1984: Special utilities issue, cassette Basic enhancements, and a hybrid text editor.

December 1984: Gift guide, football strategy game, wind chill calculator, and an easy data base manager.

January 1985: Basic compiler, Scripsit enhancements, custom graphics characters, and TRSDOS 1.3 patches.

February 1985: Line and bar graph program, GW-Basic, and easy Assembly-language programming.

March 1985: Tandy's 1200 HD reviewed, fathom disk error messages and salvage flawed disks, and a deluxe graphics editor.

April 1985: Hi-res line and bar graphs, Tandy's 1000, and a Model 4 disk zap utility.

May 1985: Tandy's DeskMate reviewed, combat simulator, guide to surge protectors, and restricted input entry program.

June 1985: Tandy 1000 tips and hints, added strength for your DOS, more workspace with SuperScripsit, and Critical Path Scheduling.

July 1985: BBS directory, display up to 16 help screens, create custom sorts, and a type-ahead feature for Model III.

August 1985: Model 4 and GW-Basics, swap between two programs running on 128K Model 4, and more patches for TRSDOS 1.3.

In each back issue, you'll also find our regular features, reviews of popular software and hardware, and dozens of useful programs that are yours for the typing.

Each back issue costs \$4.50 plus \$1 shipping and handling. On orders of 10 or more back issues, there is a flat \$7.50 shipping and handling fee. Quantities are limited. Send your orders to 80 Micro, Attn: Back-Issue Orders, 80 Pine St., Peterborough, NH 03458.

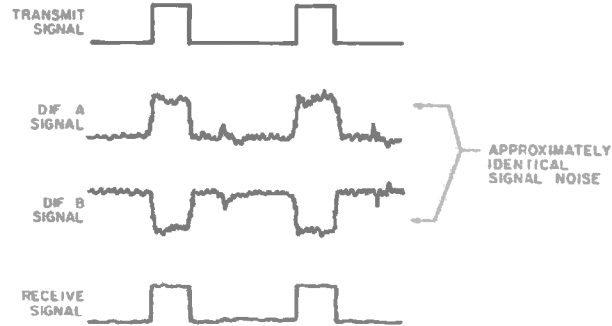
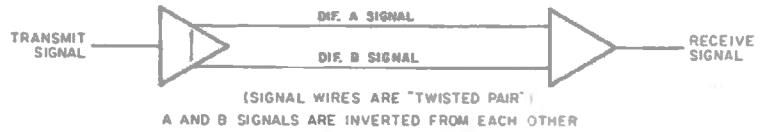


Figure 4. Noise cancellation effect of the differential transmit/receive circuit.

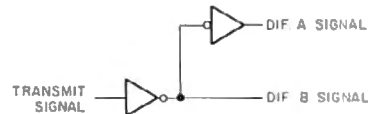
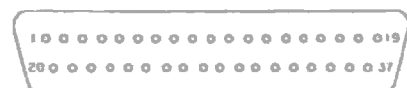


Figure 5. Conceptual operation of the differential transmitter.

SIGNAL	1st DIF. SIGNAL PIN	2nd DIF. SIGNAL PIN
SHIELD	1	
SD	4	27
ST	5	23
RD	6	24
RS	7	25
RT	8	26
CS	9	27
DM	11	29
TR	12	30
RR	13	3
TT	17	35
SG	19	

SIGNAL NAMES

- SD SEND DATA
- ST SEND TIMING
- RD RECEIVE DATA
- RS REQUEST TO SEND
- RT RECEIVE TIMING
- CS CLEAR TO SEND
- DM DATA MODE
- TR TERMINAL READY
- RR RECEIVER READY
- TT TERMINAL TIMING
- SG SIGNAL GROUND

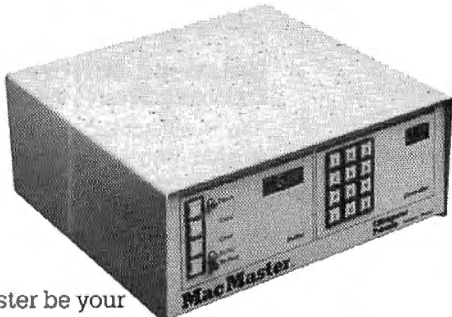


D9-37P CONNECTOR PINOUT (FRONT VIEW)

Figure 6. RS-422A signals and connector pinout.

Computer Friends Buffers, the new generation.

MAC MASTER™ Universal Buffer & Printer Controller.



LOOK!

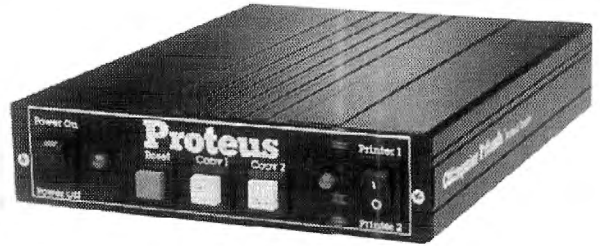
Let Mac Master be your

1. Buffer and free your Computer Memory
2. Printer Controller. Mac Master stores/recalls all the fonts and commands of any printer you connect to it.
3. Auxiliary Memory. Mac Master stores/recalls files, logos, graphic symbols, etc.

Plus multiple copy capability, memory and copy no. display, pause and bypass option, and more. Available in parallel or serial.

64K **\$299⁰⁰** — 256K **\$450⁰⁰**
 1 MEG **\$700⁰⁰** Shipping **\$4⁰⁰ U.S.**

PROTEUS™ Double Buffer & Data Switch (Parallel).



Connect 2 printers or other parallel peripherals to PROTEUS and you will have:

1. Buffer on Port 1 and 2.
2. Switching capability (manual or via software).
3. Multiple Copy capability on both ports.

PROTEUS 64K — **\$199⁰⁰**

Shipping
\$4⁰⁰ U.S.

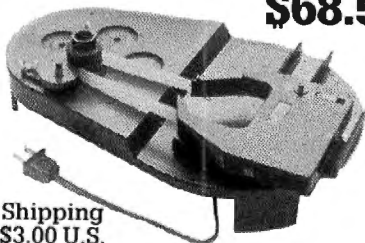
PROTEUS 256K — **\$299⁰⁰**

Mac Master and/or Proteus are easily installed and can be used immediately. 12 Months Warranty.

UNIVERSAL MAC INKER™ Re-ink your Fabric Ribbons automatically for less than 5 cents.

Extremely simple operation. We support any fabric cartridge including all TRS-80s. The **Universal Cartridge MAC INKER** is \$68.50. The **Universal Spool MAC INKER** is \$66.95. Our lubricated, dot matrix ink (\$3.00/bottle) yields a darker print than most new ribbons. Estimated no. of re-inkings per ave. cartridge 60-100. MAC INKER has been reviewed, approved and flattered in most magazines, even in the New York Times and the Chicago Sun Times.

\$68.50



Shipping
\$3.00 U.S.

(Universal w/C. Itoh Prowriter Cartridge).
Over 50,000 MAC INKERS in the field as of Jan. 15, 1986.

RE-INK IN COLOR TOO

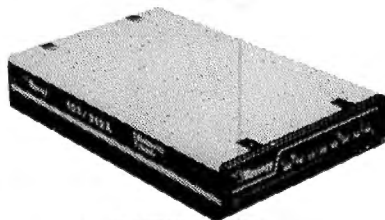
We have colored or un-inked cartridges or reloads for all the TRS 80 and for all other popular printers. Colors: Brown, Blue, Red, Green, Yellow, Purple. Please inquire.

MERCURY MODEM

Really 100% Hayes* Smartmodem Compatible. ■ 300/1200 Baud Speed. ■ Auto answer, Auto dial, Auto speed selection. ■ Audio monitor w/Volume Control. ■ Front Panel lights. ■ Excellent Manual. ■ 18 months warranty.

\$205⁰⁰

Includes power supply and telephone cable. Computer to Modem cable \$15.00. Shipping \$4.00

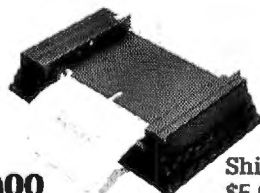


*Hayes is a trademark of Hayes Microproducts

mac-the-ripper™

Perforation Eliminating Machine.

Tears off the perforations from computer papers. Feed in the first sheet of the stack and let mac-the-ripper do the rest. Eliminates tedium and can pay for itself promptly in saved personnel time.



\$49⁰⁰

Shipping
\$5.00 U.S.

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 Par. or Ser.

\$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



Figure 7. Typical application of RS-232C/RS-422A converter boards.

Last, but certainly not least, the RS-422A has a high immunity to noise, providing more reliable data transfer. This is accomplished by the use of "balanced differential drivers and receivers" (described below), which also makes possible the 422A's +5V power supply and greater communication distances.

Balanced Differential Drivers/Receivers

In the RS-232C, all signals (transmit, receive, and so on) are referenced to a common signal ground (pin 7). A certain amount of noise is inevitably induced in the signal lines: the ground line itself is often the noisiest because it handles the greatest current load. Noise in signal lines produced by surrounding magnetic interference is known as common mode noise. Since the signals and the ground line contain common mode noise, the integrity of the received signal value is sometimes questionable. The problem is compounded with longer cable runs and higher data rates. Figure 2 illustrates typical noise effects of the RS-232C's unbalanced approach to signal transmission.

Noise problems can be greatly reduced by using balanced or differential circuits for transmitting and receiving signals. Figure 3 shows a graphic comparison of unbalanced and balanced drivers and receivers. As you can see, the balanced circuit uses two lines for transmitting and receiving, while the unbalanced circuit uses only one.

There is a dual advantage to using balanced circuits. The first is the ability to use twisted pair wires (a pair of wires twisted together) for each signal. For reasons beyond the scope of this discussion, signals traveling on twisted pair wires have much greater noise immunity than those traveling on single wires (one of the two wires of the pair is generally the signal reference). The twisted pair approach provides some immunity to induced noise.

The second and primary advantage to the balanced circuit involves its compensation for common mode noise. Since twisted pair wires are closely coupled within a cable, the common mode noise induced in one wire of a pair is likely to be the same as that induced in the other. The differential receiver merely looks at the difference between the two received signals. Since their noise voltages are nearly identical, this effectively cancels the noise. Residual noise might remain, but it is usually quite small. Figure 4 illustrates the concept of the differential receiver noise cancellation.

In any long-distance signal transmission, better data integrity can be achieved with higher transmission volt-

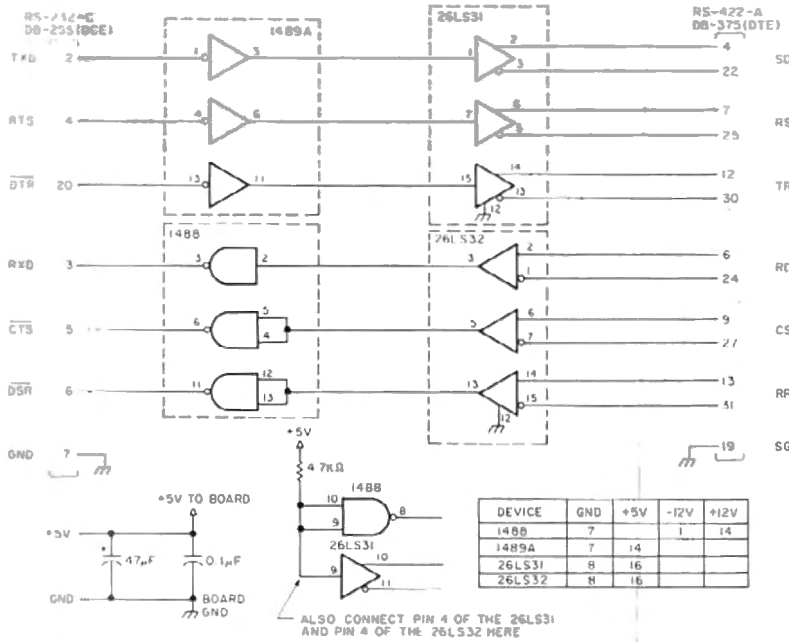


Figure 8. Schematic of the RS-232C/RS-422A converter board.

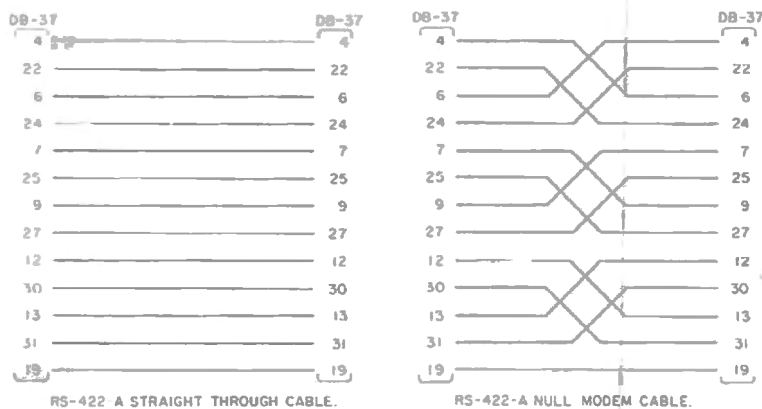


Figure 9. RS-232C straight-through and null-modem cable arrangements.

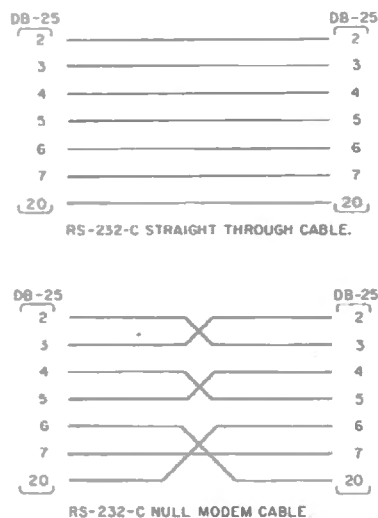


Figure 10. RS-422A straight-through and null-modem cable arrangements.

ages. This is why the RS-232C generally uses $\pm 12V$ instead of $\pm 5V$. Since the RS-422A uses only a single $+5V$ supply, you might think it would have a distance problem. But the potential problem is overcome in a clever way.

Figure 5 shows the operation of the differential transmitter. There are effectively two outputs that are always (except at transition time) in opposite states. When the output is a logical high, for example, one output will be on ($+5V$) while the other will be off (ground level); for a logical low, the outputs change to the opposite states. This gives the balanced output an effective 10-volt swing, even though a single $+5V$ supply drives the signals.

RS-422A Connector Pinout

The RS-422A electrical interface standard is of little practical use without a standard physical interconnection method. The pinout and signal names of the RS-244A/RS-449 interface is shown in Fig. 6. To avoid confusion, the developers of the RS-449 interface used signal names that were associated with, but not identical to, those used in the RS-232C. Many of the signals correspond directly, while certain RS-232C signals were eliminated and a few others added.

The RS-232C/RS-422A Converter Board

While the RS-422A is far superior to the RS-232C, it will not quickly challenge the RS-232C's dominance. Because of the functional similarity between the two interfaces' most common signals, it

is fairly easy to make a board that converts between them. This allows an RS-232C interface, for example, to communicate at distances of up to 4,000 feet to another remote RS-232C- or RS-422A-based communications device (Fig. 7).

Both the RS-232C and RS-422A standards refer to two different communications devices: DTE and DCE. In both, DTE is an abbreviation for data terminal equipment. With the RS-232C, however, DCE is data communication equipment; whereas with the RS-422A, it is data circuit-terminating equipment. I haven't yet found what the difference really is.

Figure 8 shows the schematic for the RS-232C/RS-422A conversion board. The Table lists the parts you'll need. The converter board has a DCE-configured RS-232C interface (to connect directly with a DTE-configured RS-232C device) and a DTE-configured RS-422A interface (to connect directly with a DCE-configured device). Of course, you can use null-modem adapter cables to connect DCE-DCE or DTE-DTE together. Figures 9 and 10 show the null-modem and straight-through cables for the two interfaces. Remember, only the most common signals are used in this project; many more are available for specific applications.

Building It Right

Construction of the board is straightforward from the schematic. Fortunately, the interface is simplified by the use of specialized interface chips designed for RS-422A and RS-232C interfacing. The interface requires $+5V$ as well as $\pm 12V$ for power to support the RS-232C. Current requirements for the supplies are fairly minimal. The $+5V$ supply should not require more than 100 mA, while 50 mA each for the $\pm 12V$ supplies should be sufficient.

Operation of the Board

Operating the board is simply a matter of powering the board and plugging in the cables. If you are going to use the board as an "RS-232C extension cord" (see Fig. 7) you will need two boards and a null-modem cable between the two. Otherwise, use whichever cable is appropriate for the device to which you are interfacing. If it is a DCE (RS-422A) device, use a straight-through cable (Fig. 9); if it is another DTE device, use the null-modem cable (Fig. 10).

Be careful when wiring the cable. An RS-422A signal is effectively inverted merely by swapping the two outputs of the balanced driver, so take care to avoid this (although this feature is actually handy in some instances). Incidentally, you don't need twisted pair for the RS-422A cabling, though I recommend it.

Conclusion

Although I'm sure it will be some time before RS-422A invades the RS-232C's stronghold, its superiority is not to be overlooked. This standard is currently being adopted in industry and will eventually appear in the consumer marketplace. You now have a head start on what is to come. ■

Write to Roger C. Alford at P.O. Box 2014, Ann Arbor, MI 48106. Please enclose a self-addressed, stamped envelope for a reply.

References

- EIA Standard RS-232C (\$13) Electronic Industries Association, Engineering Department, 2001 Eye St., NW, Washington, DC 20006.
- EIA Standard RS-422A (\$14) (same address as above)
- EIA Standard RS-449 (\$19) (same address as above)
- EIA Standard RS-499 Addendum #5) (same address as above)

Foreign Dealers

You have a large technical audience that speaks English and is in need of the kind of microcomputer information that **CW Communications/Peterborough** provides.

Provide your audience with the magazines they need and make money at the same time. For details on selling **80 Micro**, **InCider**, **HOT CoCo**, and **RUN** contact:

SANDRA JOSEPH WORLD WIDE MEDIA
386 PARK AVE. SOUTH
NEW YORK, N.Y. 10016
PHONE-(212) 686-1520 TELEX-620430

\$499

NEW!



5 MEG HARD DRIVE

**Comes complete with cable
and choice of software driver***
(CPM, LDOS, TRSDOS)

	Primary	Secondary
5 Megabyte	499	399
10 "	699	599
15 "	799	699
20 "	899	799
30 "	999	899

There are firms which offer benefits, experience or products seemingly too good to be true. Now why would you want to expose yourself to unhappiness when Aerocomp has a proven record of thousands of happy, satisfied TRS-80 customers. Just take a minute to look through back issues of this magazine. You won't find many companies that have been around as long as Aerocomp. We fully support TRS-80 computers and most all operating systems including CP/M 2.2. Aerocomp leads the way to low hard disk prices so you can afford to enjoy the benefits of increased storage and faster disk I/O. These units are precision engineered, tested and delivered complete and ready to use, right from our stock. Each unit is guaranteed for one year parts and labor. You can count on us to be here if you should ever need us. As always, your satisfaction is assured with our 14 day free trial offer. If, for some reason, you are dissatisfied with our drive merely return it for a full refund (less shipping). How can you go wrong? Specify the software driver of your choice and start enjoying your computer's real capability. Do it today! Call our toll-free number now!

SYSTEM FEATURES

- For TRS-80 Model 3-4-4P
- One Year Parts & Labor Warranty
- Size Rated After Format
- Continuous Duty Power Supply
- Error Checking & Correcting
- Continuous Duty Fan
- Size 11.5" x 12.5" x 5.0"
- All Contacts Gold Plated

*Model 3 requires LDOS

Model 4 requires TRSDOS 6.2 or Montezuma Micro CP/M 2.2

See opposite page ▶▶▶▶▶▶

MODEL I DOUBLE DENSITY BOARD

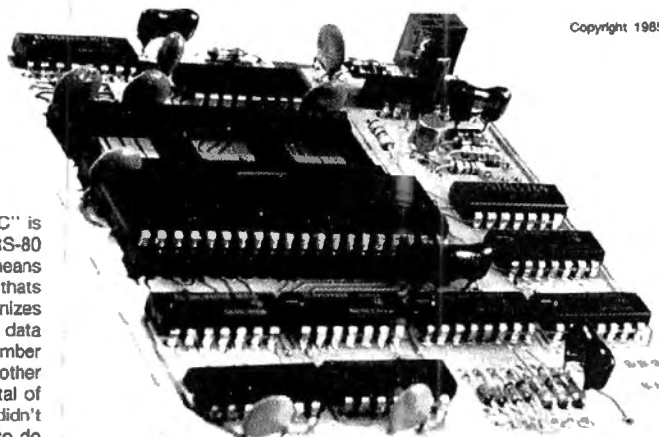
Add 80% more capacity to your disk system with the Double Density Controller (DDC) from Aerocomp.

The Story

Some products have what it takes to seem to last forever. Our "DDC" is one of those products. What it does is allow you to operate your TRS-80 Model 1 disk system in double density. In this case double density means almost doubling the storage capacity of your diskettes. Single density, that's the way Radio Shack designed your Model I expansion interface, organizes your disk into 10 sectors per track. Each sector contains 256 bytes of data for a total storage capacity 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, writes 18 sectors per track each containing 256 bytes for a total of 4,608 bytes or 4.5K. That is 80% more data in the same space. Why didn't Radio Shack do that in the beginning, you ask? Well it costs money to do double density because it is more difficult to do than single density and the data is harder to capture reliably. That means more cost and the Model I was meant to be a low-cost computer for the masses. Therefore, no double density for the original Model I.

The Facts

Other companies introduced double density controllers for the Model I but they were not so good. We waited and waited but, even new models failed to correct problems with data separation that kept cropping up. So we went to work and came up with a new design to cure the old problem. At last! A double density controller for the Model I with a higher probability of data recovery than with any other double density controller on the market then or since. Our analog design phase lock loop data separator has a wider capture window than the digital types the others use. This allows high resolution data centering. Our "DDC" analog circuit allows infinitely variable tuning. The attack and settling times are optimum for 5.25" diskettes. 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 here is state-of-the-art performance and reliability.



Copyright 1985

ORDER YOURS TODAY

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 data separation 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. All the popular DOS's (except TRSDOS) have the drivers. We have put together two special packages in the event you don't already have one of the more popular DOS's.

Please add \$4 handling & shipping

"DDC" by itself \$ 99

"DDC" and LDOS 159

"DDC" and NEWDOS 80 2.0 179

- ☑ 40 Track
- ☑ 80 Track
- ☑ Single Head
- ☑ Dual Head
- ☑ Bare
- ☑ Complete
- ☑ Full Size
- ☑ Half Size
- ☑ 3-1/2", 5-1/4" or 8"

DISK DRIVES

Aerocomp leads the way to the BEST value in disk drives and related peripheral products on the market today. 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 offerings and make your selection. When you have made your choice call our toll-free number and place your order. If you need assistance in making your selection, please call our information number. It's listed in the box at the bottom of this ad along with the technical assistance number for those of you who want to get right to the nitty-gritty. Thanks, we all appreciate your business and will continue to do our very best to support you.

BARE DRIVES Add \$4 S&H

These drives are completely burned-in and tested for your ultimate satisfaction. Add that extra drive today! These are new factory drives. No blams, seconds, closeouts or defunct manufacturers surplus (MPI, Shugart, etc). Instruction manual included at no extra cost. Service manuals are also available. See "Miscellaneous Goodies" for information.

40tk SS half high TEAC FD35-A	\$ 99
40tk DS half high TEAC FD35-B	109
80tk DS half high TEAC FD35-F	129
40tk SS full size Tandon TM100-1	119
40tk DS full size Tandon TM100-2	119
40tk SS half high TEAC FD55-A	89
40tk DS half high TEAC FD55-B	99
80tk DS half high TEAC FD55-F	119
8" SS Thinline Tandon TM848-1E	260
8" DS Thinline Tandon TM848-2E	335

8" FLOPPY DRIVES Add \$12 S&H

These 8" Thinline drives work with the Model 2 and 16 plus others that use standard drives. The rugged all-steel cabinet has an extra heavy duty power supply rated for continuous operation. A removable air filter allows only clean air to circulate. Cabinets with single drives are supplied with a blank panel to cover the unused space. A second drive can be added at any time. Service manuals are available. See "Miscellaneous Goodies" for info.

1-8" SS Tandon TM848-1E & case	\$ 389
2-8" SS Tandon TM848-1E's & case	649
1-8" DS Tandon TM848-1E & case	439
2-8" DS Tandon TM848-2E's & case	699

MISCELLANEOUS GOODIES \$2 S&H

Model 1 TRSDOS 2.3 disk & manual	\$ 25
Model 3 TRSDOS 1.3 disk & manual	25
Model 4 TRSDOS 6.2.x disk & manual	20
LDOS (specify Model I or III)	69
NEWDOS 80 v2.0 (specify Model I or III)	99
Montezuma Micro Model 4 CP/M 2.2	169
Tandon TM100-1/2 Service Manual	20
Tandon TM848-1/2 Service Manual	20
TEAC FD55A/B/F Service Manual	20
10 SSDD disks in library box, Lifetime Guar	12
10 DSDD disks in library box, Lifetime Guar	15
5.25" drive power supply & enclosure	59
8" drive pwr sply & encl w/fan 5V-24V	150
5.25" 1-drive cable, a nice length	19
5.25" 2-drive cable, a 44 inch	24
5.25" 3-drive cable, just the right size	29
5.25" 4-drive cable, the top dog	34
5.25" Extender cable with gold contacts	10

COMPLETE DRIVES Add \$6 S&H

Fits TRS-80 Models 1,3,4 and the Color Computer plus the others that use standard drives. The drive of your choice is mounted in a sturdy, all-steel cabinet. An external gold plated drive connector allows cabling without disassembly of the cabinet. Half-high drives come in a full-size cabinet that will hold and power our half-high drives. Single drives have a panel covering the unused space allowing a second drive to be added at any time. All are shipped fully assembled ready to use. Specify silver or beige cover. Stainless Steel covers are available for \$12 additional.

1-40tk DS 3.5" FD-35B in dual case	\$ 159
2-40tk DS 3.5" FD-35B's in dual case	259
1-80tk DS 3.5" FD-35F in dual case	179
2-80tk DS 3.5" FD-35F's in dual case	289
40tk Single Side full size TM100-1	149
40tk Double Side full size TM100-2	159

1-40tk SS half-high FD-55A in dual case	129
2-40tk SS half-high FD-55A's in dual case	219
1-40tk DS half-high FD-55B in dual case	139
2-40tk DS half-high FD-55B's in dual case	259
1-80tk DS half-high FD-55F in dual case	159
2-80tk DS half-high FD-55F's in dual case	279

FREE TRIAL OFFER

Use your Aerocomp hardware product for up to 14 days. If you are not satisfied for ANY REASON (except misuse, damage or improper handling), return it (insured) in the original shipping container for a full purchase price refund, less shipping. Sorry, this offer does not apply to software. Defective software will be replaced. Any hardware/software specials will be prorated and the software will be charged at the regular unbundled price. We have confidence in our products and we know you will be satisfied.

WARRANTY

We offer a one year warranty on parts and labor against defects in materials and workmanship. In the event service becomes necessary for any reason you will find our service department fast, friendly and cooperative. We want to keep you happy. Out of warranty repairs are also available.

100% BURN-IN AND TEST

All our products are burned-in and fully tested prior to shipment. We want you to receive an item ready-to-go. AEROCOMP means reliability!

ORDER NOW!

Call our toll-free number service and place your order. Have your American Express, Mastercard or Visa number ready. We will not charge your card until the day we ship your order. You may order by mail using your credit card, check or money order. Personal and company checks are welcome and cause no shipping delay as long as they are bank printed and the signature exactly agrees with the name printed on the check. We will ship surface COD with no deposit but all COD's require cash or a cashier's check on delivery. Texas residents add 6% State Sales Tax. No tax collected on out of state shipments. Canadian addresses add \$20 to your order if over \$550 for customs documentation.

TRS-80 Model III & 4 DISK CONTROLLER and DRIVE KITS

Convert your cassette Model III or 4 to disk operation with one of our complete kits. You receive our own advanced disk controller board with gold plated edge contacts capable of 4-drive operation; our own power supply; plated steel mounting towers complete with RF1 shield plus all the cables and hardware necessary. Detailed instructions are included. All you need is a screwdriver and a pair of pliers. System kits come with 40 track single-side drives or just order the basic kit and pick the drives you want from the selection in the next column.

CONTROLLER KIT	\$ 199
(Everything you need - less drives and DOS)	
1 DRIVE SYSTEM	299
2 DRIVE SYSTEM	399
Substitute DS drives for only \$10 each.	
Add \$9 shipping & handling	
Model 3 TRSDOS 1.3 disk/manual	25
Model 4 TRSDOS 6.2.x disk/manual	20
LDOS 5.1.4 disk/manual	69
NEWDOS 80 version 2.0 disk/manual	99
CP/M 2.2 by Montezuma Micro	169
No S & H charge when ordered with kit	
MOUNTING KIT AND POWER SUPPLY ONLY	95
Add \$8 shipping and handling	
DISK CONTROLLER ONLY	110
RS-232 BOARD & KIT	69
Add \$4 shipping and handling	

OUR FAMOUS MODEL I STARTER PACKAGE

If you have a Model I and an Expansion Interface this is what you need to get started with disks. Included is one 40 track single-side disk drive complete with matching silver case and power supply, a 2-drive cable, a TRSDOS 2.3 disk operating system and TRSDOS manual plus all insurance and delivery charges to your door (lower 48 states).

Yours for only **\$ 199**

LDOS 5.1.4 disk/manual	69
NEWDOS 80 version 2.0 disk/manual	99

You can add our renowned "DDC" double density controller to either the Radio Shack or the LNW Expansion Interface for 80% more storage capacity on your drive. Order it at the same time as our starter package above and we'll pay the shipping. Go ahead, you deserve increased density. See the opposite page for the latest technical details.

\$ 89

When purchased with Starter Package

CALL TOLL-FREE
800-527-3582 USA
800-442-1310 TEXAS

For inquiries or information
call 214-339-8324

AEROCOMP
Redbird Airport, Bldg. 8
P.O. Box 24829
Dallas, TX 75224

The 1000's New Basic: (Almost) Picture Perfect

The more I use the Model 1000's new Basic, the better I like it. The graphics in version 1.01.00 (Tandy's new version of GW-Basic 2.02) are faster than those in version 00.05, and Tandy has delivered some long-promised capabilities, such as filing and video paging. (I think Tandy felt the old version was incomplete and therefore numbered it 00.05.) As you might expect, the improvements come with a few bugs; later on, I'll give you a patch for one (sound on the 1000A).

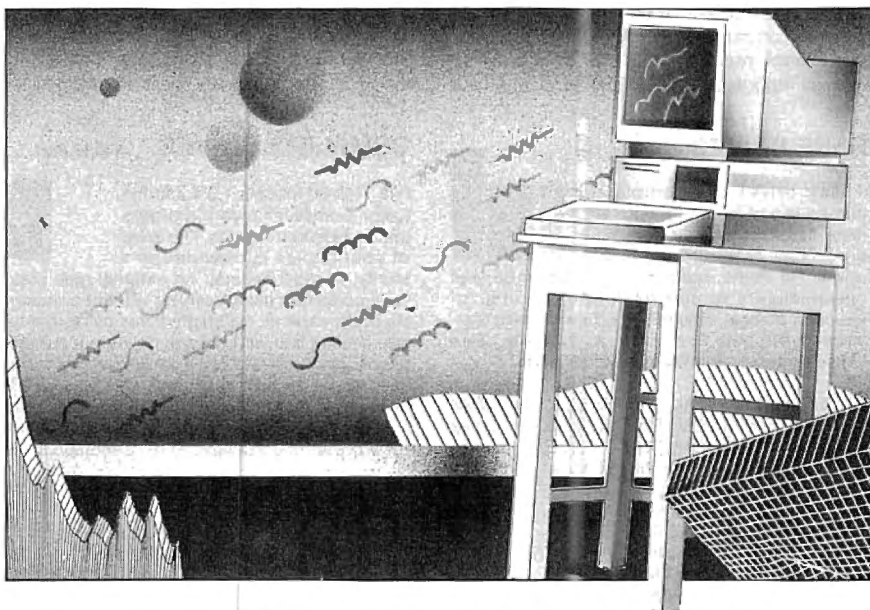
Rather than trust my subjective impressions of the new Basic's speed, I wrote a benchmark test (Program Listing 1). In most cases, I adjusted the For...Next loop so that each test runs about 10 seconds. I tested an empty For...Next loop (lines 100 and 110) to be sure that speed differences were not caused by the loop itself. A subroutine (lines 70 and 80) uses the Timer function as a stopwatch. I chose parameters so that the graphics commands would stay on screen even in mode 3, the lowest resolution mode (160 by 200 pixels).

The program requires a printer (for the results) and 256K of RAM. If you have a 128K 1000, you must forgo modes 5 and 6 and eliminate the Clear statement from line 20. You'll also have to reduce the screen area acted on by Get and Put and the size of the corresponding array A dimensioned in line 1000.

I tested all six graphics modes with both versions of 1000 Basic. As speed differences between modes are slight, and the differences between Basic versions are consistent within a given mode, I averaged the results of the six modes (see the Table). The time for five iterations of a filled circle varied quite a bit, but not in correlation with screen mode. Times for the Get and Put functions varied among modes somewhat, with graphics mode 6 taking four to five seconds longer than the average.

System Requirements

Model 1000



Though the new Basic ran faster in most tests, the differences were minimal in most cases and probably not statistically significant considering the small number of test runs. Get and Put ran faster by several seconds (for five iterations). The big difference was a hundred-fold increase in the speed with which new Basic fills (or clears) a rectangular space, whether it's a filled rectangle created with the Linc command, the whole graphics screen, or a defined graphics viewport. New Basic creates a filled rec-

tangle faster than an unfilled one. This large speed increase makes the other graphics commands seem faster.

Lost Oomph

Two graphics functions did lose some oomph with the revised 1000 Basic. Switching color palettes is now so slow that the Palette and Palette Using statements are useless for creating pseudo-animation. Changing graphics pages is also slower, but still plenty fast. Now that paging appears to work as it should,

Function	Iterations	Ver. 00.05 (sec)	Ver. 1.01 (sec)
For...Next loop	(1000x)	1.39	1.47
PSET/PRESet	(1000x)	7.41	7.04
Line	(60x)	10.07	9.91
Rectangle (Line)	(20x)	11.48	11.26
Rectangle filled	(50x)	1153.52	12.03
Circle	(20x)	10.86	10.60
Circle painted	(5x)	21.72	20.83
Colored viewport cleared	(5x)	230.86	2.68
Draw	(30x)	4.53	4.51
Get and Put	(5x)	30.23	28.60

Table. Results of graphics speed test, averaged for the six graphics modes.

you can create text help screens on the extra screen pages and quickly switch back and forth between the help screens and the current text page.

Tandy implemented the Paint command's tiling option in version 1.01.00, which means you can fill an area with a pattern rather than a solid color. Program Listing 2 is an example of how this option works. Be aware that the syntax for the Paint command shown in the 1000 Basic manual is incorrect: You must put a comma before the color parameter or you'll get a syntax error.

Another pleasant surprise is that graphics screen modes now treat the 25th line as part of the graphics window. You no longer have to clear it in a separate operation. If you execute CLS, any graphics on the 25th line disappear. If the function key display is on, Basic refreshes the function key assignments and clears only the graphics that have overwritten them. This is how it should work.

The new Basic doesn't use the DOS cursor. Let's hope they fixed the disappearing cursor problem that popped up sporadically in the old Basic. If you don't like the thin, double-blinking cursor provided for text mode, you can change it to a full-size cursor using the Locate command:

```
Locate ...0,7
```

The fourth parameter (zero) defines the top of the cursor, and the last parameter (7) defines the bottom. From zero to seven is as large as you can make it. The first three parameters (row, column, visible) will remain as they are if you don't specify them.

Sounding Off

Tandy lists three-voice sound and music on an external speaker among the new Basic's enhancements. You still can't harmonize on the internal speaker, however, and you may not be able to run the external speakers without the internal one going, as the Basic manual indicates. Music buffs should be aware that the 1000's Sound function plays an octave higher than the manual states.

A known hardware bug plagues the Sound and Beep statements on the 1000A (stock number 25-1000A, the one with the 8087 socket). Beep On and Sound On actually disable internal and external speakers, respectively. The off parameter turns them on, naturally. You must execute a Beep Off (or Sound Off) from command mode to get sound. You can't do it from within a program.

Tom Sirianni (Hillsboro, OR) sent in the patch for this bug, which he obtained from his local Tandy Computer Center. You must use Debug to make a small change in Basic.EXE. Use a backup copy

Program Listing 1. Graphics benchmark program for the Tandy 1000's GW-Basic.

```
20 CLEAR ,,32768:KEY OFF:CLS:INPUT "Basic version";VER$
30 INPUT "Graphics mode (1-6)";MODE:IF MODE<1 OR MODE>6 THEN 30
40 SCREEN MODE:LPRINT:LPRINT
50 LPRINT "**Benchmark program for Tandy 1000 GW-Basic Graphics**"
60 LPRINT "Version ";VER$;" Screen Mode";MODE:GOTO 100
70 LPRINT TEST$,TIMER-START;" sec" 'Timer subroutine
80 CLS:START=TIMER:RETURN
100 GOSUB 80:TEST$="FOR-NEXT Loop" '1000 Times
110 FOR I=1 TO 1000:NEXT I:GOSUB 70
200 TEST$="PSET/PRESET" '1000 Times
210 FOR I=1 TO 1000:PSET (10,10),1:PRESET (10,10):NEXT I:GOSUB 70
300 TEST$="Drawing line with LINE" '60 Times
310 FOR I=1 TO 60:LINE (0,0)-(159,199),1:NEXT I:GOSUB 70
400 TEST$="Rectangle with LINE" '20 TIMES
410 FOR I=1 TO 20:LINE (0,0)-(159,199),1,B:NEXT I:GOSUB 70
500 TEST$="Filled Rectangle with LINE" '50 TIMES
510 FOR I=1 TO 50:LINE (0,0)-(159,199),1,BF:NEXT I:GOSUB 70
600 TEST$="Circle" '20 Times
610 FOR I=1 TO 20:CIRCLE (79,99),79,1:NEXT I:GOSUB 70
700 TEST$="Circle filled with Paint" '5 Times
710 FOR I=1 TO 5:CIRCLE (79,99),79,1:PAINT (79,99),0:NEXT I
800 GOSUB 70:TEST$="Clearing colored viewport" '5 Times
810 FOR I=1 TO 5:VIEW (0,0)-(159,199),1:CLS:NEXT I:GOSUB 70
900 TEST$="Drawing with DRAW" '30 Times
910 DS="E10D20E20D20H20R20G20R20H9";FOR I=1 TO 30:DRAW DS:NEXT I:GOSUB 70
1000 TEST$="GETting and PUTting, even";DEFINT A:DIM A(8002) '5 Times
1010 FOR I=1 TO 5:GET (0,0)-(159,199),A:PUT (0,0),A,PRESET:NEXT I:GOSUB 70
```

End

of your DOS system disk, which should have Basic and Debug on it. Here's how it's done:

1. Change the name of Basic.EXE to Basic.TMP (a temporary name; Debug refuses to work on EXE files).
2. At the DOS prompt, type in DEBUG BASIC.TMP and press the enter key.
3. At the Debug prompt, type in E 6AA9 74 and press the enter key.
4. Type in a W and then press enter to write the change to disk.
5. Type in a Q and then press enter to quit Debug.
6. Rename Basic.TMP back to Basic.EXE. It's fixed.

Good Timing

The On Timer trapping function with Basic 1.01.00 is accurate. On Timer(20) sends control to a timer subroutine every 20 seconds. With version 00.05 Basic, a value of 20 was equivalent to approximately one second.

Also welcome is the new Basic's ability to LPRINT and LLIST lines longer than 80 characters without choking. Old Basic gives "Out of paper" or "Printer not ready" messages because it doesn't wait long enough for the printer to complete a carriage return after the 80th column.

As I noted last month, the new Basic's On Key mapping is more IBM compatible (an undocumented change). Keys 17-20 are the old definable keys; keys 15-20 are new definable keys. Since last month, I've learned that keys 21 and 22, rather than keys 11 and 12, are reserved for the F11 and F12 function keys.

Speaking of function keys, version 1.01.00 has more useful function key assignments (the ones shown in the manual). Other enhancements include full

support of serial communications, joysticks, and light pens. (I've yet to see a light pen for the 1000.) I'll explore these subjects in a future column.

Purple Bugs

With so many changes and enhancements, the new Basic's bound to contain some bugs. One of the most distressing glitches occurs if you type while Basic is still loading (that's what type-ahead buffers are for). The screen fills with purple snow and the computer hangs up (push the reset button).

Using the command Color 2 (purple again) in screen mode 6 also hangs up the machine. You can type commands, but Basic ignores them. All you can do is reboot.

You can use Color 2 with screen mode 6 in a program, but if you end or break out of the program in that state you'll lose control. According to the customer support folks in Fort Worth, this bug exists only with the old ROM 1.00. (Unless you're getting a third-party hard drive, it's not worth converting to ROM 1.01 at this point.)

New Basic does not allow you to use the Shell command with more than 16K of video memory allocated. If you do, you'll receive an "Internal error" message. However, only screen modes 5 and 6 require more than the default 16K of video RAM.

Fortunately, the other memory values that you set with the Clear command (extra stack and high memory) don't have this undesirable effect. In old Basic, you could specify up to the maximum of 32,768 bytes of video memory and Shell would work.

Program Listing 2. Tiling with the Paint command.

```

10 CLS:KEY OFF:SCREEN 2           'hi-res, black & white
20 FOR I=0 TO 7:AS=AS+CHR$(2*I):NEXT I 'AS=diagonal line pattern
30 BS=CHR$(&HFF)+CHR$(0)+CHR$(0) 'BS=horizontal line pattern
40 LINE (50,30)-(375,75),1,B     'rectangle
50 PAINT (51,31),AS,1            'paint it with AS
60 CIRCLE (250,125),150,1       'overlapping circle
70 PAINT (250,125),BS,1        'paint it with BS
    
```

End

Circle 450 on Reader Service card.

on the 

PORTABLE PRINTER



JUST **\$149.95**
The Perfect Partner For Your Portable Computer

Drop this battery powered printer into your briefcase

next to your portable computer and you have an office on the road. It's just 11 1/4"x4 1/2"x1 3/4" and less than 2.5 pounds. The thermal print mechanism means quiet, reliable, 40 character/sec. printing for two hours on batteries. On-The-Go has full-sized performance: normal sized, enlarged double width, and condensed characters - uses standard 8 1/2" width thermal paper - 5x7 character matrix with true lowercase descenders - shadow printing - underlining Epson MX-80 graphics - industry standard parallel interface. On-The-Go comes complete with 4 "C" batteries, 90 day limited warranty and a roll of paper.

SPECIAL OFFER

Our \$29.95 accessory kit: AC adapter, an 80' roll of paper, and a leatherette carrying case. Available for a limited time for just \$19.95.

SATISFACTION GUARANTEED

If not completely satisfied within 30 days of purchase return it for full refund.

PORTABLE MEMORY EXPANSION

8 K for Model 100, NEC 8201 - \$29
24K for Tandy Model 200 - \$99
96K for Tandy Model 600 - \$249

Send for our **FREE** catalog of portable computer enhancements!

DEALER INQUIRIES INVITED

Please give Visa or Mastercard number and expiration date. Or if you prefer, mail certified check or chargecard authorization for full amount. Include 4% for UPS shipping and insurance. California residents add 6% sales tax.

TOLL FREE
800 LAP-TOPP

CALIFORNIA
805 482-9699



Laptop Systems — Dept. #M 515 Calle San Pablo, Camarillo, CA 93010

As compensation, however, the new Basic doesn't clear the screen upon return from a Shell command. When you execute the command SHELL "DIR" from the old Basic, the screen clears immediately upon return to Basic. You must read quickly.

Advanced Reading

On another topic, I've been reading *MS-DOS Advanced Applications* by David A. Lien and Lewis Rosenfelder (Tandy catalog number 25-1507). An easy course to a thorough understanding of DOS, including use of EDLIN and Debug, the book contains programming gems even for those already comfortable with DOS. Here are a few nuggets I picked out:

- You can act on whole subdirectories with DOS commands without using the *.* wildcard designation for all files. For example, you could copy all the files in a subdirectory named Letter to a backup subdirectory, Letter.BAK (subdirectories can have extensions), with the DOS command:

```
COPY LETTER LETTER.BAK
```

- Likewise, you could delete a subdirectory named BART (from the parent directory) that didn't have any subdirectories of its own by typing in the two lines:

```
DEL BART
RD BART
```

- You can use wildcard symbols with the Rename command to save typing, but only with the new name:

```
REN FEEDBACK.BAS *.ASC
```

This renames Feedback.BAS to Feedback.ASC.

- The command DIR *. lists only the subdirectories in a directory.
- PATH ; cancels any path settings.
- The Tandy 1200 needs ANSI.SYS in the bootup CONFIG.SYS file if the DOS CLS function is to work.

Command Loop

The other day, I wanted to change the file name extension (from TXT to TNK) for a number of ThinkTank files to differentiate them from other text files. Because they were in a subdirectory, I was able to quickly rename them with one command:

```
FOR %F IN (*.TXT) RENAME %F *.TNK
```

This shows that the For loop command used in batch files also works in DOS command mode if you insert only one percent sign before the variable (F in this case).■

You can reach Dave Rowell at 80 Micro, 80 Pine St., Peterborough, NH 03458.

Take off with a Tandy portable and get real computing power wherever you travel.



As a businessperson you can't afford idle time while traveling. That's why you need a Model 100 (\$499), a Tandy 200 (\$799), or our new Tandy 600 (\$1599) portable computer. Each is an important business tool that will keep you on top of business wherever you go.

Traveling companions

The Model 100, a technological first, is perfect for writing letters, memos, reports and other correspondence anywhere, at any time. This lightweight computer was the first to feature five instant-on programs, an 40x8 display and a modem—all built in.

The Tandy 200 represents a true second generation in portable computers. You can do complete spreadsheet analysis and calculations with the popular Multiplan software that's built into the memory. Or use the Tandy 200 as your personal appointment calendar and address-and-phone directory.

The most advanced laptop

Our new Tandy 600 features a 16-bit microprocessor, an 80-character by 16-line liquid-crystal

display, a built-in 3 1/2" disk drive that stores 360K of data and 32K RAM (expandable to 224K).

The Tandy 600 also includes five resident applications—all designed by Microsoft® for the businessperson on the go. With the Tandy 600's larger display and expanded memory, Multiplan can hold more information. Using MS-Word, you'll also have quicker access to documents and more storage capacity with the built-in disk drive. File is an electronic database for names and addresses, expenses, client billing and more. And you can keep a large number of different files on the pocket-size diskettes. With Telecom and the Tandy 600's built-in modem, you're able to keep in touch with your office over phone lines.

Tandy . . . Clearly Superior™

Tandy offers you a choice of three portable computers—one is sure to fit your needs. You can see these amazing portables at your local Radio Shack Computer Center. Come in today!

Available at over 1200
Radio Shack Computer Centers and at
participating Radio Shack stores and dealers.

Radio Shack®
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

Send me a free
Computer Catalog.

Radio Shack, Dept. 86-A-984A
300 One Tandy Center
Fort Worth, TX 76102

Name _____
Address _____
Company _____
City _____
State _____ Zip _____
Phone _____

Circle 75 on Reader Service card.

Prices apply at Radio Shack Computer Centers and participating stores and dealers. Multiplan and MS-Word/TM Microsoft Corp.

Fast Talk

Novation offers the P2400-HC, a half-card addition to their Professional Series modem line. It provides 2,400-baud transmission and uses a half-slot in any IBM PC or compatible computer. Even with added features like MNP (Micro Network Protocol), the P2400-HC uses only the half-slot.

The modem costs \$695 and is available with Mite software. For more information, contact Novation Inc., 20409 Prairie St., Chatsworth, CA 91311, 818-996-5060.

Circle 576 on Reader Service card.

Translating CP/M

CP/EM from The Intelligent Computer Users Group lets you run CP/M 80 programs on your MS-DOS computer without a coprocessor board.

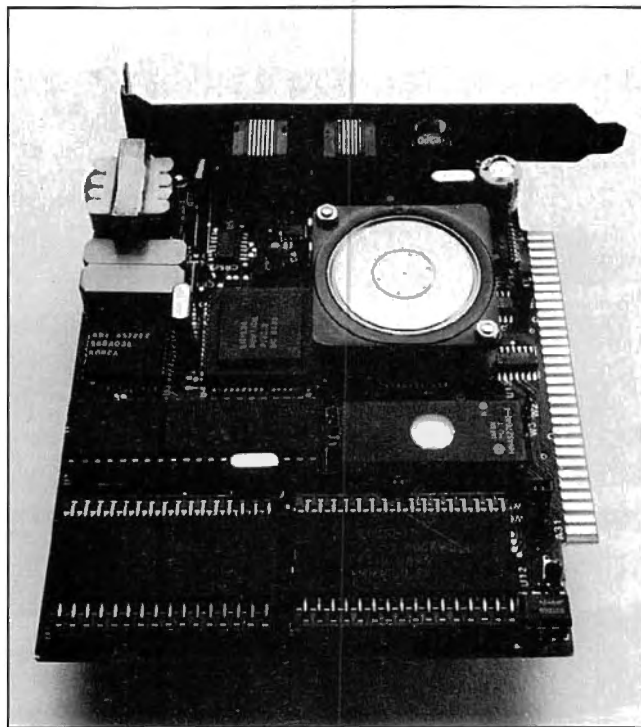
CP/EM emulates the CP/M 8080 and Z80 environments. It uses the standard MS-DOS file system, which allows sharing of data files between CP/M and MS-DOS applications. CP/EM's command interpreter provides all standard commands of the CP/M console command processor.

The program includes serial communications programs to help you transfer programs and data between CP/M and MS-DOS computers. CP/EM runs on MS-DOS 2.0 or higher and costs \$79.95. For further information, contact The ICU Group, P.O. Box 10118, Rochester, NY 14610, 716-425-2519.

Circle 579 on Reader Service card.

Circus Fun

Infocom's new interactive mystery, Ballyhoo, lets you get behind the glittery facade of the circus. You're a small-town circus-goer who learns that the circus owner's daughter has been kidnapped. Getting to the bottom of the crime requires solving puzzles of many kinds. Rather than interviewing potential suspects, you spend much of your time gaining access to places where the child might be hidden.



The P2400-HC, a half-card modem.

The package includes a colorful circus program, a balloon, a trade card for Dr. Nostrum's Herbified Extract, and your ticket to Spangleland. The package runs on MS-DOS computers and costs \$39.95. For more information, contact Infocom Inc., 125 Cambridge Park Drive, Cambridge, MA 02140, 617-492-6000.

Circle 574 on Reader Service card.

Profit Prophet

The Wall Street Prophet (\$199) from ICI provides complete technical analysis of stocks, options, commodities, and any other securities. You enter historical and current daily quotations automatically via Dow Jones News/Retrieval or type them in manually. You can obtain full-color graphics on-screen or printed out, including price-volume, trend-line, option trader's, moving average, and on-balance volume charts.

The Wall Street Prophet provides these technical analysis indicators: high-low price analysis, support and resistance prices, price break-

outs, price volatility, up and down price gaps, positive and negative volume, average volume, and on-balance volume. With the Wall Street Prophet Spreadsheet Interface, you can do your own technical analysis using Lotus 1-2-3 or VisiCalc.

The program runs on the Tandy 1000, 1200, and 3000. It requires 128K and one double-sided disk drive. To use optional features, you might need an asynchronous communications adapter, RS-232C cable, modem, subscription to Dow Jones News/Retrieval, and a dot-matrix printer with graphics capabilities. For more information or a free demonstration copy, contact ICI Inc., P.O. Box 566834, Atlanta, GA 30356, 404-998-1702.

Circle 578 on Reader Service card.

Payroll Call

DAC-Easy Payroll (\$49.95) from DAC Software is a personnel/payroll management system designed to handle any kind of employee payment system. It works as a standalone program or integrates

with DAC-Easy Accounting.

Features include built-in 1986 federal and 50 state tax tables; automatic calculations of FICA, FUTA, and SUTA; and up to seven user-defined deductions per employee. The program allows an unlimited number of employees and tracks hire dates, raises, reviews, vacations, and more.

The program also prints continuous-form checks, W2s, and thousands of different payroll management reports. For more information, contact DAC Software Inc., 4801 Spring Valley Road, Building 110-B, Dallas, TX 75244, 214-458-0038.

Circle 572 on Reader Service card.

Software Selection

Arrays Inc. offers the third edition of *The Book of IBM Software* (\$24.95), a 650-page paperback that grades and reviews over 700 popular software packages for the IBM PC and compatibles.

The book covers business, education, entertainment, and personal/home software, as well as utilities. It rates each program for ease of use, documentation, reliability, and value. In addition, the book's comparison charts help you select the most appropriate software for your needs.

For more information, contact Arrays Inc., 6711 Valjean Ave., Van Nuys, CA 91406, 818-994-1899.

Circle 570 on Reader Service card.

Clear Picture

Personal Computer Products announced NoColor, a program that lets you toggle between color and black-and-white modes on the IBM PC/XT/AT and compatibles with composite monitor. If you have a color graphics board, NoColor's black-and-white mode gives you a clearer, higher-contrast view of full-color displays.

NoColor uses 358 bytes of memory. You can load it from DOS or an AUTOEXEC file.



Food Facts is a nutrition data base from Melissa Data Co.

The program costs \$19.95. Contact Personal Computer Products, 3080 Olcott St., B130, Santa Clara, CA 95054, 408-988-0164. Circle 571 on Reader Service card.

Nibbles

Melissa Data Co. offers Food Facts, a nutrition data base on disk. It gives complete nutritional breakdowns for 4,000 common raw, processed, and prepared foods. Food Facts' data format is readable by the IBM PC and compatibles.

The data base covers 498 categories of food, with up to 216 varieties in each. Its nutrition data was gathered from government agencies, industry, and academic institutions. Files are formatted as comma-delimited, variable-length records, so you can use the data base with Lotus 1-2-3, dBaseII and dBaseIII, and other programs. The program includes Lotus templates.

Food Facts costs \$99. For

more information, contact Melissa Data Co., 12 Balbo Coves, Newport Beach, CA 92663, 714-650-1000. Circle 577 on Reader Service card.

Lifesaver

HELP! is a memory-resident help library for MS-DOS computers. When you need help with a command or key word, you press a key and HELP! displays information about the word. Press another key and your original program's screen is restored.

Help libraries are available for Basic, C, and MS-DOS. The package also includes a set-up utility for customizing the program.

The package costs \$49.95, including HELP!, Setup, a manual, and any one of the libraries. Additional libraries cost \$19.95 each. For more information, contact MicroSmith Computer Technology, P.O. Box 1493, Elkhart, IN 46515, 800-622-4070.

Circle 575 on Reader Service card.

MS-DOS New Products Index

Reader Service Number	Company	Page
570	Arrays Inc.	80
572	DAC Software Inc.	80
578	ICI Inc.	80
579	ICU Group, The	80
574	Infocom Inc.	80
577	Melissa Data Co.	81
575	MicroSmith Computer Technology	81
576	Novation Inc.	80
571	Personal Computer Products	80

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 107 on Reader Service card.

PRONTO

Window Controller and Applications' Manager

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:** Ticker 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 3 x 5 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 3 x 5 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!

PRONTO is also available at Radio Shack via Express Order (90-0353).

Learning GOTO Gracefully

This is the first installment of our newest column, *The Art of Programming*. Editor Eric Maloney introduces Bruce Tonkin in *Side Tracks* on page 12.

Micro users often hear the argument that GOTO commands are bad and should not be used in programming. College instructors admonish students of Pascal and C to avoid the evil command or risk failing. At least one computer language, Modula 2, doesn't have anything equivalent to a GOTO—and Modula 2 is a perfectly usable language.

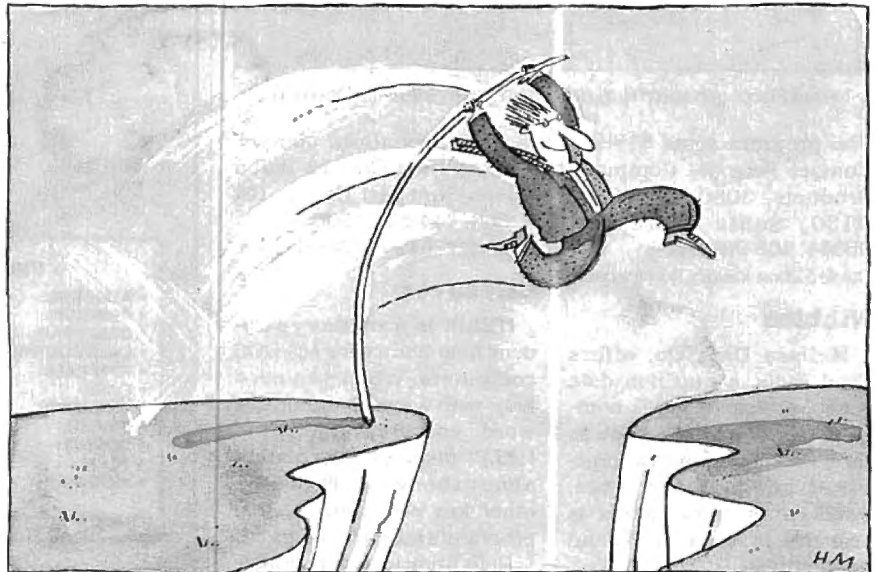
So why not write Basic programs without GOTOs? Wouldn't they be more elegant?

The answer is no, they wouldn't. Basic needs the GOTO command because it doesn't have the fancy control structures of languages like Modula 2, Pascal, and C. On TRS-80 Models I and III, Basic has just two commands for performing a simple loop: For...Next and GOTO. Newer versions of Basic add the While loop, but if you want something fancy, you still need a GOTO.

Just in Case

Instead of GOTOs, structured languages use Case statements, which amount to nothing more than extended If loops. If Basic used Case statements, you would be able to write code that looked like that in Program Listing 1. Without the Case statements, you might write the code like that in Program Listing 2.

Pascal and Modula 2 enthusiasts raise examples like this one to point out the deficiencies of Basic and its use of GOTO commands. To these admirers of elegance and efficiency, Basic is heresy of the worst kind. Because it tests the negative of each selection, the Basic code is more difficult to understand, they argue. And it uses more lines and statements. I have a bad feeling about these argu-



ments, though. Internally, structured languages that use Case statements perform hundreds of GOTOs when they are compiled. When a language processes a Case statement, it must do two things: determine if the Case is valid (is A\$ = "Y"?), and determine where to go if it isn't.

The GOTO is there—the only difference is that the compiler, instead of the programmer, generates it. The Basic programmer must use a few extra key-

strokes to type in the GOTO, but that's his only penalty. He loses no efficiency and no speed. If he compiles the Basic program, it should process the equivalent of the Case statement just as fast as structured languages like Pascal, C, and Modula 2.

The problem is that most programmers don't know how to use the GOTO command correctly. For this reason, designers of highly structured languages have taken the GOTO away from the pro-

Program Listing 1. How Basic code to trap keyboard input might look if you could use the Case statement.

```
100 CASE A$="Y"
110 'HANDLE A$="Y"
120 CASE A$="N"
130 'HANDLE A$="N"
140 CASE ELSE
150 'HANDLE EXCEPTIONS
160 'CONTINUE WITH THE PROGRAM
```

End

Program Listing 2. The same function using If...Then statements.

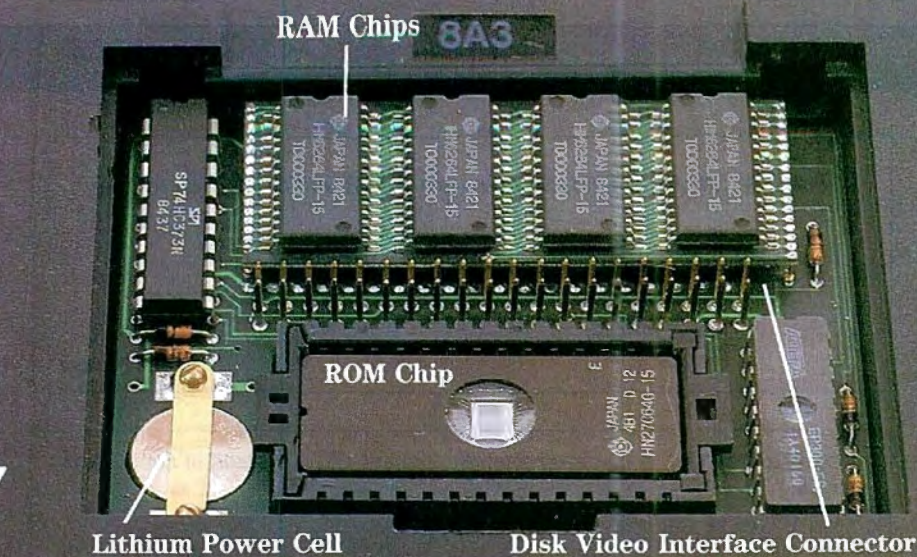
```
100 IF A$<>"Y" THEN 130
110 'HANDLE THE CASE A$="Y"
120 GOTO 170
130 IF A$<>"N" THEN 160
140 'HANDLE THE CASE A$="N"
150 GOTO 170
160 'HANDLE THE CASE WHERE A$<>"N" AND A$<>"Y"
170 'CONTINUE WITH THE PROGRAM
```

End

System Requirements

All computers
Basic

State of The Art RAM Technology



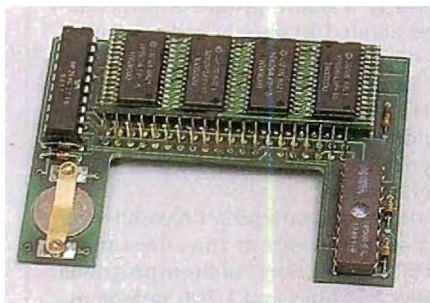
Circle 470 on Reader Service card.

At last, a 96K Model 100!

"The new PG Design RAM should be in every Model 100 built!"

Miniaturized Technology

Our miniaturized RAM chips are state of the art. They are the most advanced memory chips found anywhere in the world. Their tiny size allows us to keep a low profile in the expansion port of the Model 100. We use a technique called *vapor phase soldering* to ensure that each and every tiny connection is clean — perfect.



The RAM module is precision constructed.

Like The Original

Each 32K RAM bank has its own command of the software that comes in your Model 100. BASIC, TEXT, TEL-COM, ADDRSS, SCHEDL are all there in each bank and you can use them as you would in the original bank. Each bank can be accessed from any of the other banks. We even have an optional data transfer program

which allows data to be transferred from one bank to any other bank. It's flawless!

Simple Installation

"Adding this 64K RAM module to your Model 100 is as easy as putting in new batteries." Once you've removed the expansion cover on the back of your Model 100, just snap the PG Design RAM module in. You can't get it wrong! The pins line up perfectly with the expansion holes in the Model 100 compartment. Snap the cover back on and turn your Model 100 over. Turn it on and enter BASIC. Type in the one line program we supply you and presto—you've got a Model 100 with 96K of RAM. You do not need a 32K Model 100 to utilize the PG Design 64K RAM module.

No Need To Remove It

The beauty of this RAM module is that we've enabled you to have a Model 100 with 96K of RAM and we've given you access to the other Model 100 options within the expansion compartment. The DVI connection can be made easily with our rugged connectors. Gone are the flat flimsy pins. And best of all, the ROM slot is clear to insert any ROM modules, (like Tandy's Multiplan on ROM). We designed this RAM module so it wouldn't ever have to be removed from your Model 100. But, if you should remove it, we've installed a lithium

power cell that will keep all the data on the module intact for six months outside the Model 100. Six months! The actual life span of the lithium power cell while in the Model 100 is nearly six years!

Guarantee

We stand behind all the products we manufacture at PG Design. If you are not completely satisfied with your purchase, call us! If we cannot solve your problem, return the product to us and we will refund your money. We are positive that you will be completely satisfied with all our products.

Order Today

64K RAM module — \$375

32K RAM module — \$250

If you want only a 32K version of the RAM module, you may upgrade later for only \$150. The 32K version is constructed exactly as the 64K module.

Data Transfer Program — call

Call us at 313/727-2744, or write. We accept Visa and MasterCard, as well as check or money orders. We ship within five days of receiving your order.

Dealer Prices Available

TRS-80 is a trade mark of Radio Shack

PG Design

Simple Installation!

Model 100

8K RAM Modules—\$29.95 ea. Set of three—\$84.00
(available for NEC 8201A).

Tandy 200

24K RAM Modules—\$109 ea. (\$99 ea. two or more).

PG Design Electronics, Inc. 66040 Gratiot, Richmond, Michigan 48062 (313) 727-2744

Program Listing 3. This example uses INSTR and GOTO statements.

```
100 ON 1+INSTR(" YN",A$) GOTO 110,110,130,150
110 'HANDLE EXCEPTIONS
120 GOTO 160
130 'HANDLE A$="Y"
140 GOTO 160
150 'HANDLE A$="N"
160 'CONTINUE WITH THE PROGRAM
```

End

Program Listing 4. A common mistake: using GOTOs instead of For. . .Next Loops.

```
100 IF I>5 THEN 200
110 'DO SOMETHING
120 I=I+1:GOTO 100
200 'DO SOMETHING ELSE
```

End

grammer and buried it in the compiler. In effect they are saying that compilers can be trusted to use GOTOs correctly, but programmers cannot.

I'd rather teach programmers the right way to use a GOTO. I have a lot of confidence in human ability. Let's take another look at the example in Listing 2 and see what can be done to improve the program.

To avoid checking the negative of each

selection, you could write the code as in Program Listing 3. INSTR returns the position of the first character that matches the search string. So, if A\$ isn't "Y" or "N," the INSTR function will return zero. In that case, adding 1 makes the computed GOTO branch to line 110.

To guard against the possibility that A\$ is a null string (a string of zero length), the code includes a duplicate branch to line 110. If A\$ is null, INSTR

always returns a value of 1. Adding 1 makes the computed GOTO branch to line 110, just as it does when A\$ is neither "Y" nor "N." That's why there's a space before the Y and N. As a side benefit, the branch will also go to line 110 if the value of A\$ is left blank.

If A\$=Y, INSTR returns a value of 2. Adding 1 makes the result 3, which forces a branch to line 130, and so on. This is a good way of handling choices, as in a program menu. You can extend the code to handle choices longer than a single letter, as well.

When compiled, this approach is more efficient than most Case statements, because the program checks the value of A\$ only once. In a typical series of Case statements, the program checks the value of the variable at each Case, and the order in which it does so is important. This makes analysis and design more difficult. The program will run faster if it checks the most common choices first.

A Basic programmer could likewise simulate Until loops and more sophisticated control structures by using a GOTO. The effect is virtually identical to the hidden GOTOs used in structured languages—and the procedure is more efficient!

Improper GOTOs

Though Basic programs almost always include GOTOs, the average programmer uses far too many. I once had to modify a Basic program that contained about 150 lines of code and used over 450 GOTOs or computed GOTOs! This is what's commonly called "spaghetti code." Those who write it shouldn't be using Basic; they should be sentenced to Pascal, with no time off for good behavior.

In the last three years, I haven't written a single program that uses more than 80 GOTOs. Some of these programs are over 550 lines and 1,700 statements long.

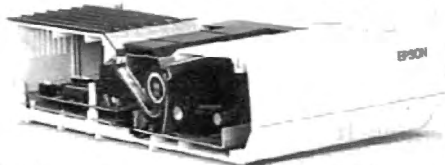
Programmers who can't be trusted to use a GOTO properly generally make one of the following mistakes:

- Using a GOTO to jump to another GOTO
- Using a GOTO to exit a For. . .Next loop
- Using a GOSUB to branch to a GOTO
- Using a GOTO to move from the middle of one subroutine to the middle of another subroutine
- Using a GOTO when a For. . .Next loop would be more appropriate

If you ever write a program with a GOTO that jumps to another, try rewriting it. Otherwise, think of how the program will look to you in six months.

Circle 452 on Reader Service card.

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

Dresselhaus

Sample of letter without Dots-Perfect **g**



EPSON is a trademark of EPSON-America, Inc.

837 E. Alosta Ave., Glendora, CA 91740 Tel: (818) 914-5831
An upgrade kit for EPSON FX, JX and RX printers

THE ART of PROGRAMMING

Better yet, think how it will look to someone else who has to modify it, and have a little pity!

The problem with using a GOTO to exit a For. . .Next loop is that most versions of Basic save the address of the start of the loop in memory. The address will be saved even if you exit the loop by avoiding the Next. Do this enough and you could end up using all of the available memory for the addresses. Chances are something will get damaged. You can get some strange error messages this way!

You can be forgiven for occasionally using a GOSUB to branch to a GOTO, as most versions of Microsoft Basic contain a bug that makes it necessary. In Microsoft Basic, if you use a computed GOSUB with many options—50, let's say—they won't all fit on a line. If you split them up on several lines, the computed GOSUB won't work—but a computed GOTO will.

I don't know of any other reason to use a GOSUB to branch to a GOTO. The technique only makes your programs difficult to debug and understand.

Programmers who use a GOTO to move from the middle of one subroutine to the middle of another usually think they are saving memory. They are wrong.

Programmers who apply this technique when writing programs in modules (chunks of logical functions and subroutines) don't understand the memory penalty involved. GOSUB requires the same memory as GOTO; the extra Return will cost 2 bytes.

In any case, a modular program that uses this technique is poorly written. It's clear from the branching that the middle of the second module is really a separate one. If the program were written correctly, the programmer would split one or both of the modules.

The fifth mistake, using a GOTO when a For. . .Next loop would be more appropriate, is common. I've seen many programs that use routines like that in Program Listing 4. I know of only two situations that justify this technique. One is peculiar to the version of Basic used in the Model I and the Model III. On these machines, a For. . .Next loop will execute at least once, even if, for instance, the loop begins with FOR I=J TO 5 and J is 6. Such loops will not execute under Microsoft Basic 5.2 or under GW-Basic on MS-DOS machines. To prevent the loop from executing when it would be inappropriate, and to ensure that the program will run the same way on either a Model I or a

Model 4, you might want to use GOTO.

The other situation that justifies use of a GOTO instead of a For. . .Next loop is when the loop contains conditional logic that forces frequent branching. Branching out of a For. . .Next loop is a no-no, and you should avoid it.

Alas, most programmers who commit the fifth mistake have neither of these excuses. I get the distinct feeling that many just don't trust a For. . .Next loop.

GOTOs are perfectly proper under two general sets of conditions: to force program flow to a module, and to control flow within a module. The problem most inexperienced programmers encounter is in defining a module. Few really understand the concept of modularity, and most computer science instructors won't use a language like Basic to teach it. They'd rather use a language where modularity is enforced. Why? Because it makes teaching easier. In my next column, we'll look at how to achieve modularity in Basic programs. ■

Bruce Tonkin is an independent software developer, industry critic, and author of the The Creator data base manager. You can reach him at 34069 Hainesville Road, Round Lake, IL 60073.

Circle 152 on Reader Service card.



NEW PRINTERS ADDED! FIND YOURS BELOW. Good This Month

RIBBON SALE

EXACT REPLACEMENTS

PRINTER MAKE, MODEL NUMBER Contact us if your printer is not listed. We have many more in stock We can probably RELOAD your old cartridges	RIBBON SIZE Inches by Yards	NEW CARTRIDGES From the various manufacturers or made in our own shop Ready to use.	RELOADS You SEND your used CARTRIDGES to us. WE put OUR NEW INSERTS in them.	INSERTS EZ-LOAD™ DROPPIN, NO WINDING! EXACT REPLACEMENTS made in our own shop. Cartridges NOT included.
BASE 2, DIP 81-82-84-85, MPI 88-99-GX	1/2 x 20	\$20/2 \$57/6 \$108/12	\$7/1 \$6 ea 2 or more	\$15/3 \$54/12 \$288/72
CITOH Prowriter 1550-8510, NEC 8023-8025, APPLE DMP-IMAGEW	1/2 x 18	\$15/2 \$42/6 \$ 78/12	\$7/1 \$6 ea 2 or more	\$15/3 \$54/12 \$288/72
CITOH STARWRITER F-10-40 } Carbon Film Black DIABLO HYTYPE II } Fabric Black	5/16 x 130 NOT EXISTING 5/16 x 17	\$18/3 \$60/12 \$342/72 \$18/2 \$51/6 \$ 96/12	\$5 ea 3-11 \$4 ea 12 or more \$8/1 \$7 ea 2 or more	\$24/6 \$42/12 \$234/72 \$21/3 \$78/12 \$432/72
RADIO SHACK-TOSHIBA-COMMODORE-PANASONIC-RICOH Carbon Film - DWP 210 (Hytype II) DW II, DWP 410-510, RICOH 1200-1300-1600 Red, Green, Blue, Brown Fabric (Long Life), DWP 210 (Hytype II) DW II, DWP 410-510, RICOH 1200-1300-1600	1/2 x 52 5/16 x 145 1/8 x 145 1/4 x 130	RS DMP-2200 \$18/3 \$60/12 \$342/72 \$18/3 \$60/12 \$342/72 \$21/3 \$72/12 \$414/72	\$18/1 \$16 ea 2 or more \$5 ea 3-11 \$4 ea 12 or more \$5 ea 3-11 \$4 ea 12 or more \$6 ea 3-11 \$5 ea 12 or more	\$30/3 \$ 57/6 \$108/12 \$24/6 \$42/12 \$234/72 \$24/6 \$42/12 \$234/72 \$30/6 \$54/12 \$234/72
DMP-100, LP VII, COMMODORE 1525, GORILLA BANANA (1424) DMP-200, 120, (430 Inserts & Reloads Only) (1296) (1483) DMP-400-420, LP VI-VIII, PANASONIC KXP-130 - 1093 (1418) DMP-500 (1482) DMP-2100, TOSHIBA P1340-1350- 1351-351 (1442) LP-I-II-IV, CENTRONICS 730-737-739-779 (Zip Pack) (1413) LP III-V, CANON A1200 (1/2 x 7) (1414)	1/2 x 15 5/16 x 14 1/2 x 20 1/2 x 20 1/2 x 20 9/16 x 16 1/2 x 15	\$18/2 \$51/6 \$ 96/12 \$18/2 \$51/6 \$ 96/12 \$20/2 \$57/6 \$108/12 \$15/2 \$42/6 \$ 78/12 \$22/2 \$63/6 \$120/12 \$15/2 \$42/6 \$ 78/12 \$15/2 \$42/6 \$ 78/12	\$8/1 \$7 ea 2 or more \$8/1 \$7 ea 2 or more \$7/1 \$6 ea 2 or more \$7/1 \$6 ea 2 or more \$7/1 \$6 ea 2 or more \$7/1 \$6 ea 2 or more	\$21/3 \$78/12 \$432/72 \$21/3 \$78/12 \$432/72 \$15/3 \$54/12 \$288/72 \$15/3 \$54/12 \$288/72 \$15/3 \$54/12 \$288/72 \$15/3 \$54/12 \$288/72 \$12/3 \$45/12 \$252/72 \$15/3 \$54/12 \$288/72
EPSON LQ 1500 MX-FX-RX 70-80, IBM PC (Standard Paper) LX80 (5/16 x 7) MX-FX-RX 100, IBM PC (Wide Paper)	1/2 x 14 1/2 x 20 1/2 x 30	\$20/2 \$57/6 \$108/12 \$14/2 \$36/6 \$ 66/12 \$18/2 \$51/6 \$ 96/12	\$7/1 \$6 ea 2 or more \$7/1 \$6 ea 2 or more \$8/1 \$7 ea 2 or more	\$15/3 \$54/12 \$288/72 \$15/3 \$54/12 \$288/72 \$18/3 \$66/12 \$360/72
NEC Spinwriter-Carbon Film -2000-3500 (Reloads BCCOMPCO Only) -5500-7700 (Can Reload Most Types) -2000-3500 (Can Reload All) -5500-7700 (Can Reload All) Pinwriter P1-P2 P3	5/16 x 145 NOT EXISTING 1/4 x 145 1/2 x 14 1/2 x 13 1/2 x 20 1/2 x 27	\$18/3 \$60/12 \$342/72 \$18/3 \$60/12 \$342/72 \$15/2 \$42/6 \$ 78/12 \$25/2 \$69/6 \$126/12 \$30/2 \$84/6 \$156/12	\$5 ea 3-11 \$4 ea 12 or more \$5 ea 3-11 \$4 ea 12 or more \$8/1 \$7 ea 2 or more \$8/1 \$7 ea 2 or more \$7/1 \$6 ea 2 or more \$8/1 \$7 ea 2 or more	\$24/6 \$42/12 \$234/72 \$24/6 \$42/12 \$234/72 \$15/3 \$54/12 \$288/72 \$15/3 \$54/12 \$288/72 \$18/3 \$66/12 \$360/72
OKIDATA Pacemark 2350-2410 Black Microline 182-192-193 ML-80-82-83-92-93 (Call for ML-84 Prices)	1/2 x 100 Inker Loop 1/2 x 16	\$32 each \$20/2 \$57/6 \$108/12 \$21/6 \$36/12 \$198/72	\$20/1 \$18 ea 2 or more	\$36/3 \$132/12 \$720/72
MANNESMAN-TALLY MT-160 MT-180 Spirit 80 (SP80) COMMODORE 1526 (Multistrike)	9mm x 11 9mm x 13 1/2 x 35	\$19/2 \$54/6 \$102/12 \$20/2 \$57/6 \$108/12 \$16/2 \$45/6 \$ 84/12		
PANASONIC KXP-1090-1091-1092	Inker Loop	\$20/2 \$57/6 \$108/12		
BROTHER HR-15-25-35 } COMREX DX-15, II } Carbon Film (Multistrike) Fabric (Call for Comrex 420 Prices)	5/16 x 82 5/16 x 17	\$18/3 \$60/12 \$342/72 \$15/2 \$42/6 \$ 78/12		

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

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 Shrayver. 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
Sidekick, 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

Bank Street Writer	\$ 51
Dollars and Pence	115
Micro Cookbook	29
Managing Your Money	113
Newsroom	30
Print Shop	38
Print SShop Graphics Library	22

CABLES

TRS-80 Printer cable 26-1401	\$ 89
IBM Parallel Printer Cable 6'	15
IBM Parallel Printer Cable 10'	22
Keyboard Extender Cable, 6'	10
TTL Monitor Extender Cable 6'	10
Standard 25 pin RS232 Cable 10'	20
Gender Changer. Specify M/M or F/F	.9
Printer A/B Switch Box Cable 6'	20

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 SPM 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



Put a Tail On Your Variables

The November 1983 Next Step (p. 26) includes a utility that displays active variables in a Model III Basic program and helps you create faster programs with fewer typographical errors. Several Model 4 owners have asked for something similar. The result is this month's program (see the Program Listing).

The method Basic uses for storing variables has important implications for programmers. Immediately above a tokenized Basic program in memory is a table of simple (nonarray) variables and user functions; immediately above that table is another that contains arrays. Whenever Basic needs to use a variable, it starts at the bottom of the appropriate table and searches until it finds the variable. If Basic is unable to find a variable, it creates a new one and moves the entire array table up in memory to make room.

One way to speed up your programs is to handle these variable tables efficiently. Since Basic searches for each variable from the beginning of its respective table, you can speed up some programs considerably by placing the most-used variables (or those used in time-critical loops) at the beginning of the tables. In addition, you can place all simple variables in their tables before defining any array variables.

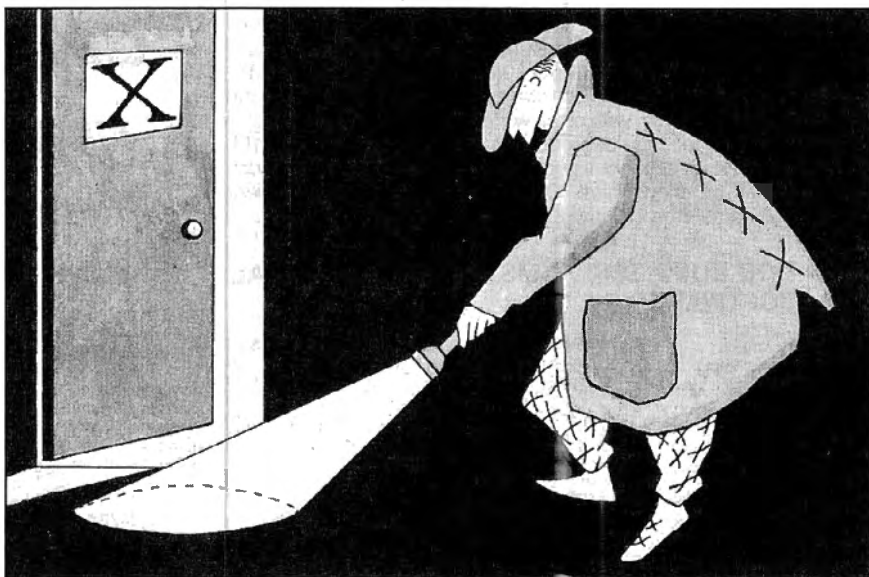
A DIM View

The easiest way to place simple variables and arrays in their tables in order is with Basic's DIM command. If your program starts by dimensioning or initializing all simple variables before allocating space for arrays, Basic won't have to shift the arrays around in memory every time it meets a new simple variable. You will also be able to enter variables into the tables in the order that you determine is most efficient.

LOAD
80

System Requirements

Model 4
TRSDOS 6.x
Basic



You can also speed up a Basic program by ensuring that every numeric variable is defined with the lowest possible precision. If you are using a variable as a simple counter for a While...Wend or For...Next loop, or as an index to an array, you should be sure to define and use it as an integer. If you don't explicitly define the type of a numeric variable, either with a DEF-type statement or a type marker, Basic assumes you want to use single-precision.

The designers of Basic probably chose single-precision as a default to keep beginning programmers from becoming confused about variable typing. However, once you become concerned about the efficiency of a program, you are no longer a beginner. Your programs will run much faster if you use integer variables whenever possible and avoid double-precision variables except when you are willing to sacrifice execution speed for the extra precision.

This month's program will help you with both tasks. After you have installed it as a keyboard filter, you can press control-V from Basic to generate a list of all active variables and user functions and their order in the variable tables. The program will send the list to the video display, your printer, or a disk file. You can then use the list to generate a set of

DIM statements that will make your program more efficient, to refine your definitions of array sizes, or to help generate a cross-reference list of variables that your program uses.

The program generates variable lists in a slightly unusual form. It shows the type of each variable first (using the same symbols as Basic does) and then the variable name. I decided to display the type first to emphasize the importance of variable typing, as well as to simplify sorting the variables from a disk file list.

Although the program is long, it is not complex. It begins by defining the supervisory calls (SVCs) that it will use, as well as other constants. The most important values in the list of constants are those that identify Basic's pointers to the variable tables; those values will probably be different in versions of Model 4 Basic other than 01.01.00.

The program also uses four macro commands. The first simply calls an SVC. The second prints a message on the screen. The third, OUTP (line 630), is similar to the Print macro, but sends its output to the current output device or file. The final macro is one that I have developed to help with menus in Assembly-language programs. If you are using an assembler other than EDAS IV, Pro-

Create, or MRAS, you will have to re-write the macro commands or expand them by hand. Consult last January's Next Step (p. 108) for an explanation of how to do so.

Heading Out

The program begins on line 850 by defining a standard TRSDOS 6 memory header. Any program, filter, or driver that you load into protected memory must start with such a header to work with other high and low memory programs.

Following the header is a storage area block that contains all of the data the program needs except for message text at the end of the resident part of the program. The first storage location, labeled Active, is a flag that the program uses to determine if it is currently active. I did not design the program to be reentrant, which means that if you accidentally invoke it while it is running, the system will almost certainly crash.

The program stores a byte of 0FF hexadecimal (hex) in that location when it is running, and a 00 hex byte there when it returns control to Basic. If you should happen to press control-V while the program is running, it uses the Active byte to keep from invoking itself a second time.

The program also has space in the top storage area to store a code for the current output device, a count of the number of variables that have been sent to the current page, and Basic's type code for the variable that is being processed.

Three small buffers in this area collect a file name you enter, provide a device or file control block for output, and convert hexadecimal values into their ASCII equivalents. Finally, the first 8 bytes of Basic/CMD are stored here, as well as device specs for screen and printer output and the symbols Basic uses for variable types.

The next two sections of the program, Chain and Start, are standard beginnings for filter programs. The Chain routine is responsible for sending input requests and control bytes to the keyboard driver; the Start section examines each keystroke to see if you've pressed control-V to invoke the program.

Before the program can actually work, three conditions must be satisfied: You must press control-V (checked in line 1220), the program must not be currently active (line 1260), and Basic must be loaded and running (lines 1450-1580). This final condition is the most difficult to test. The program does it by examining the first 8 bytes at 3000 hex in an attempt to ensure that Basic is loaded, and by examining the system C-

Sample program:

```
10 OPTION BASE 1      After the program runs, the following will be in
20 COUNT% = 1        memory (addresses may differ):
30 DIM A$(2,3,4)
```

Address	Contents	Meaning
719F	64	Simple variable table
71A0	83	begins at 8364 hex
71A1	6D	Array variable table
71A2	83	begins at 836D hex
71A3	C2	Free space area
71A4	83	begins at 83C2 hex

Simple Variable Storage:

8364	02	Integer variable type code
8365	43 'C'	First two letters
8366	4F 'O'	of variable name
8367	03	Three more characters in variable name
8368	D5 'U' + 80H	Last
8369	CE 'N' + 80H	three letters
836A	D4 'T' + 80H	of variable name
836B	01	Current value stored
836C	00	in variable (00 01 = 1)

Array Variable Storage:

836D	03	String variable type code
836E	41 'A'	First letter of variable name
836F	00	No second letter
8370	00	No following characters in name
8371	4F	Offset to next array variable
8372	00	(8373H + 004FH = 83C2H)
8373	03	Three dimensions in array
8374	04	Four elements in
8375	00	last dimension
8376	03	Three elements in
8377	00	middle dimension
8378	02	Two elements in
8379	00	first dimension
837A-83C1		72 bytes of 00
		(4 * 3 * 2 elements) * (3 bytes per element)

Figure. Variable Storage in Basic 01.01.00

Program Listing. Active Variable Analyzer.

```
00100 ;-----
00110 ;
00120 ; Active Variable Analyzer for TRSDOS 6.2
00130 ; and Basic 01.01.00
00140 ;
00150 ; Assemble as VARS/FLT and install:
00160 ; SET *VA VARS
00170 ; FILTER *KI *VA
00180 ;
00190 ;-----
00200 ;
00210 ;SVCs used:
00220 @CHNIO EQU 14H
00230 @CLOSE EQU 3CH
00240 @CLS EQU 69H
00250 @DSP EQU 02H
00260 @DSPLY EQU 0AH
00270 @EXIT EQU 16H
00280 @FLAGS EQU 65H
00290 @FSPEC EQU 4EH
00300 @GTMOD EQU 53H
00310 @HEXDEC EQU 61H
00320 @HIGHS EQU 64H
00330 @INIT EQU 3AH
00340 @KEY EQU 01H
00350 @KEYIN EQU 09H
```

Listing continued

Listing continued

```

00360 @MSG      EQU      0DH
00370 @PUT      EQU      04H
00380 @VDCTL    EQU      0FH
00390 ;
00400 ;Other constants:
00410 SVARPTR    EQU      719FH ;address of beg. of var table
00420 AVARPTR    EQU      71A1H ;addr. of beg. of array var table
00430 FSPCPTTR   EQU      71A3H ;addr. of beg. of free space
00440 CR        EQU      0DH ;Carriage return
00450 LF        EQU      0AH ;Line feed
00460 ETK       EQU      03H ;End of msg. -- no CR
00470 TOF       EQU      0CH ;Top of form (printer)
00480 KEY       EQU      16H ;Trigger for program: Ctrl-V
00490 ;
00500 ;-----
00510 ;Macro commands:
00520 ;
00530 SVC        MACRO    #NUM
00540 LD          A,#NUM
00550 RST        2BH
00560 ENDM
00570 ;
00580 PRINT      MACRO    #ADDR
00590 LD          HL,#ADDR
00600 SVC        @DSPLY
00610 ENDM
00620 ;
00630 OUTP      MACRO    #ADDR
00640 LD          HL,#ADDR
00650 SVC        @MSG
00660 ENDM
00670 ;
00680 MENURSP    MACRO    #LOW,#HIGH
00690 $$?1      SVC        @KEY
00700 AND        5FH
00710 CP         #LOW
00720 JR         C,$$?1
00730 CP         #HIGH+1
00740 JR         NC,$$?1
00750 LD        C,A
00760 SVC        @DSP
00770 ENDM
00780 ;
00790 ;-----
00800 ;
00810 ORG         3000H ;Will relocate to high memory
00820 ;-----
00830 ; TRSDOS Memory Header
00840 ;-----
00850 BEGIN      JR         START ;Jump around header
00860 OLDHI      DW         $$-$$ ;Word for old High$
00870 DB         MODDCB-BEGIN-5 ;Length of module name
00880 DB         'VARS'
00890 MODDCB    DW         $$-$$ ;Word for DCB address
00900 DW         0 ;Reserved for TRSDOS
00910 ;-----
00920 ; Storage area
00930 ;-----
00940 ACTIVE    DB         0 ;0=not active, 1=active
00950 OUTPUT    DB         0 ;Output type (0=screen,1=printer,2=file)
00960 COUNT    DB         1 ;Count of variables out
00970 TYPE     DB         0 ;Variable type
00980 KEYBUP   DS         15 ;Buffer for file/device spec
00990 DCB      DS         32 ;Device/file control block
01000 NUMBUF   DS         6 ;Buffer for number conversion
01010 SIGNAT   DB         0E4H,0E2H,27H,0F1H,0ECH,00H,2EH,0F1H
01020 ;Basic's 1st 8 bytes at 3000H
01030 SCRSPC   DB         'DO',CR ;Screen device spec
01040 PRTEPC   DB         'PR',CR ;Printer device spec
01050 SYMBOLS  DB         '%$! #'
01060 ;-----
01070 ; Link to *KI Chain
01080 ;-----
01090 CHAIN     PUSH      IX ;Save the old value
01100 LD        IX,(MODDCB) ;Get our DCB address
01110 RL01    EQU        $-2
01120 SVC     @CHNIO ;Move down the *KI chain
01130 POP     IX ;Recover orig. pointer
01140 RET
01150 ;-----
01160 ; Start of Filter Code
01170 ;-----
01180 START     JR         NC,CHAIN ;Go if not GET request
01190 CALL     CHAIN ;Else get keystroke
01200 RL02    EQU        $-2
01210 RET ;Return if no key
01220 CP     NZ ;Our trigger key?
01230 JR     NZ,NOSTART ;No -- leave quickly
01240 LD     A,(ACTIVE) ;Get current program status
01250 RL03    EQU        $-2
01260 OR     A ;Already active?
01270 JR     Z,START10 ;No -- get started
01280 LD     A,KEY ;Else replace keystroke
01290 NOSTART CP     A ;Set Z-flag
01300 RET ;And leave
01310 ;-----
01320 ; Save registers before processing
01330 ;-----
01340 START10  DEC     A ;A = -1
01350 LD     (ACTIVE),A ;Show program active
01360 RL04    EQU        $-2
01370 PUSH  BC ;Save everything
01380 PUSH  DE

```

Listing continued

Flag to see if high memory allocation has been disabled.

These two tests are not conclusive, but they do provide a fair amount of protection against accidentally invoking the filter when Basic is not active. If you try hard enough, you can fool the filter into running when Basic is not active; you will probably cause a system crash by doing so.

After these tests, the program goes to work in line 1750 at the Start20 label. It first asks you to pick an output path. If you want to send the variable lists to a disk file, the program also prompts you for a file name. It then proceeds to open the output device or file (lines 2090-2190) and announces that it is starting to list the simple variables. Once the output path is open, the DE register must continue to point to the device or file control block if output is to be correctly directed.

Errors can occur when you type in a file name and the file is opened. This program doesn't report such errors and ask the user to try again; instead, it merely returns to Basic. This approach is not as friendly as continuing to prompt for input until there are no errors, but it is easier to program.

Listing the simple variables is not at all difficult. In the simple variable table, Basic first stores the variable's type code: 02 hex for integers, 03 hex for strings, 04 hex for single-precision values, and 08 hex for double-precision values. Those are not arbitrary values; each is the exact number of bytes needed to accommodate the variable's data or, for strings, a length-byte and pointer to the actual string data.

Following the code byte, Basic stores the first two characters of the variable's name. If a variable name is only a single character long, the second position contains a 00 hex byte.

Basic then stores a count of the number of additional characters in the name; this information is followed by those characters. However, these "extra" characters are stored in a special form with their high bits set (ASCII values plus 128). Finally, the actual value of the variable is stored. The Figure summarizes the storage format.

The program prints the list of simple variables by setting one index register, IX, to the beginning of the simple variable table and the other, IY, to the beginning of the array variable table. The IX register is updated after each variable is decoded and printed. When the two registers are equal, the end of the table has been reached. Until that happens, the program calls a subroutine to actually decode and print the variable type and name. It calls another subroutine to de-

The program prints variable names, checks for a full page of output, and displays the dimensions and elements of each array.

termine if either the screen or a printer page is full.

The Way to Display

Displaying array variables is slightly more complex. The index registers are first pointed to the beginning of the array table and the beginning of Basic's free space, which is the end of the array table. The same routines print each variable name and check for a full page of output. However, the program also displays the number of dimensions in each array and the number of elements in each dimension.

After the name of an array variable, Basic uses 2 bytes to store an offset to the beginning of the next array variable. It then uses 1 byte to hold the number of dimensions in the array. Next, it uses 2 bytes to store the maximum number of elements for each dimension. These values, however, are stored in reverse order—the first 2 bytes show the maximum number of elements in the last or rightmost dimension and the last set of 2 bytes holds the number of elements in the first dimension. Finally, there is space to hold the current value of each element of the array.

Nothing in the array table indicates whether you have set Option Base 1 or Option Base zero (the default). Instead, the total number of possible elements is stored. If you are using Option Base zero, the number of elements stored in the array table, and the number reported by the program, will be one larger than the values you used in the DIM statement that defined the array.

It takes a fair amount of program code (lines 2680-3270 plus several subroutines) to decode and display all of the relevant information in the array variable table. After the program has finished doing that, it needs only to close the output path (including sending a top-of-form character to the printer or pausing and then clearing the video screen) before it restores the registers and returns

Listing continued

```

01390      PUSH    HL
01400      PUSH    IX
01410      PUSH    IY
01420      ;-----
01430      ;   Io Basic loaded?
01440      ;-----
01450      SVC     @FLAGS      ;Find the flags location
01460      BIT     0,(IY+'C'-'A') ;Is High$ inhibited?
01470      JR     Z,DONE      ;No -- Basic is not running
01480      LD     HL,3000H    ;HL==> beginning of program area
01490      LD     DE,SIGNAT   ;DE==> signature comparison table
01500 RL05   EQU     $-2
01510      LD     B,8        ;Check 8 bytes
01520 CKLOOP LD     A,(DE)   ;Get signature byte
01530      CP     (HL)       ;Compare with memory
01540      JR     NZ,DONE     ;Go if not the same
01550      INC     HL         ;Else bump
01560      INC     DE         ; both pointers
01570      DJNZ  CKLOOP     ;And repeat
01580      JR     START20    ;Okay -- get started
01590      ;-----
01600      ;   Get ready to leave
01610      ;-----
01620 DONE   POP     IY      ;Recover all registers
01630      POP     IX
01640      POP     HL
01650      POP     DE
01660      POP     BC
01670      OR     1         ;Set NZ flag
01680      LD     A,0        ;Return 'no character'
01690      LD     (ACTIVE),A ;Show program is done
01700 RL06   EQU     $-2
01710      RET
01720      ;-----
01730      ;   Opening screen & prompt
01740      ;-----
01750 START20 SVC    @CLS      ;clear the screen (old screen not saved)
01760      PRINT  OPENMSG    ;print opening message
01770 RL07   EQU     $-5
01780      MENURSP 'A','C' ;Response to menu
01790      SUB     'A'       ;Responses = 0,1, or 2
01800      LD     (OUTPUT),A ;And save response
01810 RL08   EQU     $-2
01820      LD     BL,KEYBUF  ;HL==> input area
01830 RL09   EQU     $-2
01840      OR     A         ;Screen output?
01850      JR     NZ,MENUB   ;No -- go
01860      LD     DE,SCRSPC  ;DE==> screen device spec
01870 RL10   EQU     $-2
01880      JR     DEVICE    ;Set device name
01890      ;-----
01900 MENUB  CP     1       ;Printer output?
01910      JR     NZ,MENUC   ;No -- go
01920      LD     DE,PRTSFC  ;DE==> printer device spec
01930 RL11   EQU     $-2
01940 DEVICE EX     DE,HL   ;DE==> input area
01950      LD     BC,4       ;Move 4 bytes
01960      LDIR          ;Move device spec
01970      JR     OPEN
01980      ;-----
01990 MENUC  PRINT  FILEMSG  ;Print file input prompt
02000 RL12   EQU     $-5
02010      LD     BC,14<8+0 ;B=14 chars./ C = 0
02020      LD     HL,KEYBUF  ;HL==> Our line buffer
02030 RL13   EQU     $-2
02040      SVC    @REYIN    ;Get file spec from user
02050      JR     C,DONE     ;If <Break> then leave
02060      ;-----
02070      ;   Open file or device and check for error
02080      ;-----
02090 OPEN   SVC    @CLS      ;First clear the screen
02100      LD     HL,KEYBUF  ;HL==> file or device name
02110 RL14   EQU     $-2
02120      LD     DE,DCB     ;DE==> device control block
02130 RL15   EQU     $-2
02140      SVC    @FSPEC    ;Check file specification
02150      JR     NZ,DONE    ;Error -- leave
02160      LD     HL,SECBUF  ;Else HL==> sector buffer
02170 RL16   EQU     $-2
02180      SVC    @INIT     ;Open file/device for output
02190      JR     NZ,DONE    ;Error -- leave
02200      OUTP  SHPLMSG    ;Output Simple variable message
02210 RL17   EQU     $-5
02220      ;-----
02230      ;   Output list of simple variables
02240      ;-----
02250      LD     A,1        ;Set beginning count
02260      LD     (COUNT),A ; to one line (page header)
02270 RL18   EQU     $-2
02280      LD     IX,(SVARPTR) ;IX==> Beginning of variable table
02290      LD     IY,(AVARPTR) ;IY==> Beginning of array table
02300 SMPL10 CALL  CMPDXY   ;Are they equal?
02310 RL19   EQU     $-2
02320      JR     Z,TRANS    ;Yes -- go
02330      CALL  VNAME     ;Display variable name
02340 RL20   EQU     $-2
02350      LD     C,CR       ;To next line
02360      SVC    @PUT      ;Output
02370      LD     A,(TYPE)   ;Get variable type
02380 RL21   EQU     $-2
02390      LD     C,A        ;Store in C
02400      LD     B,0        ;BC=length of data
    
```

Listing continued

Listing continued

```

02410      ADD     IX,BC           ;IX==> next variable
02420      CALL    PAGE          ;Check for end of page
02430 RL22  EQU     $-2
02440      JR      SMPL10       ;And loop back
02450 ;-----
02460 ; Transition to arrays
02470 ;-----
02480 TRANS  LD      A,(OUTPUT)   ;Get output type
02490 RL23  EQU     $-2
02500      DEC     A              ;Is it
02510      DEC     A              ; a file?
02520      JR      Z,TRANS20      ;Yes -- go
02530      INC     A              ;Is it the printer?
02540      JR      NZ,TRANS10     ;No -- go
02550      LD      C,TOF          ;Else
02560      SVC     @PUT          ; output Top-of-form
02570      JR      TRANS20       ;And go
02580 TRANS10 CALL    PAUSE       ;Pause video display
02590 RL24  EQU     $-2
02600 TRANS20 OUTP  ARRAYMSG     ;Display array message
02610 RL25  EQU     $-5
02620      LD      A,1           ;First count value
02630      LD      (COUNT),A    ;Store it
02640 RL26  EQU     $-2
02650 ;-----
02660 ; Now display array variables
02670 ;-----
02680      LD      IX,(AVARPTR)    ;IX==> Array variable table
02690      LD      IY,(PSPCPTR)   ;IY==> Beginning of free space
02700 ARRAY10 CALL  CMPXIY       ;End of list?
02710 RL27  EQU     $-2
02720      JR      Z,CLOSE       ;Yes -- go
02730      CALL    VNAME         ;Else display variable name
02740 RL28  EQU     $-2
02750      LD      C,(IX)        ;Get offset
02760      LD      B,(IX+1)      ; to next array variable
02770      INC     IX            ;Add 2 for space
02780      INC     IX            ; of offset word
02790      PUSH   IX            ;Save this location
02800      ADD     IX,BC         ;IX==> next array variable
02810      EX     (SP),IX       ;Recover present location
02820      LD      L,(IX)       ;Get count of dimensions
02830      PUSH   HL            ;Save count
02840      LD      H,0          ;HL = count of dimensions
02850      ADD     HL,HL        ;HL = HL * 2
02860      PUSH   HL            ;Transfer count
02870      POP    BC           ; to BC
02880      ADD     IX,BC        ;IX==> byte after last dimension size
02890      LD      C,'('       ;Show start of dimension list
02900      SVC     @PUT
02910      POP    BC           ;Recover count of dimensions
02920      LD      B,C          ;B has count
02930 ARRAY20 PUSH  BC         ;Save count
02940      LD      H,(IX)       ;Get MSB of dimension size
02950      LD      L,(IX-1)    ;And LSB
02960      PUSH   DE            ;Save FCB address
02970      LD      DE,NUMBUF    ;DE==> number for buffer
02980 RL29  EQU     $-2
02990      SVC     @HEXDEC      ;Convert to ASCII
03000      LD      A,ETX        ;End of number
03010      LD      (DE),A      ;Put at end of string
03020      POP    DE            ;Recover DCB address
03030      LD      HL,NUMBUF    ;HL==> ASCII of dimension size
03040 RL30  EQU     $-2
03050      LD      A,' '       ;Get space for comparison
03060 ARRAY30 CP      (HL)     ;Check NUMBUF character
03070      JR      NZ,ARRAY40   ;Not a space -- go
03080      INC     HL            ;Else increment HL
03090      JR      ARRAY30     ;And loop back
03100      LD      (DE),A      ;Print the number
03110 ARRAY40 SVC     @MSG      ;Move back two steps
03120      DEC     IX
03130      POP    BC           ;Get count
03140      LD      A,B          ;Count into A
03150      DEC     A            ;More than one left?
03160      JR      Z,ARRAY50    ;No -- go
03170      LD      C,', '       ;Else load C with comma
03180      SVC     @PUT          ;Send it out
03190 ARRAY50 DJNZ   ARRAY20   ;Loop until done
03200      LD      C,')'       ;Display end of array
03210      SVC     @PUT
03220      LD      C,CR         ;End of line
03230      SVC     @PUT
03240      POP    IX            ;IX==> next array
03250      CALL    PAGE         ;End of page?
03260 RL31  EQU     $-2
03270      JR      ARRAY10     ;Loop back until done
03280 ;-----
03290 ; Get ready to close up
03300 ;-----
03310 CLOSE  LD      A,(OUTPUT)   ;Get output type
03320 RL32  EQU     $-2
03330      DEC     A              ;Is it
03340      DEC     A              ; a file?
03350      JR      Z,CLOSE20     ;Yes -- go
03360      LD      HL,COUNT      ;HL==> output count
03370 RL33  EQU     $-2
03380      INC     A              ;Printer output?
03390      JR      NZ,CLOSE10    ;No -- go
03400      LD      A,(HL)       ;Get count
03410      OR     A            ;Is it 0?
03420      JR      Z,CLOSE20     ;Yes -- go

```

Listing continued

to Basic (see lines 3310-3600).

Four important subroutines sit in the resident part of the program. The first, CMPXIY (lines 3640-3740), compares the values in the IX and IY registers and sets the Z flag accordingly. It is used to test whether the loops that display variable names are completed.

The second subroutine, Pause (lines 3780-3910), prints a message at the bottom of the screen and waits for you to press a key. It then clears the screen and returns.

The VNAME subroutine (lines 3950-4340) is responsible for decoding and printing both the type and name of the variable that the IX register currently points to. It also distinguishes between user-defined functions and regular variables.

When you define a function in Model 4 Basic, it is stored in the simple variable table just as any other variable is. However, the first character of the function name is stored with its high bit set (ASCII value plus 128) so that Basic can distinguish between functions and normal variables. The address of the function in your Basic program is stored in the data field of the variable definition. Any formal variables that you used when you defined the function are also stored in the variable tables and look the same as regular variables.

The final subroutine, Page, checks to see if the bottom of the screen or bottom of a printer page has been reached. If so, it invokes the pause routine if the output is being sent to the screen, or sends a top-of-form character if output is being sent to the printer.

Following the Page subroutine are the messages that must be stored in high memory, along with a 256-byte buffer that TRSDOS uses if the output is going to a file. The remainder of the program is a standard installation routine that is almost identical to routines I've used in many other programs in this column.

One final word about increasing the speed of Basic programs. Basic's method of allocating and using string space is not very efficient, although it is easy for a programmer to use. Large programs, or those that handle a lot of string data, occasionally seem to freeze up while Basic rearranges the string area and performs its garbage collection routine. You can minimize or completely avoid long pauses for garbage collection in a number of ways, and I'll discuss some of them in a future column. ■

Write Hardin Brothers at 280 N. Campus Ave., Upland, CA 91786. Enclose a stamped, self-addressed envelope for a reply. You can also contact Hardin on CompuServe's WESIG (PCS-117).

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 1 3/4 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 400 bytes when not in use. While using TS-DOS, you will need only 2-4K.

TS-DOS is only \$69.95. If you own the Ultimate ROM II, or are purchasing it now, you can get TS-DOS at a \$20 discount. TS-DOS comes on a 3 1/2" disk and works automatically with the Ultimate ROM II or can be initially loaded using FLOPPY.CO with the Tandy Models 100/200 or by using a cassette drive with the NEC PC-8201.

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 3 1/2" 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 5 1/4" 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 © 1986 TRAVELING SOFTWARE, INC.	TRAVELING SOFTWARE, INC. 11050 FIFTH AVE. NE, SEATTLE, WA 98125	
	OUR PRODUCTS ARE AVAILABLE AT RADIO SHACK STORES & COMPUTER DEALERS NATIONWIDE!	
	NAME _____	PLEASE RUSH ME:
	SHIPPING ADDRESS _____	COPIES OF LAPDOS @ \$89.95
	CITY _____	COPIES OF TS-DOS @ \$69.95
	STATE _____ ZIP _____	COPIES OF ROM II @ \$229.95
	TELEPHONE _____	ROM II DISCOUNT _____
	LAPDOS SYSTEM REQUIREMENTS	SHIPPING _____ \$ 6.00
	128K IBM PC OR 100% COMPATIBLE COMPUTER WITH RS232 SERIAL PORT	SUBTOTAL _____
	WRITTEN PURCHASE ORDERS ACCEPTED	WA RES TAX ADD 7.9% _____

CIRCLE YOUR LAPTOP
 TANDY TANDY NEC
 M100 M200 8201
 AMOUNT ENCLOSED _____
 VISA MC COD CHECK
 EXP. DATE _____
 CARD # _____

**This Publication
is available in
Microform.**



**University Microfilms
International**

Please send additional information
for _____
Name _____
Institution _____
Street _____
City _____
State _____ Zip _____

300 North Zeeb Road
Dept. P.R.
Ann Arbor, Mi. 48106

Listing continued

```

03430 LD C,TOF ;Else eject a page
03440 SVC @PUT
03450 JR Z,CLOSE20 ;Then go
03460 ;
03470 CLOSE10 LD A,(HL) ;A has output count
03480 OR A ;Is it 0?
03490 JR Z,CLOSE20 ;Yes -- go
03500 CALL PAUSE ;Else pause
03510 RL34 EQU $-2
03520 ;
03530 ; Close output path and tidy up
03540 ;
03550 CLOSE20 SVC @CLOSE ;Close FCB
03560 SVC @CLS ;And clear the screen
03570 PRINT DONEMSG ;"Returning to Basic"
03580 RL35 EQU $-5
03590 JF DONE ;And return
03600 RL36 EQU $-2
03610 ;
03620 ; Compare IX and DX -- Return Z if equal
03630 ;
03640 CMPIXY PUSH HL ;Save registers
03650 PUSH DE
03660 PUSH IX ;Move IX value
03670 POP HL ; to HL
03680 PUSH IY ;Move IY value
03690 POP DE ; to DE
03700 OR A ;Clear carry flag
03710 SBC HL,DE ;Set Z flag
03720 POP DE ;Recover registers
03730 POP HL
03740 RET
03750 ;
03760 ; Pause during video display
03770 ;
03780 PAUSE PUSH HL ;Save registers
03790 PUSH DE
03800 PUSH BC
03810 LD HL,23<8+20 ;B=23, L=20
03820 LD B,3 ;Function: set cursor
03830 SVC @VDCPL ;Move cursor to bottom row
03840 PRINT PAUSMSG ;"Press a key..."
03850 RL37 EQU $-5
03860 SVC @KEY ;Wait for keystroke
03870 SVC @CLS ;Then clear screen
03880 POP BC ;Recover registers
03890 POP DE
03900 POP HL
03910 RET
03920 ;
03930 ; Output variable name
03940 ;
03950 VNAME LD A,(IX) ;Get type byte
03960 LD (TYPE),A ;And save
03970 RL38 EQU $-2
03980 SUB 2 ;Symbols = 0,1,2, or 6
03990 LD C,A ;Save in C
04000 LD B,0 ;BC-type
04010 LD HL,SYMBOLS ;HL==> symbol table
04020 RL39 EQU $-2
04030 ADD HL,BC ;HL==> type symbol
04040 LD C,(HL) ;Get type byte
04050 SVC @PUT ;Send it out
04060 LD C,' ' ;And a space
04070 SVC @PUT ;Send it out
04080 LD A,(IX+1) ;Get first character
04090 AND 80H ;High bit set?
04100 JR Z,VNAME10 ;No -- go
04110 OUTP FNMSG ;Else print function string
04120 RL40 EQU $-5
04130 VNAME10 LD A,(IX+1) ;Get character again
04140 AND 7FH ;Mask off high bit
04150 LD C,A ;Store character in C
04160 SVC @PUT ;Send it out
04170 LD A,(IX+2) ;Get second letter
04180 OR A ;Is there a 2nd char.?
04190 JR Z,VNAME20 ;No -- skip
04200 LD C,A ;Else load into C
04210 SVC @PUT ;And display it
04220 VNAME20 LD BC,4 ;Count to 1st ext. char.
04230 ADD IX,BC ;IX==> 1st ext. char.
04240 LD B,(IX-1) ;Get count of ext. chars.
04250 INC B ;Add one
04260 DEC B ;Zero extended chars.?
04270 RET Z ;Yes -- go
04280 VNAME30 LD A,(IX) ;Else get character
04290 AND 7FH ;Strip high bit
04300 LD C,A ;Set for output
04310 SVC @PUT ;Send it out
04320 INC IX ;IX==> next char.
04330 DJNZ VNAME30 ;Loop until done
04340 RET ;Then return
04350 ;
04360 ; Update count & check for end of page
04370 ;
04380 PAGE LD HL,COUNT ;HL==> number of vars. on page
04390 RL41 EQU $-2
04400 INC (HL) ;Add one
04410 LD A,(OUTPUT) ;Get output device
04420 RL42 EQU $-2
04430 DEC A ;Is it a
04440 DEC A ; disk file?

```

Listing continued



SOME HISTORIC BREAKTHROUGHS DON'T TAKE AS MUCH EXPLAINING AS COMPU SERVE.

But then, some historic breakthroughs could only take you from the cave to the tar pits and back again.

CompuServe, on the other hand, makes a considerably more civilized contribution to life.

It turns the personal computer into something useful.

CompuServe is an information service. Just subscribe, and 24 hours a day, 7 days a week, a universe of information, entertainment and communications is at your service.

A few of the hundreds of things you can do with CompuServe:

COMMUNICATE

Easyplex™ Electronic Mail puts friends, relatives and business associates in constant, convenient touch.

CB Simulator lets thousands of enthusiastic subscribers "chatter away" on 72 different channels.

Over 100 Forums welcome you to join their online "discussions." They're for everyone from computer owners and gourmet cooks to physicians and game players.

Bulletin Boards let you "post" messages where thousands will see them.

HAVE FUN

Our full range of games includes "You Gussed It!," the first online TV-style game show played for real prizes; Mega-Wars III, the ultimate in interactive excitement; board; parlor; sports and educational games.

SHOP

THE ELECTRONIC MALL™ gives you 'round the clock shopping for name brand goods and services at discount prices from nationally known stores and businesses.

SAVE ON TRIPS

TWA Travelshopper™ lets you scan schedules and fares, find the best bargains and order tickets online.

A to Z Travel/News Service provides latest travel news plus complete information on over 20,000 hotels worldwide.

MAKE PHI BETA KAPPA Grolier's Academic American Encyclopedia's Electronic Edition is a complete, constantly updated general reference encyclopedia.

The College Board, operated by the College Entrance Examination Board, helps you prepare for the SAT, choose a college and get financial aid.

BE INFORMED

The AP News Wire (covering all 50 states and the nation), the Washington Post, USA TODAY Update and business and trade publications are constantly available. And our electronic clipping service lets us find, clip and file specific news for reading at your convenience.

INVEST WISELY

Comprehensive Investment Help includes complete statistics on over 10,000 NYSE, AMEX and OTC securities. Historic trading statistics on over 50,000 stocks, bonds, funds, issues and options. Five years of daily commodity quotes. Standard & Poor's. Value Line. And over a dozen other investment tools.

Site II provides demographic and sales potential information by state, county and zip code for the entire country.

And now for the pleasant surprise.

Although CompuServe makes the most of any computer, it's a remarkable value. You get low start-up costs, low usage charges and local-phone-call access in most major metropolitan areas.

Here's how to use CompuServe.

CompuServe is "menu-driven," so beginners can simply read the lists of options on their screens and then type in their selections.

Experts can just type in "GO" followed by the abbreviation for whatever topic they're after.

In case of confusion, typing "H" for help brings immediate instructions.

And you can ask general questions either online through our free Feedback service or by phoning our Customer Service Department.

How to subscribe.

To access CompuServe, you'll need a CompuServe Subscription Kit; a computer, terminal or communicating word processor; a modem and in some cases, easy-to-use communications software.

With your Subscription Kit, you'll receive a \$25 usage credit, a complete hardcover Users Guide, your own exclusive user ID number and preliminary password, and a subscription to CompuServe's monthly magazine, *Online Today*.

Subscription Kits are available in computer stores, electronic equipment outlets, retail stores and catalogs. You can also subscribe with materials you'll find packed right in with many computers and modems sold today.

Make a move of historic proportions. Subscribe to CompuServe today.

To receive our free informative brochure or to order direct, call or write:

CompuServe®

Information Services
P.O. Box 20212, 5000 Arlington Centre Blvd.
Columbus, OH 43220

800-848-3199

In Ohio, call 614-457-0802

*And now,
a couple of words about high-quality
TRS-80 software at a very low price:*

The image shows the cover of the August 1985 issue of '80 micro' magazine. The cover features a photograph of a man and a woman on a beach. The man is sitting and looking at a magazine titled 'Disk System Owners Manual'. The woman is wearing a red cap and sunglasses, looking towards the camera. The magazine cover has the title '80 micro' in large yellow letters, with 'the magazine for TRS-80* users' below it. The issue date is 'AUGUST 1985' and the price is 'USA \$4.00 CANADA \$4.50'. A red banner in the top right corner lists 'Reviewed in This Issue: Superlog 4, GW-Basic Compiler, 3 Portable Printers, Monte's Window'. The main headline is 'MASTERING MODEL 4 BASIC' with the sub-headline 'What Better Way To Spend Your Summer?'. Other articles listed include 'PATCH WORK REVISITED: 13 More Ways To Upgrade TRSDOS 1.3', 'MODEL 4 MAGIC: Run 2 Programs Simultaneously With LDOS 5.1', and 'SOFTWARE RIOT!: Our Techies Pick Their Dream Libraries'. A barcode is at the bottom left. In the foreground, a black floppy disk is shown with a white label that reads 'LOAD 80', 'CW Communications/Peterborough', and '© 1985 Peterborough, NH 03458'. A yellow sticker on the disk says 'FEATURE: S-DOS Coils'. A white floppy disk is also visible at the bottom right, labeled 'SIDE B', 'LOAD 80', and '500 Baud'.

80 micro
the magazine for TRS-80* users

AUGUST 1985
USA \$4.00
CANADA \$4.50
A CWCI PUBLICATION

Reviewed in This Issue:
Superlog 4
GW-Basic Compiler
3 Portable Printers
Monte's Window

**MASTERING
MODEL 4 BASIC**
What Better Way
To Spend
Your Summer?

**PATCH WORK
REVISITED**
13 More Ways
To Upgrade
TRSDOS 1.3

MODEL 4 MAGIC
Run 2 Programs
Simultaneously
With LDOS 5.1

**SOFTWARE
RIOT!**
Our Techies
Pick Their
Dream
Libraries

LOAD 80
CW Communications/Peterborough
© 1985 Peterborough, NH 03458

FEATURE:
S-DOS Coils

SIDE B
LOAD 80
500 Baud
CW Communications/Peterborough
© 1985 Peterborough, NH 03458

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:

- 1 year of Load 80 on disk for \$199.97
 1 year of Load 80 on cassette for \$99.97
 Check/MO MC VISA AE
- This month's Load 80 disk for \$21.47
 This month's Load 80 cassette for \$11.47

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

8605

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 for
 Tandy 2000 2.09 2.00 1.90

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

Subscription Problems?

80 Micro does not keep subscription records on the premises, therefore calling us only adds time and doesn't solve the problem.

Please send a description of the problem and your most recent address label to:

80Micro

Subscription Dept.

PO Box 981

Farmingdale, NY 11737

Thank you and enjoy your subscription.

Circle 145 on Reader Service card.

YOU ALREADY HAVE HALF OF THE BEST WORD PROCESSING SYSTEM IN THE WORLD

For **\$49.95** more, your MultiMate, Display Write, WordStar, pfs:WRITE, VolksWriter, Writing Assistant or other WP Software¹ can instantly **50** columns of text, **50** automatically create outlines, calendars, newsletters, contracts, easy mail merges, screenplays, scripts, footnotes², **boxed copy** and lots more. It's fun with

PowerText FORMATTER

TO ORDER, CALL OR WRITE:

BEAMAN PORTER, INC.

417 HALSTEAD AVENUE
 HARRISON, NY 10528
 (800) 431-0007
 (914) 835-3156 IN NEW YORK

¹ Any other MS DOS or ASCII WP Software
² On the same page or end of your document
 Add \$3 for Shipping and Handling

THE NEXT STEP

Listing continued

```

04450 RET Z ;Yes -- go back
04460 INC A ;Is it the printer?
04470 JR NZ,PAGE10 ;No -- skip to screen check
04480 LD A,(HL) ;Get current count
04490 CP 60 ;60 print lines per page
04500 RET C ;Page not full -- go back
04510 LD C,TOF ;Else to next page
04520 SVC @PUT ;Set Top of form
04530 JR PAGE20 ;Set new page
04540 ;
04550 PAGE10 LD A,(HL) ;Get current count
04560 CP 23 ;23 lines per screen
04570 RET C ;Screen not full -- go back
04580 CALL PAUSE ;Else pause
04590 RL43 EQU $-2
04600 PAGE20 XOR A ;Set count to 0
04610 LD (HL),A ;And save
04620 RET ;Ready for new page
04630 ;
04640 ; Program messages
04650 ;
04660 OPENMSG DB LF,LF,LF,' Choose output',LF,LF
04670 DB ' A. Screen',LF
04680 DB ' B. Printer',LF
04690 DB ' C. Disk File',LF,LF
04700 DB ' Your choice ==> ',ETX
04710 FILEMSG DB LF,LF,' File name ==> ',ETX
04720 SMPMSG DB 'Active simple variables',CR
04730 ARRYMSG DB 'Active array variables',CR
04740 DONMSG DB 'End of active variables -- Returning to Basic',CR
04750 PAUSMSG DB 'Press any key to continue',EXX
04760 FNMSG DB 'FN ',ETX
04770 ;
04780 ; Sector buffer
04790 ;
04800 SECBUF DS 256
04810 ;
04820 FLTEND EQU $-1
04830 FLTLN EQU $-BEGIN
04840 ;
04850 ;
04860 ;=====
04870 ; Initialization
04880 ;=====
04890 INIT PUSH DE ;Save DCB pointer
04900 LD (MODDCB),DE ;Stuff into filter
04910 PRINT SIGNON ;Announce program
04920 LD DE,MODNAME ;DE==> Our module name
04930 SVC @GTMOD ;Already installed?
04940 JR NZ,VIASET ;No -- go
04950 LD HL,INSTLD ;Else HL==> error message
04960 ERR_OUT SVC @DSPLY ;Show error message
04970 LD HL,-1 ;Report error to TRSDOS
04980 SVC @EXIT ;And leave
04990 ;
05000 ; Installed with SET?
05010 ;
05020 VIASET SVC @FLAGS ;Get flag pointer in IY
05030 BIT 3,(IY+'C'-'A') ;Test SET bit
05040 JR NZ,SETHI ;SET used -- go
05050 LD HL,NOSET ;Else HL==> error message
05060 JR RRR_OUT ;And leave
05070 ;
05080 ; Get current HIGH$ address
05090 ;
05100 SETHI LD HL,0 ;Function: get value
05110 LD B,L ;B=0 ==> work with HIGH$
05120 SVC @HIGH$ ;Get HIGH$ value
05130 LD (OLDHI),HL ;Save in filter header
05140 JR Z,RELOC ;No error -- go
05150 LD HL,MEMERR ;HL==> error message
05160 JR ERR_OUT ;Report error and leave
05170 ;
05180 ; Move filter to high memory & protect
05190 ;
05200 RELOC LD IY,RELTAB ;IY==> list of relocation addr.
05210 LD DE,FLTEND ;DE==> end of the filter
05220 OR A ;Reset carry flag
05230 SBC HL,DE ;Calculate reloc. distance
05240 PUSH HL ;Move distance
05250 POP BC ; to BC register
05260 RELOC1 LD L,(IY+0) ;Get LSB of address to change
05270 LD H,(IY+1) ; and MSB
05280 LD A,H ;Copy MSB
05290 OR A ;Is it 0?
05300 JR Z,MOVE ;Yes -- go
05310 LD E,(HL) ;Else pick up value
05320 INC HL ;DE==> MSB
05330 LD D,(HL) ;DE has old value
05340 EX DE,HL ;Value to HL
05350 ADD HL,BC ;Add the offset
05360 EX DE,HL ;Put value back in DE
05370 LD (HL),D ;And put back
05380 DEC HL ; into
05390 LD (HL),E ; the filter
05400 INC IY ;Bump twice
05410 INC IY ; to point to next addr.
05420 JR RELOC1 ;Repeat for all
05430 ;
05440 ; Move and protect
05450 ;
    
```

Listing continued

THE NEXT STEP

Circle 355 on Reader Service card.

Listing continued

```

05460 MOVE LD DE,(OLDHI) ;DE==> destination
05470 LD HL,FLTEND ;HL==> end of filter
05480 LD BC,FLTLEN ;BC = bytes to move
05490 LDDR ;Move it all
05500 EX DE,HL ;New HIGHT$ in HL
05510 LD B,0 ;Function: use HIGH$
05520 SVC @HIGH$ ;Have TRSDOS adjust HIGHS
05530 INC HL ;HL==> entry point
05540 ;-----
05550 ; Set type and address in filter's DCB
05560 ;-----
05570 POP IX ;Get DCB address from stack
05580 LD (IX),01000101B ;set as @GET/@CTL filter
05590 LD (IX+1),L ;Set LSB of address in DCB
05600 LD (IX+2),H ; and MSB
05610 PRINT SUCCESS ;Report successful installation
05620 LD HL,0 ;Show 'No Error'
05630 SVC @EXIT ;And return to TRSDOS
05640 ;-----
05650 ; Installation messages
05660 ;-----
05670 MODNAME DB 'VARS',CR
05680 SIGNON DB LF,'Basic Variable Analyzer',LF,CR
05690 INSTLD DB 'Program already installed -- installation aborted.',CR
05700 NOSET DB 'Program must be installed with SET.',CR
05710 MEMERR DB 'High memory not available for installation.',CR
05720 SUCCESS DB 'Installation successfully completed.',LF
05730 DB 'Use FILTER command to connect to *KI',LF
05740 DB 'CTRL-V to activate in Basic.',CR
05750 ;-----
05760 ; Relocation Table
05770 ;-----
05780 RELTAB DW RL01,RL02,RL03,RL04,RL05,RL06,RL07,RL08
05790 DW RL09,RL10,RL11,RL12,RL13,RL14,RL15,RL16
05800 DW RL17,RL18,RL19,RL20,RL21,RL22,RL23,RL24
05810 DW RL25,RL26,RL27,RL28,RL29,RL30,RL31,RL32
05820 DW RL33,RL34,RL35,RL36,RL37,RL38,RL39,RL40
05830 DW RL41,RL42,RL43,0
05840 ;
05850 END INIT
    
```

End

LARGE CAPACITY ACCOUNTING PROGRAMS
 For TRS-80
 1, 3, 4, MSDOS
 or compatibles
 Requires only
 48K & 2 Drives &
 80 Column Printer

NEW MSDOS **MODEL 4&4D** **NEW**

ACCTS RECEIVABLE \$150.00
 5000 ACCTS. & 15000 TRANS.
 BALANCE FORWARD 99 TRANSACT CODES
 30-60-90-120 AGED STATEMENTS SHOW
 DATE / INV # / DESCRIP / AMT / & AGEING
 SELECTIVE FINANCE CHARGES & RATES.
 FAST ENTRY POSTING W/AUDIT REPORT
 SUB-ACCTS. % CREDIT LIMIT DATE OF LAST
 PAYMENT LABELS AND MORE. ADD \$50.00
 FOR INVOICING MODULE. OTHER OPTIONS
 AVAILABLE - CALL

ACCTS PAYABLE \$50.00
 DERIVED FROM OUR A/R - WRITES CHECKS

GENERAL LEDGER \$150.00
 400+ACCTS. 5000+TRANS/MONTH
 - BEST LOOKING FINANCIAL STATEMENTS
 - DEPARTMENTAL P&L (UP TO 9) + %
 - STATEMENT OF CHANGES
 - SUB-TOTALS WHERE YOU WANT
 - FAST FLEXIBLE POSTING INPUT

DEMO FOR ABOVE \$20.00 EACH + S&H
 WITH MANUAL, DISK, SAMPLE DATA

COMBINATION SPECIALS
 #1 A/R & G/L FOR \$200.00
 #2 A/R, A/P & G/L FOR \$225.00
 SUPER P/R PAYROLL - THE BEST \$200.00

VISA **H.D.P.** MC
 2386 Lincoln, Oroville, CA 95966
 916/533-5992
 MON-FRI 8AM TO 2 PM

ADD 3.00 S&H TO ALL ORDERS ADD 3.00 IF COD

Circle 71 on Reader Service card.

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

Program Listing 1. Basic version of Sideport.

```

20 1 *****
30 1 *                               *
40 1 *           SIDEPORT           *
50 1 *                               *
60 1 *           A TRS-80 MODEL 4 / MODEL 100 *
70 1 *           COMMUNICATIONS UTILITY *
80 1 *           TRSDOS 6.2         *
90 1 *           BY                 *
100 1 *          JOHN D. WOLFSKILL *
110 1 *                               *
120 1 *****
130 1
140 1 *****
150 1 * Note: TRSDOS 6.0/6.1 USERS MUST CHANGE *
160 1 * THE LAST DATA BYTE IN LINE 450 *
170 1 * TO DECIMAL VALUE: 249 AND THE *
180 1 * SECOND DATA BYTE IN LINE 260 TO *
190 1 * DECIMAL VALUE: 952 *
200 1 *****
210 CLS:DIH CHECKTOT(47):INSTALL=6HPE31
220 PRINT"Installing Sideport driver..";
230 FOR JW=1 TO 47
240 READ JW:CHECKTOT(JJ)=JW
250 NEXT
260 DATA 822,955,1411,1144,919,1187,1066,597,632,807
270 DATA 1567,1635,1238,1292,967,648,1118,446,921,1422
280 DATA 1128,1947,751,976,1101,1639,1193,1082,1397,1540
290 DATA 1199,1567,777,1335,861,1204,1048,1840,1515,911
300 DATA 1039,844,456,1104,1147,1560,464
310 FOR JB=650731 TO 655321
320 READ JW:DAT=DAT+1
330 CHECKSUM=CHECKSUM+JW
340 IF DAT=10 THEN LINEGROUP=LINEGROUP+1:GOSUB 910
350 POKE JB,JW
360 NEXT:CHECKSUM=0
370 FOR JB=655331 TO 655351
380 READ JW:POKE JB,JW
390 CHECKSUM=CHECKSUM+JW
400 NEXT
410 IF CHECKSUM<>CHECKTOT(47) THEN PRINT"Data statement error in line 900..":ST
OP
420 CLS:PRINT"Sideport driver installed..":FOR TD=1 TO 1000:NEXT
430 CLS:CALL INSTALL:SYSTEM
440 DATA 62,67,50,138,0,62,254,50,139,0
450 DATA 62,195,50,137,0,201,0,0,58,252
460 DATA 8,254,15,40,1,201,221,229,229,213
470 DATA 197,245,221,33,88,252,38,7,46,17
480 DATA 62,15,6,1,239,221,119,0,221,35
490 DATA 44,125,254,60,32,240,36,124,254,18
500 DATA 32,232,38,7,205,185,254,36,62,15
510 DATA 6,2,46,18,14,149,239,62,15,46
520 DATA 59,6,2,14,170,239,46,19,62,15
530 DATA 6,2,14,32,239,44,125,254,59,32
540 DATA 243,36,124,254,17,32,217,205,185,254
550 DATA 219,234,203,119,40,250,62,62,211,235
560 DATA 62,16,1,104,66,239,219,235,254,42
570 DATA 202,118,255,195,126,255,46,18,62,15
580 DATA 6,2,14,191,239,44,125,254,60,32
590 DATA 243,201,46,19,38,16,6,2,62,15
600 DATA 14,46,239,44,125,254,59,32,243,62
610 DATA 15,6,3,38,16,46,19,239,62,2
620 DATA 14,14,239,221,33,48,252,38,16,46
630 DATA 19,62,8,239,254,3,202,126,255,254
640 DATA 13,40,36,254,8,40,201,254,32,250
650 DATA 240,254,254,123,242,240,254,221,119,0
660 DATA 79,62,2,239,44,62,15,6,3,239
670 DATA 125,254,59,40,4,221,35,24,208,6
680 DATA 40,221,54,0,13,221,33,48,252,219
690 DATA 234,203,119,40,250,221,126,0,211,235
700 DATA 254,13,40,4,221,35,16,237,205,168
710 DATA 255,38,8,46,19,6,2,219,235,254
720 DATA 127,202,201,254,254,13,40,22,79,205
730 DATA 239,255,62,15,239,62,17,211,235,205

```

Listing 1 continued

Listing 1 continued

```

740 DATA 168,255,44,125,254,59,40,9,24,221
750 DATA 62,17,211,235,205,168,255,36,124,254
760 DATA 16,40,65,24,204,6,17,62,104,239
770 DATA 195,201,254,221,33,88,252,38,7,46
780 DATA 17,62,15,6,2,221,78,0,239,221
790 DATA 35,44,125,254,60,32,240,36,124,254
800 DATA 18,32,232,62,2,14,15,239,241,193
810 DATA 209,225,221,225,201,219,235,254,19,32
820 DATA 250,219,235,254,19,40,250,201,38,9
830 DATA 46,19,62,15,6,1,239,79,205,239
840 DATA 255,62,15,6,2,37,239,44,125,254
850 DATA 59,40,3,36,24,232,36,36,124,254
860 DATA 16,32,223,46,19,37,62,15,6,2
870 DATA 14,32,239,44,125,254,59,32,243,62
880 DATA 15,38,15,195,66,255,62,8,239,254
890 DATA 96,204,248,255,201,62,1,239,254,0
900 DATA 192,24,248
910 IF CHECKSUM<>CHECKTOT(LINEGROUP) THEN PRINT"Data statement error in line ";
430+(LINEGROUP*10);:STOP
920 DAT=0:CHECKSUM=0:RETURN

```

End

Program Listing 2. Source code for Sideport.

```

00110 ; *****
00120 ; *                               *
00130 ; *           SIDEPORT           *
00140 ; *                               *
00150 ; *           A TRS-80 MODEL 4 / MODEL 100 *
00160 ; *           COMMUNICATIONS UTILITY *
00170 ; *           BY                 *
00180 ; *                               *
00190 ; *          JOHN D. WOLFSKILL *
00200 ; *          201 PURITAN DRIVE *
00210 ; *          MIDDLETOWN, RI 02840 *
00220 ; *                               *
00230 ; *****
00240 ;
00250 SCRBUF EQU 64600 ; VIDEO BUFFER
00260 LINBUF EQU 64560 ; COMMAND LINE BUFFER
00270 HOOK EQU 138 ; @KITSK VECTOR (LSB)
00280 HOOK1 EQU 139 ; @KITSK VECTOR (MSB)
00290 @KITSK EQU 137 ; @KITSK CALL
00300 VCTR EQU 67 ; (LSB) START ADDRESS
00310 VCTR1 EQU 254 ; (MSB) START ADDRESS
00320 KYLTCH EQU 2300 ; TRSDOS 6.2.0 KEYLATCH
00330 ; -----
00340 ; NOTE: KYLTCH ADDRESS FOR TRSDOS VER. 6.0 / 6.1
00350 ; IS 2297 DECIMAL
00360 ; -----
00370 ORG 65073 ;
00380 INSTALL LD A,VCTR ; LSB ROUTINE START
00390 LD (HOOK),A ; INTO @KITSK HOOK
00400 LD A,VCTR1 ; MSB ROUTINE START
00410 LD (HOOK1),A ; INTO @KITSK HOOK
00420 LD A,195 ; JUMP TO START
00430 LD (@KITSK),A ; HOOK INTO KYBD DRIVER
00440 LD A,22 ; @EXIT SVC # 22
00450 RST 28H ; RETURN TO TRSDOS READY
00460 START LD A,(KYLTCH) ; SCAN KEYLATCH
00470 CP 15 ; IS IT <CTRL>
00480 JR Z,SDPRT ; JUMP TO ROUTINE
00490 RET ; RETURN TO KEYBOARD DRIVER
00500 SDPRT PUSH IX ; SAVE REGISTERS
00510 PUSH HL ;
00520 PUSH DE ;
00530 PUSH BC ;
00540 PUSH AF ;
00550 OPNWIN LD IX,SCRBUF ; OPEN THE WINDOW

```

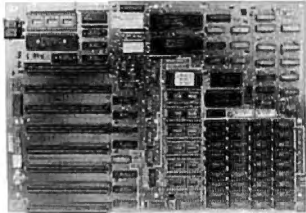
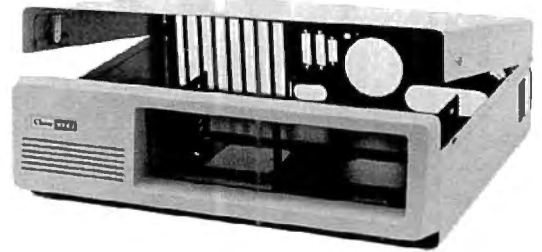
Listing 2 continued

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

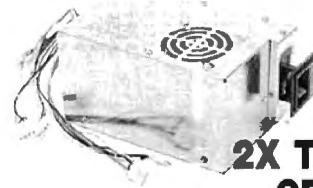
Start with our high quality steel case with a flip-top that makes changing cards a snap. You won't void our warranty by opening the case. This is the foundation of your system. No cheap, flimsy plastic here. There are 8 slots and 7 of them accept both short and regular full length IBM add-on cards. You 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

The Multi I/O card provides for 5 major functions—floppy disk drives (up to 4 DS/DD 380K 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



2X THE POWER OF AN IBM



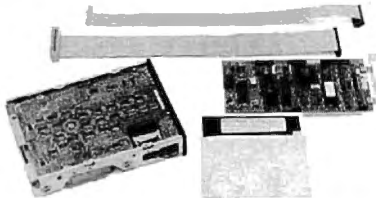
Standard \$ 89



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



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 320 x 200 four color graphics and 640 x 200 monochrome graphics \$ 99



Hi-Res Monochrome \$ 129



Color Graphics \$ 99

Our monochrome graphics display card is Hercules compatible with a 720 x 348 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

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 380K Floppy		Multi I/O Card		20MB Hard Drive	
Color Graphics Card		1 Half-high 380K Floppy		Multi I/O Card	
Composite Monochrome Display		Color Graphics Card		1 Half-high 380K Floppy	
5150 Standard Keyboard		Composite Monochrome Display		Color Graphics Card	
DOS 2.11 and BASIC		5150 Standard Keyboard		5150 Standard Keyboard	
		DOS 2.11 and BASIC		DOS 2.11 and BASIC	

Clone smolO

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 \$60 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 Others

Listing 2 continued

```

00560 LD H,7 ; SCREEN ROW 7
00570 OPNWN1 LD L,17 ; SCREEN COL 17
00580 OPNWN2 LD A,15 ; SVC # 15,@VDCTL
00590 LD B,1 ; FUNCTION #1
00600 RST 28H ; GET CHARACTER
00610 LD (IX+0),A ; PLACE IN SCREEN BUFF
00620 INC IX ; BUMP SCREEN POINTER
00630 INC L ; THEN NEXT COLUMN
00640 LD A,L ; CHECK FOR END
00650 CP 60 ; OF WINDOW
00660 NZ,OPNWN2 ; LOOP IF NOT
00670 OPNWN3 INC H ; NEXT ROW
00680 LD A,H ; CHECK FOR END
00690 CP 18 ; OF WINDOW
00700 JR NZ,OPNWN1 ; LOOP IF NOT
00710 LD H,7 ; SCREEN ROW 7
00720 CALL GRPLNE ; DRAW GRAPHIC LINE
00730 INC H ; NOW NEXT ROW
00740 OPWIN1 LD A,15 ; SVC #15,@VDCTL
00750 LD B,2 ; FUNCTION #2
00760 OPWIN2 LD L,18 ; SCREEN COL 18
00770 LD C,149 ; GRAPHIC BYTE
00780 RST 28H ; DISPLAY IT
00790 LD A,15 ; SVC # 15,@VDCTL
00800 LD L,59 ; SCREEN COL 59
00810 LD B,2 ; FUNCTION # 2
00820 LD C,170 ; GRAPHIC BYTE
00830 RST 28H ; DISPLAY IT
00840 LD L,19 ; SCREEN COL 19
00850 FLBLK LD A,15 ; SVC# 15,@VDCTL
00860 LD B,2 ; FUNCTION # 2
00870 LD C,32 ; BLANK SPACE
00880 RST 28H ; DISPLAY IT
00890 INC L ; NEXT COL
00900 LD A,L ; CHECK FOR
00910 CP 59 ; END OF WINDOW ?
00920 JR NZ,FLBLK ; LOOP IF NOT
00930 INC H ; THEN NEXT ROW
00940 LD A,H ; CHECK FOR
00950 CP 17 ; END OF WINDOW
00960 JR NZ,OPWIN1 ; LOOP IF NOT
00970 CALL GRPLNE ; DRAW GRAPHIC LINE
00980 HLDOUT IN A,(234) ; CHECK RS232 XMTFR
00990 BIT 6,A ; HOLDING REG EMPTY BIT
01000 JR Z,HLDOUT ; LOOP IF NOT EMPTY
01010 LD A,62 ; STATUS WORD FOR MOD 100
01020 OUT (235),A ; IS MODEL 100 READY ?
01030 LD A,16 ; SVC #16,@PAUSE
01040 LD BC,17000 ; WAIT FOR ANSWER
01050 RST 28H ; a MICROSEC OR SO
01060 HLDIN IN A,(235) ; NOW POLL RECIEVER
01070 CP 42 ; IS MODEL 100 READY ?
01080 JP Z,BPRMPT ; BEEP IF READY
01090 JP CLOWIN ; CLOSE WINDOW IF NOT
01100 GRPLNE LD L,18 ; SCREEN COL 18
01110 OPGRPH LD A,15 ; SVC# 15,@VDCTL
01120 LD B,2 ; FUNCTION #2
01130 LD C,191 ; ALL BITS SET
01140 RST 28H ; DISPLAY BYTE
01150 INC L ; NOW NEXT COL
01160 LD A,L ; CHECK FOR
01170 CP 60 ; END OF WINDOW
01180 JR NZ,OPGRPH ; LOOP IF NOT
01190 RET ; WHEN DONE
01200 SETCOM LD L,19 ; SCREEN COL 19
01210 LD H,16 ; SCREEN ROW 16
01220 SET1 LD B,2 ; FUNCTION # 2
01230 LD A,15 ; SVC# 15,@VDCTL
01240 LD C,46 ; ASCII "-"
01250 RST 28H ; DISPLAY IT
01260 INC L ; NOW NEXT COL
01270 LD A,L ; CHECK FOR
01280 CP 59 ; END OF WINDOW
01290 JR NZ,SET1 ; LOOP IF NOT

```

Listing 2 continued

Listing 2 continued

```

01300 SETCUR LD A,15 ; SVC#15,@VDCTL
01310 LD B,3 ; FUNCTION # 3
01320 LD H,16 ; SCREEN ROW 16
01330 LD L,19 ; SCREEN COL 19
01340 RST 28H ; MOVE CURSOR
01350 LD A,2 ; @DSP SVC#2
01360 LD C,14 ; TURN ON
01370 RST 28H ; THE CURSOR
01380 LINPUT LD IX,LINBUF ; LINE BUFFER START
01390 LD H,16 ; SCREEN ROW 16
01400 LD L,19 ; SCREEN COL 19
01410 INPUT1 LD A,8 ; SVC# 8, @KBD
01420 RST 28H ; SCAN KYBD AND RETURN
01430 CP 3 ; IS IT <CTRL><C> ?
01440 JP Z,CLOWIN ; CLOSE WINDOW
01450 CP 13 ; END OF INPUT ?
01460 JR Z,XMIT2 ; START TRANSMISSION
01470 CP 8 ; BACKSPACE/ERASE LINE
01480 JR Z,SETCOM ; START OVER
01490 CP 32 ; BLANK SPACE ?
01500 JP M,INPUT1 ; OR LESS/DISREGARD
01510 CP 123 ; GREATER THAN "z"
01520 JP P,INPUT1 ; THEN DISREGARD
01530 LD (IX+0),A ; STORE IN LINEBUF
01540 LD C,A ; NOW INTO C
01550 LD A,2 ; @DSP, SVC#2
01560 RST 28H ; DISPLAY IT
01570 INC L ; NOW NEXT COL
01580 LD A,15 ; SVC# 15,@VDCTL
01590 LD B,3 ; FUNCTION # 3
01600 RST 28H ; ADVANCE CURSOR
01610 LD A,L ; CHECK FOR
01620 CP 59 ; OUT OF WINDOW
01630 JR Z,XMIT2 ; BEGIN TRANSMISSION
01640 INC IX ; BUMP BUFFER POINTER
01650 JR INPUT1 ; GET ANOTHER BYTE
01660 XMIT2 LD B,40 ; XMIT 40 CHARACTERS
01670 LD (IX+0),13 ; ENDING WITH <CR>
01680 LD IX,LINBUF ; LINEBUF ADDRESS
01690 XMIT1 IN A,(234) ; CHECK RS232C XMITTER
01700 BIT 6,A ; HOLDING REG EMPTY BIT
01710 JR Z,XMIT1 ; LOOP IF NOT EMPTY
01720 XMIT3 LD A,(IX+0) ; GET CHARACTER TO XMIT
01730 OUT (235),A ; TO THE XMITTER
01740 CP 13 ; IS IT A <CR> ?
01750 JR Z,RCEVE ; CHECK RECIEVER
01760 INC IX ; BUMP BUFF PTR
01770 DJNZ XMIT1 ; LOOP FOR ANOTHER BYTE
01780 RCEVE CALL WAIT ; WAIT FOR REPLY
01790 LD H,8 ; SCREEN ROW 8
01800 RCV0 LD L,19 ; SCREEN COL 19
01810 RCV1 LD B,2 ; FUNCTION # 2
01820 IN A,(235) ; RECIEVER PORT
01830 CP 127 ; END OF TRANSMISSION ?
01840 JP Z,SETCOM ; ERASE COMMAND LINE
01850 CP 13 ; IS IT A <CR> ?
01860 JR Z,XLINE ; DO A LINE FEED
01870 LD C,A ; CHARACTER INTO C
01880 CALL KWAIT ; TEST FOR KEY DEPRESS
01890 LD A,15 ; SVC # 15,@VDCTL
01900 RST 28H ; DISPLAY CHARACTER
01910 LD A,17 ; SEND HANDSHAKE CHAR
01920 OUT (235),A ; TO MODEL 100
01930 CALL WAIT ; WAIT FOR ACKNOWLEDGE
01940 INC L ; NEXT COL
01950 LD A,L ; CHECK FOR
01960 CP 59 ; END OF WINDOW
01970 JR Z,BMPLNE ; END OF LINE
01980 JR RCV1 ; LOOP IF NOOT
01990 LD A,17 ; SEND HANDSHAKE CHAR
02000 OUT (235),A ; TO MODEL 100
02010 CALL WAIT ; WAIT FOR ACKNOWLEDGE
02020 BMPLNE INC H ; START NEW LINE
02030 LD A,H ; CHECK FOR

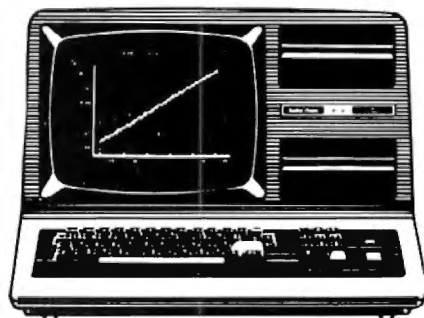
```

Listing 2 continued

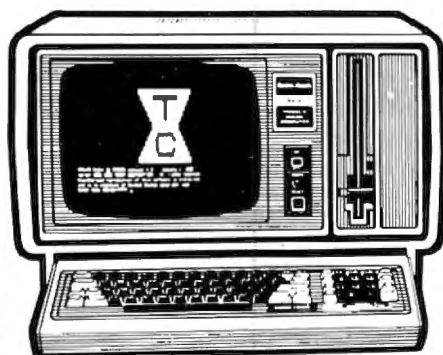
NOCONA

ELECTRONICS

MODEL 4D



MODEL 6000



MODEL 1000



NEW 512K MOD 3000 W/20 MEG HD. . . .2499.00

256K MOD 2000 W/MONO MONITOR . . .	1019.00	512K MOD 3000	1819.00
256K MOD 2000 W/COLOR MONITOR . . .	1299.00	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	585.00
128K MOD 1000 W/COLOR 2 DR.	1099.00	DMP 2100P PRINTER	1019.00
256K MOD 1000 W/10 MEG HD	1439.00	DWP 220 PRINTER	329.00
24K MOD 100 PORT	399.00	DWP 510 PRINTER	999.00
24K MOD 200 PORT	679.00	TRACTOR DWP 220	99.00
NEW MOD 600 PORT	1149.00	TRACTOR DWP II/510	159.00
64K MOD 4D 2DR.	839.00	TRACTOR FEED DMP2100P	99.00
512K MOD 6000 W/15 MEG HD	2579.00	PARALLEL PRINTER SWITCH	96.00
15 MEG HARD DISK	1119.00	PARALLEL PRINTER CONTROLLER	179.00
35 MEG HARD DISK	2059.00	70 MEG HARD DISK	2799.00

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

Listing 2 continued

```

02040 CP 16 ; LAST WINDOW LINE
02050 JR % ,SCROLL ; SCROLL DISPLAY
02060 JR RCV0 ; GET NEXT CHARACTER
02070 LD B,17 ; HORN BIT SUM
02080 PROMPT LD A,104 ; SVC # 104, @SOUND
02090 RST 28H ; BEEP THE HORN
02100 JP SETCOM ; READY COMMAND LINE
02110 CLOWIN LD IX,SCRBUF ; START OF SCRBUF
02120 LD B,7 ; SCREEN ROW 7
02130 CLOSE2 LD L,17 ; SCREEN COL 17
02140 CLOSE1 LD A,15 ; SVC# 15, @VDCTL
02150 LC B,2 ; FUNCTION # 2
02160 LD C,(IX+0) ; BUFF CHAR INTO C
02170 RST 28H ; REDISPLAY CHAR
02180 INC IX ; BUMP BUFF PTR
02190 INC L ; NEXT COL
02200 LD A,L ; CHECK FOR
02210 CP 60 ; END OF LINE
02220 JR NZ,CLOSE1 ; LOOP IF NOT
02230 INC H ; NEXT ROW
02240 LD A,H ; CHECK FOR
02250 CP 18 ; END OF WINDOW
02260 JR NZ,CLOSE2 ; LOOP IF NOT
02270 LD A,2 ; SVC # 2
02280 LD C,15 ; CURSOR OFF
02290 RST 28H ; DISPLAY IT
02300 BACK AF ; RESTORE REGISTERS
02310 POP BC ;
02320 POP DE ;
02330 POP HL ;
02340 POP IX ;
02350 RET ;
02360 WAIT IN A,(235) ; BACK TO APPLICATION
02370 CP 19 ; CHECK FOR MODEL 100
02380 JR NZ,WAIT ; HANDSHAKE CHARACTER ?
02390 WAIT1 IN A,(235) ; WAIT UNTIL IT ARRIVES
02400 CP 19 ; CHECK FOR RECIEVED DATA
02410 JR Z,WAIT1 ; HANDSHAKE REPLACED ?
02420 RET ; WAIT IF NOT
02430 SCROLL LD H,9 ; NEW CHAR IN RECIEVER
02440 SCROLL1 LD L,19 ; SCREEN ROW 9
02450 SCROLL2 LD A,15 ; SCREEN COL 19
02460 LD B,1 ; SVC # 15 @VDCTL
02470 RST 28H ; FUNCTION # 1
02480 LD C,A ; READ CHARACTER
02490 CALL KWAIT ; TRANFER TO C REG
02500 LD A,15 ; TEST FOR KEY PRESS
02510 LD B,2 ; SVC # 15 @VDCTL
02520 DEC H ; FUNCTION # 2
02530 RST 28H ; POINT TO HIGHER ROW
02540 INC L ; MOVE CHARACTER
02550 LD A,L ; NEXT COL
02560 CP 59 ; CHECK FOR
02570 JR Z,NXTLNE ; END OF ROW
02580 INC H ; GET NEXT ROW
02590 JR SCROLL2 ; RETURN FOR NEXT CHAR
02600 NXTLNE INC H ; GET NEXT COL CHAR
02610 INC H ; POSITION FOR
02620 LD A,H ; NEXT ROW TRANSFER
02630 CP 16 ; CHECK FOR END OF
02640 JR NZ,SCROLL1 ; LAST ROW
02650 BLKLN LD L,19 ; LOOP IF NOT
02660 DEC H ; SCREEN COL 19
02670 BLKLN1 LD A,15 ; ADJUST TO LAST ROW
02680 LD B,2 ; SVC # 15 @VDCTL
02690 LD C,32 ; FUNCTION # 2
02700 RST 28H ; BLANK SPACE
02710 INC L ; DISPLAY IT
02720 LD A,L ; GET NEXT COL
02730 CP 59 ; CHECK FOR
02740 JR NZ,BLKLN1 ; END OF ROW
02750 LD A,15 ; LOOP IF NOT
; SVC # 15, @VDCTL

```

Listing 2 continued

Circle 324 on Reader Service card.



Owners of
Pel-Tek's
Word Machine 3.0

Word Processor will testify to its ease of use. (Judge the 4-star review in July '85 80 Micro!). Pel-Tek has now improved the Word Machine, implemented it on the Model 4, and has created the easiest-to-use, most practical, functional and economical word processor available for the Model 4.

Pel-Tek

P.O. Box 1026 • Southampton, PA 18966
1-800-523-2445 (Ext. 19)
In Pa. 1-800-346-7511 (Ext. 19)

FREE with purchase:
"Wheels and Fortunes"
just like the TV Show
(on Disk — up to 3 players)

for Models 4/4p TRS DOS 6.2

Finally!!
Pel-Tek's

word machine 4.0
(for the TRS-80 Model 4)

Has Arrived!!!

only \$39.95

(add \$2.00 postage and handling)

Word Machine 4.0 features include:

- Full use of 80 x 24 screen
- Embedded forms controls to skip lines, eject paper, justify text
- Chain files together to print text of any virtual length
- Pause feature — Enter data into text during printout — great for forms or form letters
- Embed Ascii codes to control your printer
- Full screen editing
- Paragraph reformatting
- Headers, footers, and page numbering
- Multiple Help Screens - no manual needed
- Over 50 user definable Macro keys - insert full lines of text or printer codes with a single keystroke
- And more . . .

Back Issues



Jan. 1980 to June 1980 . . . \$3.00 each
July 1980 to May 1983 . . . \$3.50 each
June 1983 to present . . . \$4.50 each
Add \$1.00 per magazine for shipping.
10 or more magazines add \$7.50 per order for shipping.

80Micro

Back Issue Order Dept.
80 Pine Street

Peterborough, NH 02915

Listing 2 continued

```

02760 LD H,15 ; SCREEN ROW 15
02770 JP RCV0 ; GET NEXT XMIT CHAR
02780 KWAIT LD A,8 ; SVC # 8
02790 RST 28H ; POLL KEYBRD/RETURN
02800 CP 96 ; IS <SHIFT><E> PRESSED ?
02810 CALL 2,KHALT ; HALT TRANSMISSION
02820 RET ; RETURN TO LOOP
02830 KHALT LD A,1 ; SVC #1
02840 RST 28H ; POLL KEYBRD/WAIT
02850 CP 0 ; WAIT FOR NEXT KEY
02860 RET NZ ; THEN RETURN TO LOOP
02870 JR KHALT ; ELSE LOOP AND WAIT
02880 END INETALL

```

End

Program Listing 3. MSTRIO.BA

```

10 ***** MODEL 100 - MSTRIO.BA *****
20 CLEAR 300:POWER COMT
30 CLS:PRINT"SIDEPORT I/O DRIVER
ACTIVE..":MAIFILES=4
40 OPEN"COM:97E1D" FOR INPUT AS 1
50 OPEN"COM:97E1D" FOR OUTPUT AS 2
60 ON ERROR GOTO 300
70 PRINT#2,CHR$(19);CHR$(127);
80 AS=INPUT$(1,1)
90 IF AS=">" THEN BEEP:PRINT#2,CHR$(42)
;:GOTO 80
100 IF AS<>CHR$(13) THEN BS=B$+A$:
GOTO 80
110 IF BS="CLOSE PAD" OR BS="close pad"
THEN CLOSE 4:PRINT:PRINT"Notepad
closed..":GOSUB 250:NP=0:GOTO 170
120 IF NP=1 THEN PRINT#4,B$+CHR$(13)+
CHR$(10);:PRINT BS:GOSUB 250:GOTO 170
130 IF BS="OPEN PAD"OR BS="open pad"
THEN OPEN"NPAD.DO"FOR APPEND AS
4:PRINT:PRINT"Notepad open..":GOSUB
250:NP=1:GOTO 170
140 IF BS="DIR" OR BS="dir" THEN
CLS:PRINT:PRINT"===== SIDEPORT
DIRECTORY =====":PRINT:FILES:
PRINT:PRINT"Time: ",TIME$:TAB(25);"Date:
",DATE$:GOSUB 250:GOTO 170
150 IF RIGHT$(BS,3)=".DO" THEN OPEN BS
FOR INPUT AS 3:CLS:GOSUB 250:GOSUB
180:GOTO 170
160 IF RIGHTS(BS,3)=".BA"THEN LOAD BS,R
170 BS="":PRINT#2,CHR$(19);CHR$(127)
;:BEEP:GOTO 80
180 PRINT#2,CHR$(19);
190 Z$=INPUT$(1,3)
200 IF EOF(3) THEN PRINT#2,CHR$(127)
;:CLOSE 3:GOTO 250
210 IF Z$=CHR$(10) THEN 180
220 PRINT#2,Z$:GOSUB 230:GOTO 190
230 P$=INPUT$(1,1):IF P$<>CHR$(17)
THEN 230
240 PRINT#2,CHR$(19);:RETURN
250 PRINT#2,CHR$(19);
260 FOR J=65024 TO 65343
270 PRINT#2,CHR$(PEEK(J));:GOSUB 230
280 NEXT
290 :PRINT#2,CHR$(19);CHR$(127);:RETURN
300 PRINT#240,"PROGRAM ERROR";ERR;"IN
LINE";ERL;BEEP:GOSUB 250:BS="":CLOSE
3:CLOSE 4:RESUME 80

```

End

Program Listing 4. CALC.BA

```

10 *****
20 ** Model 100 - CALC.BA
30 ** Basic I/O Demonstration
40 *****
50 CLS:ON ERROR GOTO 290:T1=0:CA$="":
PRINT#160,"CALCULATOR READY..":PRINT:
PRINT "Enter: Number + - * / Number":
GOSUB 250:PRINT#2,CHR$(127);
60 C$=INPUT$(1,1)
70 IF C$="+-" OR C$="-"OR C$="*" OR C$="/"
" THEN 110
80 IF C$="0" THEN LOAD"MSTRIO.BA",R
90 IF C$="=" OR C$=CHR$(13) THEN 120
100 IF C$<"0" OR C$>"9" THEN 60
110 CA$=CA$+C$:GOTO 60
120 FOR JL=1 TO LEN(CA$)
130 T$=MID$(CA$,JL,1)
140 IF T$="+" THEN T1=1:GOSUB 240
150 IF T$="-" THEN T1=2:GOSUB 240
160 IF T$="*" THEN T1=3:GOSUB 240
170 IF T$="/" THEN T1=4:GOSUB 240
180 NEXT
190 IF T1=1 THEN N3=N1+N2:PRINT:PRINT
N1,"+",N2,"=";N3;
200 IF T1=2 THEN N3=(N1-N2):PRINT:PRINT
N1,"-",N2,"=";N3;
210 IF T1=3 THEN N3=N1*N2:PRINT:PRINT
N1,"*",N2,"=";N3;
220 IF T1=4 THEN N3=N1/N2:PRINT:PRINT
N1,"/",N2,"=";N3;
230 GOSUB 250:GOTO 50
240 N1=VAL(LEFT$(CA$,JL-1)):N2=VAL(
RIGHT$(CA$,LEN(CA$)-JL)):RETURN
250 PRINT #2,CHR$(19);
260 FOR J=65024 TO 65343:PRINT#2,CHR$(
PEEK(J));:GOSUB 270:NEXT:BEEP:RETURN
270 P$=INPUT$(1,1):IF P$<>CHR$(17)
THEN 270
280 PRINT #2,CHR$(19);:RETURN
290 PRINT:PRINT"PROGRAM ERROR";ERR;"IN
LINE";ERL;:GOSUB 250:RESUME 50

```

End

This Publication is available in Microform.



University Microfilms
International

Please send additional information

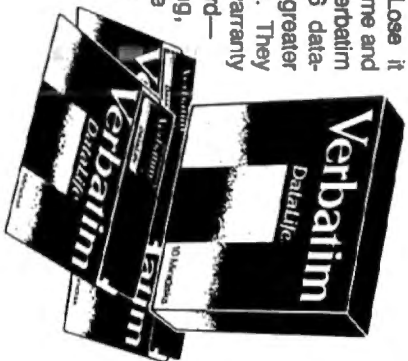
Name _____
Institution _____
Street _____
City _____
State _____ Zip _____

300 North Zeeb Road
Dept. P.R.
Ann Arbor, Mi. 48106

Circle 361 on Reader Service card.

Verbatim Datatlife

Preserving your data is
vitaly important. Lose it
and you've lost both time and
money. That's why Verbatim
Datatlife Diskettes have 6 data-
shielding improvements for greater
disk durability and longer life. They
come standard with a lifetime warranty—
that establishes the industry standard—
it guarantees trouble-free recording,
storage, and retrieval. And to help introduce
you to the Verbatim quality standard we're
running a special offer on many of their pro-
ducts, including—Datatlife Diskettes, Cleaning
Kits, and Disk Drive Analyzers.



What separates us from our competition? Simply a combination of the best service
in the industry, highly competitive pricing, and an ever widening range of products.
Above all we care about our reputation and we are willing to work on a lower margin
while delivering what others only claim—and we do it all on a day-in day-out basis.

Early in 1986 every subscriber to **80
Micro** will receive our New 1986 First
Edition Catalog with 16 additional
pages and dramatically lower pricing.
We want to be your source for com-
puter supplies and accessories.

Lybren Computer Systems

WATCH
FOR
OUR

NEW 1986
CATALOG

1050 E. MAPLE RD. • TROY, MI 48063

(313) 589-3440

Listing continued from p. 52

```

1610 TOPIC.NAME$(I) = TOPIC.NAME$(I+1)
1620 TOPIC.LOC$(I) = TOPIC.LOC$(I+1)
1630 NEXT I
1640 TOPIC.NAME$(TOPIC.COUNT) = "": TOPIC.LOC$(TOPIC.COUNT) = 0:
TOPIC.COUNT = TOPIC.COUNT - 1
1650 NEXT.TEXT = TOPIC.PTR: ' Second, find next closest text ptr
1660 FOR I = 1 TO TOPIC.COUNT
1670 IF (TOPIC.LOC$(I)>DEL.TOPIC%)AND(TOPIC.LOC$(I)<NEXT.TEXT) THEN
NEXT.TEXT = TOPIC.LOC$(I)
1680 NEXT I
1690 FOR I = 1 TO TOPIC.COUNT: ' adjust the text pointers that move
1700 IF (TOPIC.LOC$(I)>DEL.TOPIC%) THEN TOPIC.LOC$(I) = TOPIC.LOC$(I) -
(NEXT.TEXT - DEL.TOPIC%)
1710 NEXT I
1720 OPEN "r",2,"hlptmp/tmp:2",1: FIELD 2, 1 AS HT$: ' move text data in file
1730 I = 1
1740 FOR J = NEXT.TEXT TO TEXT.END
1750 GET 1,J: LSET HT$=H$: PUT 2,I: I = I + 1
1760 NEXT J
1770 TEXT.END = TEXT.END - (NEXT.TEXT - DEL.TOPIC%):I = 1
1780 FOR J = DEL.TOPIC% TO TEXT.END
1790 GET 2,I: LSET H$ = HT$: PUT 1,J: I = I + 1
1800 NEXT J
1810 TOPIC.PTR = TEXT.END + 1
1820 CLOSE 2
1830 KILL "hlptmp/tmp:2"
1840 RETURN
1850 '-----
1860 ' This routine handles the addition of a topic to the Help File.
1870 '-----
1880 INPUT"What is the name of the topic you wish to add ";TEMP$
1890 IF LEN(TEMP$)>32 OR LEN(TEMP$)<2 THEN 1880
1900 FOR I = 1 TO LEN(TEMP$): ' Convert to upper case
1910 CH$ = MID$(TEMP$,I,1)
1920 IF (CH$ >= "a" AND CH$ <= "z") THEN MID$(TEMP$,I,1) =
CHR$(ASC(CH$)-32)
1930 NEXT I
1940 FOR I = 1 TO TOPIC.COUNT: ' add topic name to topic arrays
1950 IF TOPIC.NAME$(I) = TEMP$ THEN PRINT"Topic already exists":
FOR I=1 TO 3000:NEXT I:RETURN
1960 IF TOPIC.NAME$(I) > TEMP$ THEN 1980
1970 NEXT I
1980 IF I > TOPIC.COUNT THEN 2040
1990 FOR J = (TOPIC.COUNT + 1) TO (I+1) STEP -1
2000 TOPIC.NAME$(J) = TOPIC.NAME$(J-1)
2010 TOPIC.LOC$(J) = TOPIC.LOC$(J-1)
2020 NEXT J
2030 IF I=0 THEN I=1
2040 TOPIC.NAME$(I) = TEMP$: TOPIC.LOC$(I) = TEXT.END + 1
2050 TOPIC.COUNT = TOPIC.COUNT + 1
2060 INVERSE = -1: CTR = 0: CLS:PRINT"Please Enter Text Now":
PRINT""To toggle inverse video, use the \ character. To Quit, use @":PRINT
CTR = CTR + 1: TXT.BUFF$(CTR) = "": PRINT CTR;" ";
2070 LINE INPUT TXT.BUFF$(CTR)
2080 IF INSTR(TXT.BUFF$(CTR)) = "0" THEN 2120: ' quit
2090 IF INSTR(TXT.BUFF$(CTR),"\"") THEN
MID$(TXT.BUFF$(CTR),INSTR(TXT.BUFF$(CTR),"\"),1) = CHR$(127):
INVERSE = NOT INVERSE: GOTO 2100
2110 TXT.BUFF$(CTR) = TXT.BUFF$(CTR) + CHR$(13): GOTO 2070
2120 IF NOT INVERSE THEN
TXT.BUFF$(CTR-1) = LEFT$(TXT.BUFF$(CTR-1),LEN(TXT.BUFF$(CTR-1))-1) +
CHR$(127) + CHR$(13)
2130 TXT.BUFF$(CTR) = CHR$(12): ' hex '0C' to mark end of text
2140 FOR I = 1 TO CTR: ' put the text into file
2150 FOR J = 1 TO LEN(TXT.BUFF$(I))
2160 LSET H$ = MID$(TXT.BUFF$(I),J,1)
2170 PUT 1,TEXT.END + 1
2180 TEXT.END = TEXT.END + 1
2190 NEXT J
2200 NEXT I
2210 TOPIC.PTR = TEXT.END + 1
2220 RETURN
2230 '-----
2240 ' This routine handles an update topic request. Note that the topic
2250 ' is placed into a buffer to edit, is deleted from the file, edited, and

```

Listing continues

Circle 146 on Reader Service card.

How To Fill the Terminal Emulation Gap in the Micro to Mainframe World?

Use TELETERM to turn your micro into a multi-user workstation... or as a terminal into most systems.

Does Any Other Terminal Emulation Product Have All Of These Features?

- Communicates at 9600 Baud
- Supports Terminal Emulations of: DEC VT100, VT52, VT102, LSI, Wyse, Televideo, IBM 3101 Mod 10 & others
- User May Configure Own Emulations
- Easy Installation
- Powerful Unattended Operation
- Macros
- Xmodem File Transfer Protocol
- TELETERM Proprietary Protocol for Micro-to-Micro File Transfer
- File Upload/Download Directly to/from disk
- Full Screen Text Editor
- User Defined Keyboard Mapping
- Character Conversion Capability
- Unlimited System Configurations
- XON/XOFF Flow Control Protocol
- Full/Half Duplex
- Automatic Logon and Logout
- Autodial, Auto Redial, Auto Answer and Hangup Modem Support
- Phone Number Directory for Auto Dialing
- Supports Remote Printing
- Supports Answerback
- Supports Horizontal Windows
- Split Window Conversational Mode
- Supports Real-Time Clock
- Supports Line Graphics
- Supports Hard-Wired Operation
- Execute DOS Commands and Applications from within TELETERM
- MSDOS & TRSDOS Versions Available

As simple as ABC for use by the novice with our preconfigured emulation files... yet gives the professional the power of configuring any or all of the above capabilities... and MORE.

Use as a DEC VT100, VT52, or VT102 terminal emulator to:

- Communicate with a DEC VAX, Microvax, or other DEC Computer;
- Communicate with UNIX/XENIX systems;
- Communicate with IBM, Sperry, Burroughs and other synchronous mainframes through protocol converters;
- Or use our other emulations to talk to other systems.

Solve your communications problems with the most powerful and flexible terminal emulation product available... TELETERM... call or write us for information about TELETERM and our UNIX/XENIX multi-user products.

TELEEXPRESS, INC.

Rt. 130 & Beverly-Ranococas Rd., PO Box 217
 Willingboro, NJ 08046
 (609) 877-4900

Listing continued

```

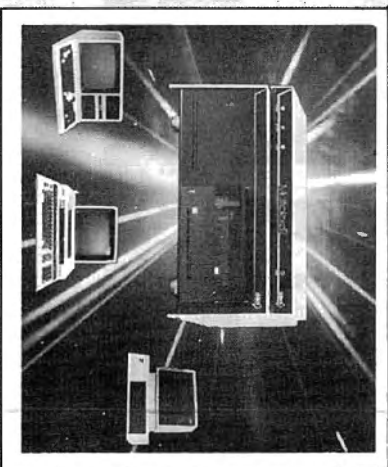
2260 ' then placed back into the file as an add.
2270 '-----
2280 TXT.COUNT = 0
2290 INPUT "What is the name of the topic that you wish to Update ";TEMP$
2300 FOR I = 1 TO LEN(TEMP$): ' Convert to upper case
2310 CH$ = MID$(TEMP$,I,1)
2320 IF (CH$ >= "a" AND CH$ <= "z") THEN
      MID$(TEMP$,I,1) = CHR$(ASC(CH$)-32)
2330 NEXT I
2340 FOUND = 0: CTR = 1: ' Find the topic in the list
2350 WHILE ((FOUND = 0) AND (CTR <= TOPIC.COUNT))
2360 IF TOPIC.NAME$(CTR) = TEMP$ THEN FOUND = 1 ELSE CTR = CTR + 1
2370 WEND
2380 IF CTR > TOPIC.COUNT THEN PRINT "Requested topic is not in current file":
      FOR I = 1 TO 3000:NEXT I: RETURN
2390 PRINT "Preparing Text for Edit..."
2400 ED.NAME$ = TEMP$:TEMP$ = " ":FPOS = TOPIC.LOC$(CTR): TXT.COUNT = 0:
      FLAG = 0
2410 WHILE (ASC(TEMP$) <> 12): ' Copy text from file to txt.buff buffer
2420 TEMP$ = " "
2430 TXT.COUNT = TXT.COUNT + 1
2440 IF FLAG = 0 THEN TXT.BUFF$(TXT.COUNT) = " "
      ELSE TXT.BUFF$(TXT.COUNT) = " "
2450 FLAG = 0
2460 WHILE ((TEMP$ <> CHR$(12)) AND (TEMP$ <> CHR$(13)))
2470 GET 1,FPOS: FPOS = FPOS + 1
2480 IF ((ASC(H$) AND 128) <> 0) THEN TEMP$ = CHR$(ASC(H$)-128):FLAG=1
      ELSE TEMP$ = H$
2490 IF ((TEMP$ = CHR$(13)) OR (TEMP$ = CHR$(12))) THEN 2530
2500 IF (TEMP$ = CHR$(127)) THEN TEMP$ = " "
2510 TXT.BUFF$(TXT.COUNT) = TXT.BUFF$(TXT.COUNT) + TEMP$
2520 IF ((FLAG = 1) AND (TEMP$ <> CHR$(13))) THEN
      TXT.BUFF$(TXT.COUNT) = TXT.BUFF$(TXT.COUNT) + " ": FLAG = 0
2530 WEND
2540 WEND
2550 GOSUB 1590: ' into delete routine to delete topic at posn ctr
2560 GOSUB 2840: ' Edit the buffer routine
2570 INVERSE = -1
2580 FOR I = 1 TO TXT.COUNT
2590 IF INSTR(TXT.BUFF$(I),"\") THEN
      MID$(TXT.BUFF$(I),INSTR(TXT.BUFF$(I),"\"),1) = CHR$(127):
      INVERSE = NOT INVERSE: GOTO 2590
2600 TXT.BUFF$(I) = TXT.BUFF$(I) + CHR$(13)
2610 NEXT I
2620 IF NOT INVERSE THEN
      TXT.BUFF$(I-1) = LEFT$(TXT.BUFF$(I-1),LEN(TXT.BUFF$(I-1))-1) +
      CHR$(127) + CHR$(13)
2630 TXT.BUFF$(I) = CHR$(12): ' Mark end of text
2640 TXT.COUNT = I: CTR = TXT.COUNT: ED.TXTPTR = TEXT.END + 1
2650 PRINT "Updating Help Information..."
2660 GOSUB 2140: ' Inside the add routine to load file
2670 FOR I = 1 TO TOPIC.COUNT: ' Add name back in topic arrays
2680 IF TOPIC.NAME$(I) = ED.NAME$ THEN STOP
2690 IF TOPIC.NAME$(I) > ED.NAME$ THEN 2710
2700 NEXT I
2710 IF I > TOPIC.COUNT THEN 2760
2720 FOR J = (TOPIC.COUNT + 1) TO (I + 1) STEP -1
2730 TOPIC.NAME$(J) = TOPIC.NAME$(J-1)
2740 TOPIC.LOC$(J) = TOPIC.LOC$(J-1)
2750 NEXT J
2760 TOPIC.NAME$(I) = ED.NAME$: TOPIC.COUNT = TOPIC.COUNT + 1
2770 TOPIC.LOC$(I) = ED.TXTPTR
2780 TEXT.COUNT = 0
2790 RETURN
2800 '-----
2810 ' This routine allows the user to do a minimal form of line-oriented
2820 ' editing of the txt.buff$ array, to edit a help topic.
2830 '-----
2840 IF TXT.COUNT = 0 THEN PRINT "No Text in Buffer to Edit ":FOR I=1 TO 2000:
      NEXT I: RETURN
2850 CHOICES$ = " "
2860 WHILE ((CHOICES$ <> "Q") AND (CHOICES$ <> "q"))
2870 CLS: PRINT "HelpMate - Text Editor": PRINT:PRINT
2880 PRINT "Editor Options Available : ":PRINT
2890 PRINT TAB(10);"L List Lines on screen"
2900 PRINT TAB(10);"I Insert Lines"

```

Listing continue

Circle 300 on Reader Service card.

The Bi-Tech Hard Disk Drives



& Star
Able to link 8 computers to a
Network Hard Drive System

- RADIO SHACK MODEL FEATURES:**
- 10 Megabyte Removable Cartridge
 - 10-60 Megabytes Drive
 - Multiple Operating System Segments
 - Variable Segment Size Capability
- MODEL 1/11/1/4 SYSTEMS —**
- DosPlus 3.5 & DosPlus 4
 - Ddos 5.1
 - TRSDOS 6
 - CP/M — Hard Disk Support
- MODEL 1/1/1/2 SYSTEMS —**
- DP 11
 - TRSDOS 2.0 with Racer! HSDS
 - CP/M — Hard Disk Support
- MODEL 1/6 —**
- Xenix Support
- MODEL 1000/1200/2000 —**
- MS-DOS, PC-DOS

IBM PC, XT, AT • Compaq • AT&T 6300 • Columbia • Corona • Eagle • TI Professional • Zenith • Televideo & IBM Compatibles
Tandy Models I, II/4, 212/16, 1000, 1200, Xenix
Epson OX-10/16, Equity I, II, III • NEC APC III

* * 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
 - Flip Top Case
 - 135 Watt Supply
 - 8 Card Slots (6 unused/5 XT)
- Monochrome & Color Monitors available

Complete 10meg- mono system \$1495.

Tandy 1000/1200

Internal Hard Disk Upgrade Kits

- Includes: Controller, Drive, Cables & Manual
- 10 meg \$ 495.00
 - 20 meg \$ 625.00

INTRODUCING... The New Economy Line of Bi-Tech Hard Drive Systems

Sizes:

- 10-40 Meg Fixed
- 10 Meg Removable Cartridge
- 60 Meg Streaming Tape Backup

as low as \$1295.00 for external systems



B. T. Enterprises
10 Cornough Road
Bohemia, NY 11716-2906
(516) 557-8156 (800) 545-1165
All prices shown include 2" x 4" cash discount.
Add \$4.00 shipping & handling on all ordered orders.
Minimum 30 day advance notice for cancellations & returning O.D. orders.
Manufacturer's Visa

REFER TO DEPT. 1 E

Listing continued

```
2910 PRINT TAB(10);"D Delete Lines"
2920 PRINT TAB(10);"E Edit a line"
2930 PRINT TAB(10);"R Replace lines"
2940 PRINT TAB(10);"Q Quit Editing, Save text to Help File"
2950 PRINT
2960 PRINT "There are currently ";TXT.COUNT;" lines of text.":INPUT "Command ";
CHOICES
2970 IF {(CHOICES="L") OR (CHOICES="l")} THEN GOSUB 3080:GOTO 2960
2980 IF {(CHOICES="I") OR (CHOICES="i")} THEN GOSUB 3160:GOTO 2960
2990 IF {(CHOICES="D") OR (CHOICES="d")} THEN GOSUB 3330:GOTO 2960
3000 IF {(CHOICES="E") OR (CHOICES="e")} THEN GOSUB 3440:GOTO 2960
3010 IF {(CHOICES="R") OR (CHOICES="r")} THEN GOSUB 3560:GOTO 2960
3020 IF {(CHOICES"<"q") AND (CHOICES"<"Q")} THEN GOTO 3030
3030 WEND
3040 RETURN : '** Done Editing text, now finish the file update
3050 '-----
3060 ' Editor List function
3070 '-----
3080 INPUT "Please Enter the range of lines to List (start,end) ";START,LEND
3090 FOR I = START TO LEND
3100 IF (I <= TXT.COUNT) THEN PRINT I;"> ";TXT.BUFF$(I) ELSE RETURN
3110 NEXT I
3120 RETURN
3130 '-----
3140 ' Editor Insert Function
3150 '-----
3160 INPUT "Please Enter the Line Number to start Inserting at (Start) ";START
3170 PRINT "Begin entering text at the prompt, to quit, enter a single line";
3180 PRINT " with the @ character."
3190 PRINT START;"> ";
3200 LINE INPUT TEXT$
3210 IF TEXT$="@" THEN RETURN
3220 IF START > TXT.COUNT THEN 3260
3230 FOR I = TXT.COUNT TO START STEP -1
3240 TXT.BUFF$(I+1) = TXT.BUFF$(I)
3250 NEXT I
3260 TXT.BUFF$(START) = TEXT$
3270 IF START > TXT.COUNT THEN TXT.COUNT = START ELSE TXT.COUNT = TXT.COUNT+1
3280 START = START + 1
3290 GOTO 3190
3300 '-----
3310 ' Editor Delete Function
3320 '-----
3330 INPUT "Please enter the range of lines to delete (start,end) ";START,LEND
3340 IF LEND < START THEN 3330
3350 IF LEND > TXT.COUNT THEN LEND = TXT.COUNT
3360 FOR I = (LEND + 1) TO TXT.COUNT
3370 TXT.BUFF$(I-(LEND+1-START)) = TXT.BUFF$(I)
3380 NEXT I
3390 TXT.COUNT = TXT.COUNT - (LEND - START) - 1
3400 RETURN
3410 '-----
3420 ' Editor Edit Line Function
3430 '-----
3440 INPUT "Please Enter the Line Number that you wish to Edit "; START
3450 PRINT "Contents: ";PRINT START;"> ";TXT.BUFF$(START)
3460 LINE INPUT "Please enter Source String for change or @ to quit > ";SOURCES$
3470 IF SOURCES$="@" THEN RETURN
3480 LINE INPUT "Please enter the Replacement String > ";REPLSTR$
3490 PTR = INSTR(TXT.BUFF$(START),SOURCES$)
3500 IF PTR = 0 THEN PRINT "Source string not found": GOTO 3450
3510 TXT.BUFF$(START) = LEFT$(TXT.BUFF$(START),PTR-1) + REPLSTR$ + RIGHT$(
TXT.BUFF$(START),LEN(TXT.BUFF$(START))-(PTR+LEN(SOURCES)-1))
3520 GOTO 3450
3530 '-----
3540 ' Editor Replace Line Function
3550 '-----
3560 INPUT "Please enter the starting line number to begin replacing ";START
3570 PRINT "Enter a Line containing only the @ character to quit "
3580 PRINT START;"old> ";TXT.BUFF$(START)
3590 PRINT START;"new> ";LINE INPUT TEXT$
3600 IF TEXT$ = "@" THEN RETURN
3610 TXT.BUFF$(START) = TEXT$
3620 START = START + 1
3630 GOTO 3580
3640 '-----
```

Listing continued

Circle 36 on Reader Service card.

COPYCAT 4.1

THE MOST POWERFUL DISK COPY UTILITY

COPYCAT 4.1 will allow you to duplicate virtually all of your TRS-80 diskettes even if it is protected. COPYCAT 4.1 will automatically analyze, format, copy and verify each track of the diskette you are copying. The entire process is typically less than 70 seconds for a single sided 40 track disk.

COPYCAT 4.1 can easily be configured for single or double sided diskettes, number of tracks to copy, which drives to use, step rate and to double step 80 track drives.

COPYCAT 4.1 for TRS-80 Model III, 4, 4D, 4P \$49.95

Add \$2.00 for Postage and Handling. California residents please add 6% sales tax. All orders are normally shipped within 24 hours via first class mail.

OMNISOFTE RESEARCH
2170 W. BROADWAY, #501
ANAHEIM, CA 92804
(714) 772-5000



Listing continued

```

3650 ' This routine is used to print a manual from the help file.
3660 CLS:PRINT:PRINT"Helpate - Manual Print";
3670 LPRINT UL.CHAROFFS; ' for dmp100
3680 PRINT:PRINT"Please position your paper to Top of Form and press <ENTER>";
TEXT$ = INKEY$:IF TEXT$ <> CHR$(13) THEN 3690
3690 PRINT:PRINT"there are ",TOPIC.COUNT," topics in this Help File."
3700 PRINT:PRINT"An Index will be generated."
3710 PRINT:PRINT"Printing...";
3720 PAGE.COUNT = 0: LINE.COUNT = 0
3730 ' Print the title Page
3740 '
3750 ' FOR I = 1 TO 28:LPRINT":NEXT I
3760 '
3770 LPRINT TAB(23);"TRS-80 Help Manual From File ";LEFT$(HELP.FILE$,
INSTR(HELP.FILES, "/"*)-1)
:PRINT:LPRINT TAB(20);"Generated By Helpate, Ver 1.0"
3800 LPRINT TAB(26);"
3810 GOSUB 4270: ' skip to next page
3820 CTR = 1
3830 WHILE (CTR <= TOPIC.COUNT)
3840 LPRINT":LPRINT":LINE.COUNT = LINE.COUNT + 2
3850 'UL.CHARONS;TOPIC.NAMES$(CTR);UL.CHAROFFS;LPRINT
"LINE.COUNT + 3
3860 IF LINE.COUNT > 56 THEN GOSUB 4270
3870 FPOS = TOPIC.LOC$(CTR)
3880 TOPIC.PAGE$(CTR) = PAGE.COUNT
3890 TEXT$ = "TEMP$ = " + TOPIC.PAGE$(CTR)
3900 WHILE (TEXT$ <> CHR$(12))
3910 TEXT$ = CHR$(12) + TEXT$
3920 FPOS = FPOS + 1
3930 IF TEXT$ = CHR$(12) THEN 4040
3940 IF (ASC(TEXT$) AND 128) <> 0 THEN TEXT$ = CHR$(ASC(TEXT$)-128):
FLAG = 1
3950 IF ( (TEXT$=CHR$(127)) AND (NOT UL.ON) ) THEN UL.ON = NOT UL.ON: TEXT$
= UL.CHARONS:GOTO 3980
3960 IF ( (TEXT$=CHR$(127)) AND (UL.ON) ) THEN UL.ON = NOT UL.ON: TEXT$ =
UL.CHAROFFS:GOTO 3980
3970 IF ( (TEXT$<>CHR$(13)) AND (FLAG = 1) ) THEN TEXT$ = TEXT$ + " ":FLAG
= 0
TEMP$ = TEMP$ + TEXT$
3980 IF TEXT$ <> CHR$(13) THEN 4040
4000 ' Must be a <cr>
4010 LPRINT LEFT$(TEMP$,LEN(TEMP$)-1);LINE.COUNT = LINE.COUNT + 1
4020 IF (FLAG = 1) THEN TEMP$ = " ":FLAG = 0 ELSE TEMP$=""
4030 IF LINE.COUNT > 56 THEN GOSUB 4270
4040 WEND
4050 CTR = CTR + 1
4060 WEND
4070 '
4080 ' Now print the index page
4090 '
4100 GOSUB 4270: ' force a new page"
4110 LPRINT TAB(31);"INDEX:LPRINT":LINE.COUNT = LINE.COUNT + 2
4120 FOR I = 1 TO TOPIC.COUNT
4130 LPRINT TAB(5);TOPIC.NAMES$(I);TAB(50);TOPIC.PAGE$(I)
4140 LINE.COUNT = LINE.COUNT + 1
4150 IF LINE.COUNT > 57 THEN GOSUB 4270:LPRINT TAB(31);"INDEX (Contd)":
LPRINT:LINE.COUNT = LINE.COUNT + 2
4160 NEXT I
4170 '
4180 ' All Done.... Skip to next page and quit
4190 '
4200 FOR I = LINES.PAGE TO LINE.COUNT STEP -1
4210 LPRINT"
4220 NEXT I
4230 PRINT"Print Complete.":FOR I = 1 TO 2000:NEXT I: RETURN
4240 '
4250 ' This routine skips to next page and prints page number
4260 '
4270 FOR I = LINES.PAGE-1 TO LINE.COUNT STEP -1
4280 LPRINT"
4290 NEXT I
4300 LPRINT:LPRINT TAB(50);"Page ";PAGE.COUNT + 1:LPRINT:LPRINT
4310 LINE.COUNT = 4: PAGE.COUNT = PAGE.COUNT + 1
4320 RETURN

```

Circle 439 on Reader Service card.

Circle 63 on Reader Service card.



WORD PROCESSOR

Stylus is a high speed word processor that is very responsive and easy to use. There are about 90 text commands or controls for advanced users, but beginners can correct simple text expertly using only two of them. These are <I> insert and <AW> wrap. Action repeats while any key like (W) or (I) is held down—and this saves typing! A slash command prefix key is ideal, because it is so easy to reach—a near miss on the familiar <SHIFT> key; <I/> types a text slash. (SHIFT) makes repetition faster. <AW>! typed quickly deletes one letter and wraps. If the (W) key is held down, perhaps with a (SHIFT) speedup, it can delete a lot of text quickly. Printing controls include graphics, three margins, form feeds, page numbers, headers, or multiple spacing, with automatic printing of long documents or multiple copies using more than one file. Visible printed text lines exactly match video display lines.

Stylus has uniquely powerful and extensive non-text features for utilities, graphics, animations, a BASIC statement screen compiler, and screen capturing. Utility features include scrolling hex dumps, undumps, searches, and verifications. All file types can be examined or modified. Graphics can be combined with text. All graphics functions are instantly active at the same time in one mode. There is Jot Stylus pixel drawing, defined line drawing, full screen motion, and Brush Stylus drawing—set an entire screen as a complex drawing "pixel" and then rapidly draw with it. There are many other instant action keys to flip, overlay, fill, invert, etc. Doodling with a sort of electronic kaleidoscope effect is easy to do.



BASIC PROGRAM ENHANCEMENTS

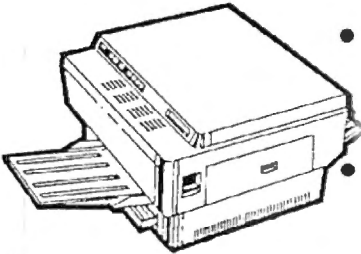
Elixir is a source of over 12000 bytes of machine language in a unique form—50 USR routines imbedded in Basic statements. The imbedded form of USR program provides the ultimate in speed to install, load, startup, run, and it saves memory. A Merge command and simple coding can put an Elixir routine to work to enhance your own Basic program. As a bonus there is a disk full of BASIC demo or application programs: disk file verifier, programs to create/compile/recapture program screens, text word counter, directory system, keyboard piano, hexadecimal utilities, and more. These make the package a good value for anyone at any level, programmer or not. It is child's play to make screens with text or graphics or large print, or to capture screens from other programs. Compiled screens save memory, too.

USR applications include extensive graphics, text, sound, printing, I/O for disk & screen & memory, keyboard menu control, hex utilities, capture program screens by break key, GOTO N, line address, animations, and more. Menu routines simplify program writing and maintenance, while speeding up the action and providing more free memory. Instant branching is by the touch of a menu <KEY>, using line and menu list <key> lists.

64K mod. 1, 3, 4 & 2 drives. 1 drive runs, but inquire first for copy service.
STYLUS \$64.50 ELIXIR \$39.50 send check or money order with \$2.00 P&H to:

Donald W. Ady
 56 Oak Ridge Avenue
 Summit, NJ 07801
 Inquiries (201) 277-3385 or SASE

TEXT PROCESSING: TOTAL SOLUTION!



- SofType Desktop Publishing System
- LEX Word Processing System
- SofType Desktop Publishing System
 - Typesetting direct from word processing
 - Integrated Graphics
 - Special fonts for laser printers (6-40 point)
 - Output from laser printers
 - *This entire ad produced with SofType!*
- LEX Word Processing System
 - The most complete word processor!
 - Easy to learn and use
 - 120,000 word spelling dictionary
 - Mass mailing/database with sorting
 - Calculator/math functions

SofTest Inc.
 555 Goffle Road, Ridgewood, N.J. 07450
 Phone: (201) 447-3901, Telex: 703593

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
GENie*	X	X	X	X	X	X	\$18.00	none	\$5.00	\$5.00
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. You'll receive FREE OF CHARGE—3 hours of non-prime time use—a \$15.00 value.

So why not Sign-Up today with this special offer, let GENie bring a little magic into your life!

3 FREE Hours When You Sign Up From Your Keyboard Before May 31st—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 5JM11966, 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.

Continued from p. 31

that 1dir is unprotected, so you can install it on as many disks as you want.

The display is sectioned off according to function, as you can see in Fig. 1. The program uses two cursors: a file cursor to point to and select files, and a command cursor for choosing command options from the menu at the bottom of the screen.

The directory block on the left of the screen lists the files and subdirectories contained on the current drive, fourteen at a time. You use the standard cursor-movement keys to scroll through the list. In Fig. 1, the name "1DIRDATA" in the upper-left corner of the screen represents the subdirectory being displayed. This line is blank if you are in the root directory. The first entry in the list, Previous DIR, means you are displaying a subdirectory.

You can search for a file by holding down the alternate key and typing in up to eight letters. The more characters you enter, the more specific the search becomes. The search starts as soon as you enter a character, and the file cursor moves to the closest match each time you add another letter.

The file list may be sorted by name, extension, size, or date; the default sort is by name.

The Statistics section of the 1dir display provides information about disk space and memory usage, along with the time and date.

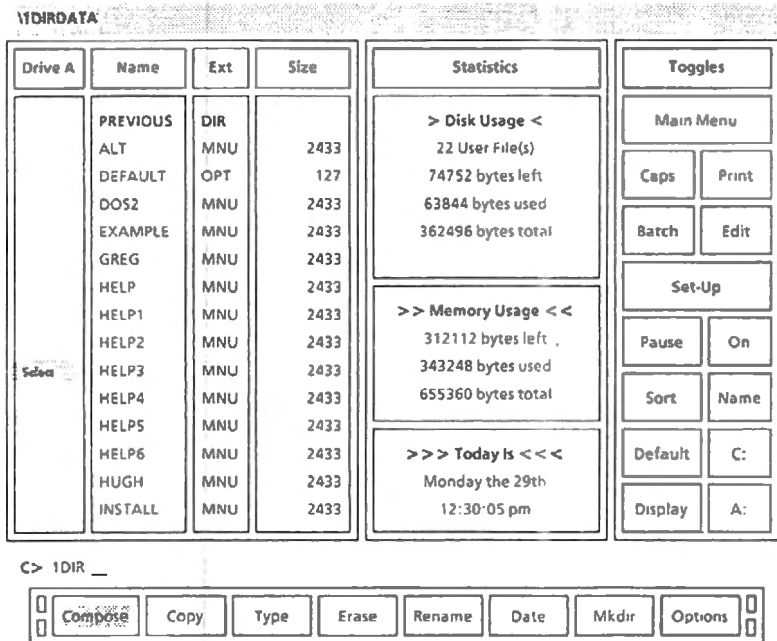
The Toggles section shows keyboard and program status in reverse video. In Fig. 1, "Main Menu" is the title of the command menu displayed along the bottom of the screen. The Batch indicator shows if the Batch Builder is in use. The Edit block tells you whether the function keys are in the DOS editing mode or under 1dir's control (the default). Under 1dir's control, the function keys are used for instant access, quick positioning, or menu building.

From the Set-up section, you can choose a sort, toggle 1dir's pause option on or off, change the drive being displayed, and get a directory of any drive. You press alternate-print to access this section, then use the up- and down-arrow keys to position the cursor over the appropriate block.

The Command section at the bottom of the display consists of eight boxes containing the menu commands currently in effect. Some menus are variable; that is, you can modify their commands. Others, like the main menu shown in Fig. 1, are fixed.

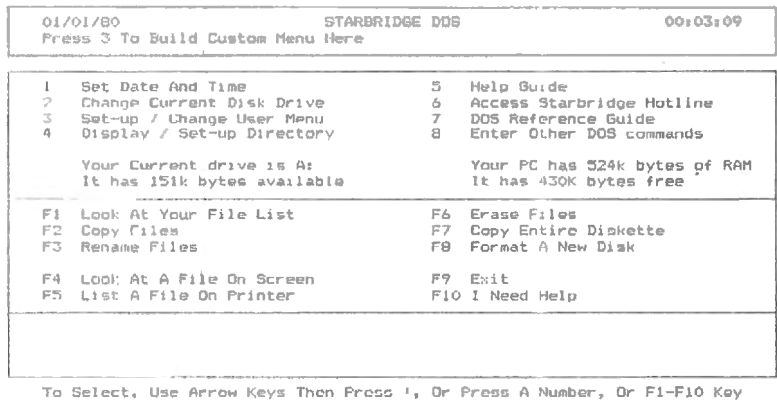
From the main menu, you can run, copy, list, delete, or rename files; make subdirectories; and build batch files. The Copy, Type, and Erase commands let

THE 1dir SCREEN DISPLAY



The 1DIR - Version 3 50 Copyright (c) Bourbaki, Inc. 1985

Figure 1. The 1dir menu.



To Select, Use Arrow Keys Then Press I, Or Press A Number, Or F1-F10 Key

Figure 2. The Starbridge menu.

you act on up to 64 files at once; you use the plus (+) and minus (-) characters to flag or unflag files for mass action.

To customize 1dir, you use the Options program, which allows you to change the pause and sort defaults and alter 1dir's screen display, menu options,

color settings, and so on. The program's help screens and README file lead you through the customizing process.

1dir's useful Menu and Command Builder features let you create or modify menus. You use the Menu Builder to copy, exchange, and delete commands

80 MICRO'S LIST of ADVERTISERS

Reader Service Number	Page	Reader Service Number	Page	Reader Service Number	Page			
72	Aerocomp	101	Toll Free	39, 41	440	Personal Integrated Computers	59	
82	Aerocomp	74, 75	University Micro	94, 105	538	Polygon Computers	140	
215	Aicor Systems	51	Electric Webster	19	108	Powersoft	61	
30	Allwrite	10	Envision Designs	155	308	Powersoft	4	
17	Alpha Products	13, 15	EPD Engineering	63	76	Producer, The	20	
374	ALPS	38	Four Star Software	125	449	Professor Jones/Frogg House	136	
141	Anitek Software Products	23	FL Worth Computers	44, 45	30	Prosoft	11	
400	Anthropomorphic Systems	98	GE Information Services	110	75	Radio Shack	CII, 1	
378	ATD	7	GrafX	146	75	Radio Shack	115	
152	BCCOMPCO	85	H&E Computronics	CIV	75	Radio Shack	135	
145	Beaman-Porter, Inc.	98	Hard Drive Specialist	53	75	Radio Shack	79	
301	Big D Computers	153	H.D.P.	99	75	Radio Shack	143	
300	Bi-Tech Enterprises	107	H.J.L. Products	129	75	Radio Shack	126, 127	
186	Blue Ridge Software	112	Howe Software	24	503	Severts-Zorman Eng.	112	
86	Compulogic Corp.	155	Hypersoft	118	168	Sigea Systems	41	
78	Compuserv	95	Indian Ridge Enterprises	CIII	63	Softest, Inc.	109	
443	Computer Center, The	141	Instant Software	113	*	Software Support	150, 151, 149, 121	
357	Computer Friends	39, 71	Intercomp Sound	148	427	SOTA Computing Systems, Ltd.	40	
18	Computer Plus	133	J&M Systems, Ltd.	137	71	SUBlogic	99	
415	Computer System Consultants	146	JMG Software International	2, 3	456	Sunlock Systems	140	
45	Cornucopia Software	19	Jameco Electronics	156	347	Talley Communications Co.	118	
398	DCM Data Products	158	Langley St. Clair	38	520	TCE	130, 131	
369	Delker Electronics	134	Laptop	78	146	Telexpress	106	
282	DFW Computer Center	56, 57	Lyben Computer	105	81	Total Access	65	
204	DiskCount Data	33	Marymac Industries, Inc.	154	198	Traveling Software	93	
439	Donald Ady	109	Micro Labs, Inc.	157	227	Trisoft	154	
294	Dorsett Educational Systems	123	Microlite Corp.	8	247	True Data Products	144, 145	
91	Dotwriter	9	Miller Microcomputer Services	69	410	VMC Software	148	
452	Dresselhaus Computer	84	Misosys	67, 81				
85	Educational Micro Systems	26	411	Montezuma Micro	46, 47			
	80 MICRO		416	Montezuma Micro	86, 87			
	Back Issues	70, 104	424	Montezuma Micro	117			
	Best of Model IV	68	281	Nibble Notch	136			
549	Classified Ads	159	232	Nocona Electronics	103			
	Foreign Dealers	73	36	OmniSoft Research	108			
	Instant CoCo	119	201	Optimal Technology	50			
	Load 80 Subscription	64	492	PCA Technologies	59, 118			
	Load 80	96, 97	470	P.G. Design Electronics	83			
	Say you saw it	39, 50	324	Pel-Tek	104			
	Subscription	32	124	Perry Computers	139			
	Subscription problems	41, 98	176	Personal Computer Products	52			

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

Circle 186 on Reader Service card.

PROfix *IV™

RESTRUCTURE & TRANSFER UTILITY

NEW! For PROFILE® 4 PLUS Model 4 — TRSDOS® 6.2 NEW!

49.95

For PROFILE® III PLUS Model III/4 LDOS® or TRSDOS® 1.3 \$49.95

ALSO

For PROFILE® PLUS Model II/12 \$89.95

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 II/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 503 on Reader Service card.

WHEN THE U.S. ARMY NEEDED PROTECTION —THEY CALLED US!

So did the Royal Canadian Navy, AT&T, Lockheed, Motorola, Clemson University, & the entire Colorado State school system.

ZAPSTAR™ PROFESSIONAL—the most advanced surge suppressor/filter available.

Zener Technology plus 3 MOV's provide maximum protection for your electronic equipment & data.

LIFETIME WARRANTY.
Exceeds IEEE standards.

The People with the Most to Protect—Call Us for Protection. At **\$79.95**, Why Settle for Less?

**TO ORDER
THE ZAPSTAR™
PROFESSIONAL
CALL TOLL-FREE
1-800-624-8189
IN FLORIDA
(305) 722-7770**

ZAPSTAR

Severts Zorman Engineering, Inc.

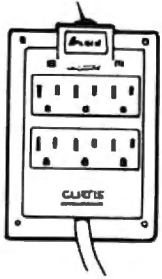
TO ORDER CALL TOLL FREE

800-843-6700

DON'T WAIT UNTIL THE LAST MINUTE!
 Take advantage of these GREAT prices

LOOK

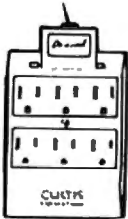
DOLLAR DISKS !!



**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**



Also Available	LIST	SALE
Flip 'n' File /50	\$19.95	\$14.95
Data Defender /35	\$ 9.95	\$ 7.95
Data Defender /70	\$26.95	\$19.95
Roll Top /100	\$49.95	\$39.95



**Kill Spikes, Fight Surges!
 MAXI Strip**

Protect Valuable electronic equipment and data files from damage. Surge and spike suppressor and noise filter combination converts one outlet into six.
 List \$34.95 **wow!!! only \$19.95**

Also save on surge suppressors by

CURTIS . . .	LIST	SALE
Diamond	\$49.95	\$39.95
Emerald	\$59.95	\$49.95
Sapphire	\$79.95	\$69.95
Ruby	\$89.95	\$79.95

Diamond Surge Protector: Six Outlet, Switched, Plugs Directly into Outlet, Hot to Neutral and Ground Protection, LA Approved, Lifetime Warranty.
#SP-1 Retail \$49.95

**FAN FOLD
 COMPUTER PAPER**

	LIST	SALE
15# 1000 Sheets	\$14.96	\$ 9.95
20# 1000 Sheets	\$19.95	\$14.95
20# 1000 Sheets micro-perfed	\$19.95	\$14.95
20# 2500 Sheets	\$32.95	\$26.95

LOOK !
 ONLY \$3.95 FOR THESE
 INFORMATIVE AND
 EDUCATIONAL BOOKS!

80 MICRO REVIEW
 READ REVIEWS OF SOFTWARE AND
 HARDWARE.

LOW-COST COSTING
 RUN YOUR BUSINESS BETTER WITH
 COST MANAGEMENT BOOK AND
 SOFTWARE COMBINATION.

TRS-80 ENCYCLOPEDIAS !!
 Get a \$200.00 value for only \$40.00! Ten volumes at \$4.00 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 3.95 each

TRS-80 DATA FILES
 DB management with simple basic. 3.95

SAVE !! SAVE!! SAVE!! SAVE!!
 Save 10, 20, 30 dollars or more on these great programs for your TRS-80.
Night Flight
 Take part in pivotal WWII battle as you takeoff, land and fly photo recon missions to determine the location of enemy ships (cassette only) **ONLY \$8.57**

DOLLAR DISKS !!

WE KNOW OF NO BETTER DISKS AT ANY PRICE. LIFETIME WARRANTY NATIONAL BRAND.
 SS/DD ONLY \$1.00 Each
 DS/DD ONLY \$1.15 Each
 Also....
 Ultra Magnetic Bonus. Box of 12 22.90
 Sentinel DS/DD Color disks 10 pk. 18.85
 CDC SS/DD 10 pk. 9.95
 CDC DS/DD 10 pk. 10.85
 DYSAN DS/DD Box of 10 33.85

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 disk
- Kitchen Sink disk
- Space Shuttle cass.
- Battle Ground cass.
- Mystery Fun Hse cass.
- Galactic Empire c & d
- Dragonquest cass.
- Temple of the Sun c & d
- Ball Turret Gunner cass.
- Alien Attack Force cass.
- Cosmic Patrol cass.
- Swamp War cass.
- House of 30 Gables cass.
- Domes of Kilgary cass.
- Flying Circus disk
- Master Reversi c & d

UTILITIES AND EDUCATION

- CASSETTES
- Cassette Scope
- Terminal -80
- Music Master
- Programers Converter
- Programers Primer
- Investors Paradise
- Renum Compres
- Disassembler
- Music Teacher
- The Elements
- Everyday Russian

- DISKS
- Disk Editor
- Teachers Aide

instant Software

computer centers

TO ORDER CALL TOLL FREE 1-800-843-6700 OR CLIP AND MAIL:

INSTANT SOFTWARE
 82 MAIN ST.
 KEENE, NH 03431

NAME _____
 ADDRESS _____
 CITY _____
 STATE _____ ZIP _____

IN NH CALL 603-352-3763

Some items are limited in quantity.

M.C., VISA, M.O. OR CHECK ACCEPTED
 ADD \$3.00 FOR SHIPPING AND HANDLING

within existing menus. With the Command Builder, you can design your own commands for running applications, batch files, and so on. You can also program your menus to switch directories or menus.

Since Idir was written for the IBM PC, you need to run KEYCNVRT.SYS from your CONFIG.SYS file to make all functions perform correctly on a Tandy 1000. To do so, make sure DEVICE=KEYCNVRT.SYS is the last command in your CONFIG.SYS file.

The program was designed primarily for hard disk systems, but works very well on a dual floppy drive system. While Idir does work on a single-drive system, you lose many of its capabilities.

Starbridge DOS

Like Idir, Starbridge attempts to provide shortcuts for many DOS commands. It isn't quite as friendly as Idir, nor is it as intuitive to use.

The program comes on a protected disk that allows you a maximum of two more copies on either hard or floppy disks. If you've already made two copies, you can't install Starbridge on a third disk without removing it from one of the first two disks. The program's size is about 64K.

Starbridge's menu is divided into four sections: the Custom, System, One-Key, and Command menus, shown from top to bottom in Fig. 2. You choose options by pressing the indicated number or function key, or by using the arrow keys to position a block cursor over the function you want and pressing the enter key. When you invoke a function, the Command menu (blank in Fig. 2) prompts you for the necessary input until the task is completed.

Some options, like the Help and DOS reference guides, load in other modules from disk, and may take a couple of seconds to load and execute.

As its name indicates, the Custom menu lets you create a list of up to nine program names for quick execution. To run one of these programs, simply place the box cursor over its name and press the enter key. You edit the list from the System menu.

The System menu sets up your computing environment. Its eight options allow you to set the time, date, and default drive; configure and create directories and subdirectories; reach a Starbridge Hotline via modem; access the help guide or quick reference guide; and enter direct DOS commands.

The help option provides information about the IBM PC keyboard and a tutorial called PC Fundamentals. The latter describes the PC's components, including RAM, ROM, the CPU, and so on. Because

Like Idir, Starbridge attempts to provide shortcuts for many DOS commands.

the IBM PC and the Model 1000 differ, the descriptions don't always apply to the 1000; however, the concepts are presented well enough to give you an overview of your computer system.

You can use the Hotline link to ask questions or make suggestions about the program. Both 300- and 1,200-baud operation is supported.

The One-Key menu lets you enter often-used DOS commands with the function keys. You can view, copy, tag, rename, print out, and erase files; copy or format disks; or exit Starbridge. I discovered that you must enter a drive identifier in front of a file name to access a file, even if you've changed the default drive from A. This seems to defeat the purpose of the program, which is to make entering DOS commands easier.

Conclusion

The Idir manual is informative and contains helpful examples. The program also comes with a quick reference card and a file management guide, which covers subdirectories, DOS file specifications, and batch files.

Idir is a valuable utility. It lays out all your system information in front of you and simplifies DOS operations. Although it contains numerous features, the program is easy to use.

Starbridge's documentation consists of two booklets, one of which is an installation update. The manuals cover installation procedures more than the program's operation. The easiest way to learn Starbridge is to experiment on your own.

Although Starbridge has some nice features, it also has a few bugs. I didn't quite understand a warning message that appeared in the Command menu section every time I entered Starbridge. The message indicated that fewer than 1,000 bytes were left on the current drive, while at the same time another message in the System menu section indicated that 144K was still available. Also, I found my computer locked up when I tried to access a blank screen in the reference section. ■

Dear Reader. . .

by Edward Spitzbarth III

★★★★★

Speed Reading Plus runs on the Model III (48K) and requires one disk drive. An MS-DOS version is also available. LSR Learning Associates Inc., 707 Broad Hollow Road, Farmingdale, NY 11735. 516-293-6699. \$49.50 for TRSDOS. \$69.50 for MS-DOS.

Easy to use: ★★★★★

Good docs: ★★★★★

Bug free: ★★★★★

Does the job: ★★★★★

Most people wish they could read faster. Speed Reading Plus is a good self-improvement program based on tried and true teaching methods, with added features that can come only from using a computer.

Speed Reading Plus comes on two disks: an auto-run program disk and a "flippy" lesson disk. The documentation is a small booklet containing all the information you need to operate the program.

Speeding Up

You start by taking the program's Entry Level Survey, which tests your present reading speed. A word or group of words is flashed on the screen, and you have to identify it from a list. You're shown 20 screens, each successive one flashing for a shorter period.

You then read from the screen three stories; the computer figures your speed and tests your comprehension.

The program now sets your reading speed for your first lesson. During each lesson, the program adjusts the next lesson according to your progress.

Each of the 15 lessons presents a short story. You start with two vocabulary drills on words from the story.

The story for each lesson is displayed twice. The first time through, you're shown only three or four words at a time; the speed is determined by your skill. Afterward, you answer 10 comprehension questions and get your score. Next, the program displays the complete story on-screen, and you hit a key when you're finished reading. Another comprehension test follows.

After a lesson, you get a final report, which you may print out. Up to six people may use the two program disks.

Conclusion

Speed Reading Plus could improve not only your reading speed, but also your general reading skills. The program is easy to use and would be ideal either at home or in a high school classroom. ■

Circle 75 on Reader Service card.

Stumped on Software?

Find the powerful applications you need with Tandy's Express Order Software service.

Having trouble finding just the right program for your Tandy/Radio Shack® computer? Drop by your local Radio Shack Computer Center and choose from the most complete selection of software available.

Our exclusive Express Order Software service brings you the hottest-selling packages—each one performance proven and professionally supported by the software manufacturer. Your order is transmitted electronically and shipped the next business day for the fastest service.

Send for your free copy of the new 1986 Radio Shack Software Reference and Tandy® Computer Guide. In it, you'll find hundreds of popular programs. Choose from powerful accounting, word processing, spreadsheet analysis, database management, integrated software and multiuser packages. You'll also find the best in personal and educational software, plus exciting games.

Radio Shack Computer Centers are your one-stop software headquarters. Come in today!

Radio Shack
COMPUTER CENTERS

A DIVISION OF TANDY CORPORATION

Send me a free RSC-16 Software Guide.

Radio Shack, Dept. 86-A-984E
300 One Tandy Center, Fort Worth, TX 76102

Name _____

Address _____

City _____

State _____ ZIP _____

Phone _____



The Hard Disk Controller and 10-Megabyte Hard Disk System

★★★

The **Hard Disk Controller** works with the Models III (48K) and 4 (64) and requires the 10-megabyte Hard Disk System, the Hard Disk Cable Kit, and one disk drive. Tandy/Radio Shack, One Tandy Center, Fort Worth, TX 76102. Catalog number 26-1138. \$449.95.

The **10-Megabyte Hard Disk System** works with the Models III, 4, 1000, and 1200 and requires either the Hard Disk Controller (Models III and 4) or the Hard Disk Controller Board (Models 1000/1200). It requires one disk drive. Catalog number 25-1025. \$699. See address above.

Hard disk prices have been dropping for the past year, but it's the MS-DOS computer owners who have reaped the benefits. They can easily buy a mail-order 10-megabyte hard disk for \$500 or less. Meanwhile, Model III/4 users can only groan about the prices they have to pay for the same storage—generally about twice as much.

Tandy's hard disks have always been relatively expensive and this new system is no exception. The controller works only with Tandy's external 10-megabyte hard drive, and the combined cost is a hefty \$1,200.

Setting up the controller and hard drive is very easy. The controller's documentation is a three-page pamphlet, while the hard disk's pamphlet, which runs to five pages, deals with installation on a Model 1000 or 1200.

You will also need a hard disk cable and a hard disk driver. One option is to buy the Radio Shack Hard Disk Cable kit, which comes with TRSDOS 6.2, hard disk utilities, a cable, and the TRSDOS manual (catalog number 26-1134, \$79.95). Another option would be to buy a cable and driver from a third-party source.

Everything is done automatically by the Radio Shack drivers. You just boot up the hard drive system disk and answer the prompts. You will be asked how you want to set up your system, including how you want to format logical drives and whether you want to create TRSDOS and LDOS partitions.

After answering all the questions, you're told that it will take about 29 minutes to format the hard drive. You might as well go to lunch. When you return, you'll have 9792K of storage. It's at this point that you'll wish TRSDOS 6.2 had

subdirectories like MS-DOS 2.x. When you start to fill up the hard drive with your files, scrolling through the directory can get tedious. Some sort of directory manager is really needed.

The unit looks nice and doesn't take up much space, since the hard disk sits on top of the controller. The hard disk cable is a paltry 48 inches long; it might be wise to get a longer one.

While this system has the makings of a sensible hard drive unit for the Models III and 4, right now it's just too expensive. If Tandy dropped the price and bundled it with the Model 4D, then they'd really have something.

—Ryan Davis-Wright

Using Super Utility + 3.x

★★★★

Using Super Utility + 3.X, Super Utility 4/4P, and Powertool. Softcover, 104 pp. Paul Wiener and Gary Camp. PowerSoft Inc., 17060 Dallas Parkway, Suite 114, Dallas, TX 75248. 214-733-4475. \$19.95.

Soon after PowerSoft released their classic disk utility, Super Utility, they published a fine companion book called *Inside Super Utility Plus*. Since then, PowerSoft has released an updated Super Utility and a native Model 4 version. In addition, Radio Shack sells a stripped-down version called Powertool. Because these changes in the program left the book outdated, PowerSoft commissioned a revised edition from the original authors. Besides being more current, the new edition includes an index, correcting the earlier edition's one major deficiency.

Using SU+ starts with a lucid technical introduction to disk systems that by itself is worth the book's cover price. This section covers the floppy disk controller (FDC); how a disk is divided into tracks, granules, and sectors; the difference between a cylinder and a track; the differences between disk drives; disk recording densities; and much more.

Once the technical jargon is out of the way, *Using SU+* explains Super Utility's configuration table. Setting up the configuration table can be a formidable task for inexperienced users, but with the book's help, you'll be able to do the job quickly and fairly painlessly.

The remainder of the book is devoted chiefly to repairing blown disks. Wiener and Camp present a multitude of basic techniques for recovering damaged files and crashed directories, and fixing other disk problems. The authors also explain how to decide intelligently

which techniques are best for a particular problem.

Using SU+ is an excellent book. Anybody who does even occasional disk repair will find it packed with information. Super Utility owners will wonder how they ever got along without it.

—Mark Goodwin

Webster's New World Spelling Checker

★★★★

Webster's New World Spelling Checker runs on the Tandy 1000/1200/3000 (256K) and requires one disk drive. Simon & Schuster Inc., Computer Software Division, 1230 Avenue of the Americas, New York, NY 10020. \$59.95.

When it comes to my software budget, I run a tight ship. Outside of a robust word processor, few programs qualify for my hard earned dollars. Recently, Webster's New World Spelling Checker has joined this select few.

The single distribution disk supports a data base of 114,000 words. You may augment the list so that special terms are not treated as misspellings.

What the spelling checker can't find in its massive dictionary, it attempts to correct by a host of clever techniques. It tries phonetic spellings, suggesting for example, "phenomenal" for the misspelled "fenonmenal." It uses transposition logic to catch common typing errors, substituting "repeated" for "erpeated." The program also recognizes missing punctuation ("arent"), hyphenated words, and abbreviations. It rightfully should be called Webster's Spelling Checker and Corrector.

You have full control over applying suggested corrections, which might number up to 10 words for each misspelling. Questionable words appear in boldface on the screen in their original context within the source document. You may then substitute a word from the list of possible valid spellings shown in another window, or you may edit the text.

The text editor covers rudimentary operations including modification, insertion, and deletion. Massaging text with an editor could create compatibility problems with the word processor you used to prepare the document. Webster solves this potential problem by allowing you to configure the program for any of 18 popular word processors.

Simon & Schuster intends to make Webster's electronic dictionary a disk standard. Considering the program's low price, they just might do it.

—Ed Joyce

PRINTER SALE

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)



Low Profile Design
ONE YEAR WARRANTY



\$229 (Add \$10 S & H)
List \$299

StarWriter™ Y-10, F-10 40/55.
Daisy wheels with speeds ranging from 22 to 58 CPS for the sharpest in letter quality printing. 13.5 and 15-inch carriage widths. Switch-selectable pitches 10,12, and 15. Compatible with all popular word processing software.

ProWriter™ Jr. Near letter quality and 105 CPS for data processing. Compatible with all popular PCs. Built-in stand, easy front paper loading. The low cost answer for professional performance.



As Low As **\$899**
(Add \$15 S & H)

- F10-40 15" wide 40cps Diablo/Qume printwheels . . . \$899
- F10-55 Fastest DW printer at 58cps 15" wide . . . \$999
- F10 Bi-Directional Tractor . . . \$199
- F10 Mechanical sheet feeder . . . \$299



As Low As **\$299**
(Add \$12 S & H)

ProWriter™ 8510S/1550S + NLQ Series Dot Matrix Printers. Near letter quality, 180/120 CPS with throughput speeds of up to 110 LPM for far faster text and graphics than competitors. Models specifically designed to provide the finest performance and flexibility with IBM® and Apple®/Macintosh® microcomputers.

- 8510 BPI IBM Graphics, 120cps 10" friction/tractor . . . \$299
- 8510 SEP IBM Graphics, NLQ and faster at 180cps . . . \$399
- 8510 CEP IBM Graphics, 180cps plus 7 colors . . . \$499
- 1550 EP 15" wide 120cps friction/tractor included . . . \$499
- 1550 BCD Like above but RS232 interface . . . **SPECIAL . . . \$299**
- 1550 SEP 15" IBM Graphics NLQ and a fast 180cps . . . \$599

ProWriter™ 24LQ. The Ultimate Printer. 24-pin dot matrix printer. 6 printers in 1 for all professional printing needs. 200 CPS for data, 133 CPS memo quality, 67 CPS letter quality. Selectable type styles. Up to 7-color graphics at 360 x 360 DPI.



\$999 (Add \$15 S & H)
List \$1299

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



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 TRS-80 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 or MS-DOS. As you copy, Hypercross also puts in spaces as needed, changes PRINT @ statements and flags potential trouble spots.

- PRICES** Incl. disk manual, S/H. Includes Basic convert (not CoCo).
- Hypercross CoCo for TRS-80 <-> Color Computer only \$49.95 ppd
 - Hypercross CP/M with 40 single-sided CP/M formats \$59.95 ppd
 - Hypercross PC/MS-DOS standard formats \$59.95 ppd
 - Hypercross XT/2.0 with 90 CP/M and PC formats \$99.95 ppd
 - Hypercross XT/2.0-Plus. Now with 200+ 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 VIII/IV disk. **Autopilot mode** allows learns, saves and repeat 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

Arranger II Disk Index System

World's finest disk cataloging system. Now you can find that file when you want it. **Arranger** with **CATALOG, SORT and FIND** up to 11000 files fast! Runs on any Model I, III or IV and automatically recognizes any DOS, even double-sided. **Arranger II** from Triple D—highly recommended. \$52.95 ppd

XASM68K a 68000 cross assembler

XASM68K is an assembler that lets you write and develop assembly language programs for the 68000 microprocessor using your TRS-80, CP/M, Apple or IBM PC type computer. Supports standard Motorola mnemonics, conditional assembly, macros. Complete with sample source listings and manual. **XASM68K**—specify computer Model # AND DOS \$49.95 ppd

Analyze your diet with NUTRITION

NUTRITION will let you evaluate the nutritional value of your diet using the 14 items measured by the USDA in terms of the US Recommended Daily Allowances. You can use it to evaluate possible diets setting limits on each item. Comes complete with an on-disk data base drawn from USDA handbook #456. This program is ideal for use in Nutrition classes having been tested extensively in a University course.

NUTRITION—a feast for your Model 4 or PC compatible \$49.95 ppd

For 128K Model 4 users!

TMDD The Memory Disk Drive allows NEWDOS-80 V2.0 to use the extra 64K memory bank as an instant electronic disk drive. Use it as your system drive! Works with Hypercross, no need for DOS in drive 0.

TMDD The Memory Disk Drive for Model 4/4P with 128K \$39.95 ppd

ZIPLOAD—a real time saver! Fed up with waiting for MODELA/III to load or setting up DOS and MEMDISK? Now **ZIPLOAD** lets you make yourself a super fast loading self-booting disk for rapid loading of DOS, Memory disk and ROM image. Example: loads Model 3 DOS and ROM image in 1.4 sec after reset delay. Free upgrade offer to make NEWDOS self-booting on the 4P.

ZIPLOAD great for Model 4 and 4P \$31.95 ppd

Exciting new programs

Under an agreement with Mollimerx UK we are offering some of the best of their extensive range of TRS-80 software. Here is an abbreviated list, except where noted, they are for Model 1, 3 and 4/4P (in 3 mode).

- Hartforth First Class FORTH for TRS-80 1, 3, or 4 versions ... \$65.00 supports integers, floating point, strings, DOS functions and much more. Includes a full screen editor. Professional version for Model 4 includes many extra features.
- Pascal 6.3 Editor, Compiler and Run-Time for Models I and III ... \$65.00 A first class implementation of ISO standard Pascal.
- Enigma Encrypt your files in an unbreakable code \$29.95 Uses the German High Command's World War II code.
- Driver Compiler.. Make your own Epson printer drivers \$23.95 Adds new character sets to your printer.
- Mysterious Adventure Series 1-10 3 or 4 per disk \$29.95 An exciting series for adventure fanatics.
- Fairytales, Wonderland and Dreamworld Adventures each \$16.95 At last, adventures that young children can enjoy.

Many others available, write or call for complete list.

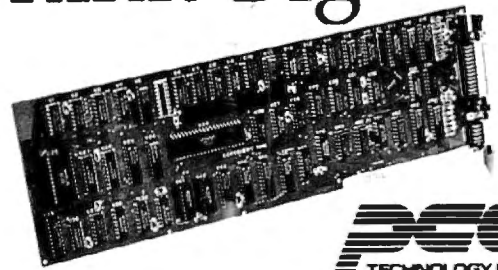
HYPERSOFT

PO Box 51155, Raleigh, NC 27609
(919) 847-4779

Check, COD, Mastercard and Visa Accepted



Think Big



The PCA Multiboard \$299 (Sugg. retail w/OK)
Up to 2MB and Multifunction for the Tandy 1000 and other compatibles.

Everything your Tandy 1000, 1200 HD or IBM compatible needs for big jobs, but for a small price. **DMA** on board, **RS-232** port, **clock/calendar**, **RAM Disk**, **Print Spooler**, and up to **2MB** of Lotus/Intel or DOS compatible memory. For less than the cost of most ordinary multifunction boards, get all the compatibility you'll ever need. Available now in 10" size (shown) for use up to 2MB.

To order or for more information call 714-991-3121
Ask us how to make your Tandy 100% compatible

Dealer inquiries invited. **PCA Technology**
1440 S. State College #2E
Anaheim, CA 92806
*Includes DMA for Tandy 1000, \$279 without DMA

TRS 80 Computers

All Tandy Computer Products Available
Manufacturer's Warranty

- Model 1000**
- Model 1200 HD**
- Model 2000**
- Model 3000**
- Model 4D**
- Model 100/200/600**

Micro Mainframe 4 in 1 Mem. Exp. Boards
All RS Monitors

Unbeatable Prices

Visa — MasterCard
Cashier's Check — Money Order

Business Telephone Systems—Discount Prices—
Install your own. Completely modular.
Call for Prices

Computer Specialist available for assistance.

TALLEY COMMUNICATIONS CO.

P.O. Box 193 • 200 W. Walnut
Decatur, Texas 76234 • 817-627-2553

Call for other computer, telephone and accessory prices!

Fast Delivery

References Available

It's Here!

instant CoCo's Best of '85



A Software Feast for You and Your Color Computer

No matter where, why, or how you use your Color Computer, don't let another day slip by without getting instant CoCo's **Best of '85**. It's a 30-program bonanza of software—the best programs from a whole year of **HOT CoCo** magazine—shipped to you on a single high quality cassette.

The Best of the Best

Highlights of this year's collection include "Homespread," a simple-to-use, yet full featured spreadsheet program. You'll be amazed at your own artistry as you create hi-res graphics with "Paint King." For entertainment, let "Five Card CoCo" turn your Color Computer into a tough Blackjack foe.

You get utilities, games, business and home

applications. In short, the best of the best, carefully selected for you by the editors of **HOT CoCo**.

The Year's Top Programs

From every month of 1985, we've chosen the most popular and significant programs. Software you'll find challenging, entertaining, practical, perhaps even indispensable, including. . .

- **JANUARY**—"The Adding Advantage"
- **FEBRUARY**—"Space Hawk"
- **MARCH**—"Don't Print There!"
- **APRIL**—"Orbital Observations"
- **MAY**—"Closed for Inventory"
- **JUNE**—"Fabulous Fonts"
- **JULY**—"Date Minder"
- **AUGUST**—"Screen Symmetry"
- **SEPTEMBER**—"Disk Data Recovery"
- **OCTOBER**—"Master World Geography"
- **NOVEMBER**—"Mathematics Helper"
- **DECEMBER**—"Crossword Creator"

No Keyboarding, No Debugging!

Get these programs, and many more, all thoroughly debugged, updated, and ready to run on your Color Computer. All 30 programs run in 32K or less, with many requiring just 16K. Complete documentation is included with each cassette.

Make '86 your year to buy nothing but the Best. Order your copy of instant CoCo's **Best of '85** today. And while you're at it, order that other great software package. . .instant CoCo's **Best of '84**, still available in limited quantities!

To order, simply return the enclosed coupon, or call **1-800-258-5473**. (In NH, please call 1-924-9471.)

5-861C

Yes! I want to buy the Best.

Please send me instant CoCo's **Best of '85** for \$16.47 ea.*

Payment Enclosed () Visa () MC () AE ()

Card # Exp. Date

Signature

Name

Address

City State Zip

I WANT EVEN MORE! Please send me the **Best of '84** cassette, while supplies last, for \$16.47 ea.

Prices include postage and handling
* Best of '85 available in February 1986.

instant CoCo • 80 Pine St. • Peterborough NH 03458

PEEK Performance

by John Ashbury Majka

Controlling your Color Computer is much easier if you have a firm grasp of how to use the PEEK, POKE, and Execute (EXEC) commands. To help you understand them, I've written a sequel to my March 1985 *HOT CoCo* article, "Those Amazing POKEs" (p.28). For the benefit of readers who are new to the subject, I'll begin by explaining what PEEKs, POKEs, and EXECs are.

A POKE is a command in the form POKE L,V. L is any location in memory (zero to 65535) and V is a value (zero to 255) to be placed in that location. PEEK's format is PEEK (L), where L is any memory location. To use a PEEK, you set a variable equal to PEEK (L), and the value stored at location L defines the variable. The EXEC command, in the form EXEC L, transfers control of the computer to memory location L.

PEEKing In

PEEKs are most commonly used for reading information that can't be ascertained through Basic commands. If you wanted to find the ASCII value of the character in a specific screen position, for instance, you would type in X = PEEK followed by, in parentheses, the memory location where the number is stored. For example, X = PEEK (1024) gives the ASCII value of the character in screen position zero.

You might use PEEK in a program that loads and saves other programs. Instead of prompting the user to specify whether the program is to be loaded from tape or disk, try comparing PEEK (49152) to ASC(D). If the value of the PEEK equals the ASCII value of D—68—a disk controller is plugged into the computer.

To save machine-language routines, you need to know their start, end, and execution addresses. You can find them with PEEKs. The start address is revealed by PEEK(487)*256 + PEEK(488), the end address by PEEK(126)*256 + PEEK(127) - 1, and the execution address by PEEK(157)*256 + PEEK(158).

System Requirements

All systems

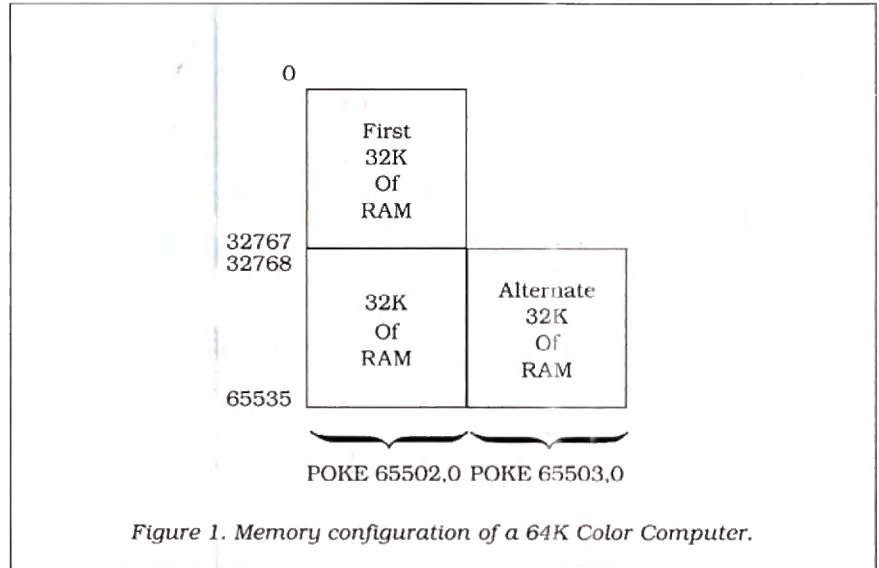


Figure 1. Memory configuration of a 64K Color Computer.

Knowing these numbers, you can save the routine with a command in the form CSAVEM "filename", start address, end address, execution address.

Have you ever wondered where the cursor goes during a program run? Solve the mystery with PEEK(136)*256 + PEEK (137), which reveals the cursor's temporary address.

To determine the last variable used in a program, type in PRINT CHR\$(PEEK (55)) + CHR\$(PEEK(56)). Memory location 55 holds the ASCII value of the variable name's first letter (or the only letter if you used a one-character variable). Location 56 holds the second letter or number. Note that if you place a number in parentheses after the variable—as in V(7)—it will not appear in 56.

To find out which PMode is being used,

type in PEEK (182). This works only if you used the PMode command, since setting the PMode in machine language doesn't affect location 182.

You can read the name of the last file loaded by PEEKing locations 466-473. This short program prints their contents:

```
10 FOR L = 466 TO 473
20 PRINT CHR$(PEEK(L));
30 NEXT L
```

Even if the file wasn't actually loaded, locations 466-473 will hold the file name used in a CLOAD or SKIPF command.

Sample POKEs

If you've ever tried to back up a ROM cartridge onto disk or cassette, you know how hard it is to disable the auto-start action of the ROM pack. No longer.

Old Characters	Address	To Change...	New Characters
S	43747	POKE 43747, ASC("N")	N
O	43748	POKE 43748, ASC("O")	O
U	43749	POKE 43749, ASC("I")	I
N	43750	POKE 43750, ASC("S")	S
█	43751	POKE 43751, ASC("E") + 128	█

Figure 2. Using POKEs to change Basic command names.

TURBO-M™

Check Out Our Systems — High **QUALITY** 4 layer **TURBO** motherboard at the **LOWEST** prices.
Our hard drive systems — an **EXTRA** megabyte of Storage **FREE**
(more megabytes for less megabucks)

Our monitors are high resolutions with minimum 1,000 lines
— They even have their own tilt and swivel base at no added cost. —

Powered by a heavy duty power supply, and offering **TRUE** turbo speed.

ONE FULL YEAR WARRANTY

COMPARE OUR SYSTEMS — TURBO M is the COMPETITION



SYSTEM-A-SINGLE FLOPPY SYSTEM
\$899.95!

TURBO M PC COMPLETE SYSTEM
Dual Speed CPU — 4.77 AND TURBO
NEC V20 PROCESSOR

640 K memory	2 parallel ports
8 slot motherboard	Clock calendar
135 Watt Power Supply	Game Port
Monochrome TTL Card	Keyboard 5151 Style
Monochrome Display High Res	Ram spooler and
Tilt and Swivel Base Monitor	Printer spooler system
Serial port (2nd port opt.)	DOS 2.11

SYSTEM 22-HARD DRIVE SYSTEM
22 MEGABYTE SYSTEM \$1,399.95!

Toll Free Ordering 1-800-343-8841

TURBO M / AT—COMPLETE SYSTEMS

STARTING AT \$2,359.95 !!!

ONE FULL YEAR WARRANTY



Comes Complete with
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
DOS 3.1 — AT Keyboard

ADD-IN BOARDS TO HELP YOU BUILD YOUR SYSTEM

TURBO-M Motherboard Dual Speed \$299.95	Monochrome Graphics Card with Printer Port \$94.95	Floppy I/O Card Controls Two Floppy Drives, Serial Port Parallel Port Clock Calendar Game Port \$109.95	Winchester Hard Drive Controller \$139.95	10 Megabyte and 20 Megabyte Drives Complete System Drive, Controller, Cables and easy to follow instructions. \$369.95 — \$469.95	Color Graphics Card with Printer Port \$118.95
135 Watt Power Supply \$89.95	Multi Function Card with Space for 384K of Memory, Serial Port, Parallel Port Clock Calendar, Game Port \$89.95	5151 Compatible Keyboard with Separate Cursor and Number Pads \$124.95	Monochrome Monitor with High Resolution Tilt/Swivel Base \$179.95	Floppy Drive Card Control up to Four Drives \$79.95	P.C.DOS 3.1 \$80.00
					Flip Top Cabinet with Speaker \$64.95

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.

5 megabytes starts at \$239.95
10 megabytes starts at \$369.95
20 megabytes starts at \$469.95
60 megabytes starts at \$1,299.95

REMOVABLE MEDIA SPECIAL
5 Megabyte Cartridge Hard Drive Now
Specially Priced!

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.

5 megabytes \$449.95
10 megabytes \$679.95
15 megabytes \$749.95
20 megabytes \$849.95
24 megabytes \$899.95
30 megabyte-fixed & removeable \$1,399.95
40 megabytes \$1,299.95
50 megabytes \$1,449.95

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.

TERMS and CONDITIONS:
All prices are cash discounted. However, we do
accept MC, VISA, AMEX & DISCOVER credit cards.
Please inquire.

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 at no added cost.
Not responsible for typographical errors.

SOFTWARE SUPPORT, INC

1 Edgell Road

Framingham, MA 01701

1-617-872-9090

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

After typing in POKE 65315,54, you can plug in a ROM pack without the cartridge's auto-starting and without fear of damaging the computer. The ROM code can be saved by entering CSAVEM"file name",49152,65279,49152, or you may use a system-altering POKE such as POKE 65495,0, which will speed up cartridge operation. When you are ready to use the software in the pack, type in EXEC 49152 to send control of the computer to memory location 49152.

You can change the volume of Extended Color Basic's Play command by altering the contents of location 223. The formula is POKE 223,128+(V*4), where V is the desired volume. Using the alternate formula POKE 223,(31-V)*4 will make the sound more raspy and realistic.

Store multiple programs in memory by manipulating locations 25-28. CLOAD the first program and type in:

A = PEEK(25);B = PEEK(26);C = PEEK(27);
D = PEEK(28)

Write down the values and type in POKE 25,C:POKE 26,D. You can now CLOAD the second program without its overlapping the first. When you want the first program, type in POKE 25,A:POKE 26,B. To select the second, use POKE 25,C:POKE 26,D.

Finally, you can change the cursor position at locations 136 and 137. Set L equal to the new cursor location and type in:

POKE 136,INT(L/256):POKE 137,L-INT(L/256)*256

If you enter this sequence directly, don't be surprised if the cursor winds up in the left margin about two lines below where you want it. When the computer returns to Basic, the OK prompt appears in the left margin of the line below L, pushing the cursor down.

In a program, however, the 136 and 137 POKEs work like the Print@ command: the printed material is placed at location L. After the program ends, the cursor appears two lines (three if you press the break key) below the last printed line (or below L if you used no Print commands).

Apparently, you can place the cursor in any location below 1536, the end of the text screen. But beware of POKEing it to locations between zero and 1024, which are used to store Basic's internal variables. POKEing there could cause the computer to go temporarily insane, requiring a restart.

Explorations in 64K

If you have 64K of RAM, you can persuade the CoCo to do things it won't normally do. Figure 1 shows how memory is configured in a 64K machine. Memory locations zero to 32767 (RAM) are used

Program Listing 1. Switches to 64K RAM mode.

```
1# CLEAR 2#0, 32745
2# FOR L=32746 TO 32766
3# READ V
4# POKE L,V
5# NEXT L
6# EXEC 32746
7# PRINT"WELCOME TO 64K!"
8# DATA 26,126,19#128,#183,255,
,222,166,128,183,255,223,167,31,
14#,224,#37,241,57
```

End

Program Listing 2. Displays the contents of Basic.

```
1# CLS
2# FOR L=32768 TO 49151
3# PRINT CHR$(PEEK(L));L
4# NEXT L
```

End

Program Listing 3. RAM Basic and ROM Basic equalizer.

```
1# FOR L=32768 TO 49151
2# POKE 655#2,#
3# V1=PEEK(L)
4# POKE 655#3,#
5# V2=PEEK(L)
6# IF V1<>V2 THEN POKE L,V1
7# PRINT L;NEXT L
8# PRINT"RAM AND ROM ARE NOW THE
SAME."
```

End

for internal variable storage, the text screen, the graphics screens, and program and variable storage. Areas 32768-65535 (ROM) are used for Extended Color Basic and Color Basic, program pack memory, and input/output. Normally, ROM is always in operation, but in a 64K Color Computer, a 32K bank of RAM is set up parallel to it.

Program Listing 1 replaces the ROM bank with the second RAM bank. Type in the program and run it: you will instantly find yourself in 64K RAM mode, which means a mirror-image volatile version of Basic has been placed in RAM. The CoCo will perform the same as before, but the Basic interpreters can now be altered.

Try random POKEing in the Basic interpreter—you might discover an interesting new POKE. If you prefer to POKE with a purpose, try changing the cursor with POKE 41382,x or change the prompt with POKE 44014,x:POKE 44015,x (see "Those Amazing POKEs").

With Program Listing 2, you can try

something even more daring: changing Basic's command names. Assume, for example, you want to change the name of the Sound command to "Noise." If you lack Extended Color Basic, change 32768 in line 20 of Listing 2 to 40960. Then run the program. It will print the contents of the Basic interpreters, one character per line, with the address next to it.

Don't be frightened if you can't decipher the garbage scrolling up the screen. The idea is to wait for the Basic command to appear—in this case, Sound. When you see it, press the break key and jot down the characters in the command name and their addresses. Notice that the last letter of each command is a graphics character (the ASCII value of the graphics character equals the value of the last letter of the command name plus 128). Figure 2 shows the Sound command's addresses.

To change the command, POKE the address of each letter in the old word with the ASCII value of the corresponding new letter (see Fig. 2). Don't forget to add 128 to the ASCII value of the last letter. The old word and the new word must be the same length. As for changing the function of each command, a considerable amount of ambition and machine-language savvy are required.

Now that you know how to customize Basic, you're ready for another joy of 64K computing: bank switching. As Fig. 1 shows, you can flip between ROM and RAM versions of the upper 32K of memory using POKE 65503,0 to install the RAM bank and POKE 65502,0 for the ROM bank. Switching banks does not affect the RAM bank; any changes you made earlier remain in effect when you switch back.

Through tricky machine-language programming, you can set up a driver program in the lower 32K to use the upper 32K of RAM for storing information. The computer can then flip-flop between ROM and RAM as necessary. Bank switching can also be used to correct a defective version of RAM Basic (perhaps one that's bug-ridden from indiscriminate POKEing) by making it the same as the ROM version. Program Listing 3 does this.

To save a version of RAM Basic you particularly like, type in CSAVEM "RAM-BASIC",32768,49151,32768 (again, change the 32768 to 40960 if you don't have Extended Color Basic). To use your custom-designed interpreter, run Listing 1 to kick the CoCo into 64K, then type CLOADM "RAMBASIC", but do not execute. ■

Address correspondence to John Ashbury Majka, 387 Brook Drive, Valparaiso, IN 46383.

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

Just Write

by Nathan Roosth

Commercial word processors offer a wealth of features, but more isn't necessarily better. Added functions can make such programs more difficult to use. If your word processing needs are modest, all you really need is a program that accepts typed information, edits text, saves and loads text files, controls format, and sends files to a printer. Type, an easy-to-use word processor, provides these essential functions (see the Program Listing). In addition, Type lets you number pages and set off text with underlined, compressed, condensed, extended, or boldface type. The printer commands in lines 417, 419, 422, and 423 of the Listing are for the DMP-105 printer; make appropriate changes if you have another printer.

That's Write

When you run Type, the opening menu presents seven options (see Table 1). Option 1, Instructions, summarizes the graphics characters used as printer control codes. Select option 2, Type, to begin typing; use the arrow keys to move within text. Shift/up- and shift/down-arrow move the cursor to the beginning and end of text, respectively. If you make a mistake, relocate the cursor and retype the letter; press the clear key to delete. Type uses @ as a control key. To enter insert mode, press control-I (@ plus I); repeat the sequence to exit insert mode and resume typing.

Type's greatest asset is the ease with which you can embed its six highlighting commands within text. Like the insert command, these special print functions are invoked using control sequences (see Table 2). For example, to underline a book title, press control-U to begin underlining; a graphics character appears as an on-screen marker. Then type in the

System Requirements

16K RAM
Extended Color Basic
Cassette
DMP-105 printer

Program Listing. Type.

```

1 CLS:PCLEAR1: CLEAR250,9645:Z9-S
TRINGS(32,"*"):S=9650:P=S:L=S:M=
7:G=66:N=55:K=1:NS="NO":DEFUSR0=
16292:DEFUSR1=16322:DEFUSR2=1634
8:DEFUSR3=16366:POKE2R2,0
2 FORX=16292TO16383:READAS:POKEX
,VAL("&H"+AS):NEXT
3 DATA BD,B3,ED,1F,02,BE,25,B0,A
6,84,A7,01,10,8C,05,FF,22,02,A7,
A4,30,1F,31,3F,BC,25,AE,26,EB,39
4 DATA BD,B3,ED,1F,02,BE,25,AE,A
6,01,A7,00,10,8C,05,FF,22,02,A7,
A0,BC,25,B0,26,EF,39
5 DATA BD,B3,ED,1F,02,0E,04,00,A
6,A0,A7,00,8C,06,00,26,E7,39
6 DATA 10,BE,25,AE,0E,04,00,A6,A
0,A7,00,10,8C,25,B0,23,F6,39
7 CLS:PRINT032,Z5:PRINT078,"TYP
E":PRINTZ5:PRINT" 1. INSTRUCTIO
NS":PRINT" 2. TYPE":PRINT" 3.
STANDARDS":PRINT" 4. PRINT":PRI
NT" 5. SAVE":PRINT" 6. LOAD":PRI
NT" 7. STOP":PRINT:PRINT" CH
OOSE (1-7)"
8 AS=INKEY$:IFAS=""THENPOKE1454,
159:POKE1454,191:GOTO8
9 ONVAL(AS)GOSUB100,200,300,400,
500,600,700
10 GOTO7
100 CLS:PRINT"ARROWS MOVE CURSOR
*SHIFT UP OR *DOWN ARROW FOR BE
GIN OR END":PRINT"MENU# AND M":
PRINT"INSERT# AND I (BEGIN & EN
D)":PRINT"DELETE#CLEAR":PRINT"UN
DERLINE# AND U "CHR$(182)"BEGIN
& END"CHR$(185)
101 PRINT"BOLD# AND B "CHR$(216)
"&BEGIN AND END"CHR$(218):PRINT"
ELONGATED# AND C"CHR$(218)"BEGI
N AND END"CHR$(213)
102 PRINT"TYPE#STANDARD# AND S"
CHR$(159)"COMPRESSED# AND P"CH
R$(145)"CONDENSE# AND C"CHR$(1
47):PRINT"HYPHENATE# AND H"MOVE
CURSOR TO SYLLABLE#PRESS - FOR
HYPHEN, ENTER#NEXT LINE, #EX
IT"
103 PRINT" CLEAR=DELETE ONE, X=D
ELETE ALL":PRINT" SINGLE HYPHEN#
AND -"CHR$(246):PRINT"PRESS ANY
KEY TO RETURN"
104 EXEC41393:RETURN
200 POKE65495,0:CLS:IFL=S THENZ0
1ELSEGOSUB237
201 AS=INKEY$:IFAS=""THENZ03ELS
EIFF<>L THENPOKEC+1024,PEEK(P):F
ORX=1TO10:NEXT
202 POKEC+1024,159:POKEC+1024,19
1:GOTO201
203 IFAS<>"@":THENZ09
204 AS=INKEY$:IFAS="M"ORAS="I"OR
AS="U"ORAS="B"ORAS="E"ORAS="S"OR
AS="C"ORAS="P"ORAS="H"ORAS="-"TH
ENZ05ELSEZ04
205 IFAS="M"THENPOKE65494,0:RETU
RNELSEIFAS="I"ANDI=THENI=1:GOTO
201ELSEIFAS="U"ANDI=1THENI=0:GOT
O201
206 IFAS="U"ANDU=0THENU=1:AS=CHR
S(182)ELSEIFAS="U"ANDU=1THENU=0:
AS=CHR$(185)ELSEIFAS="B"ANDB=0TH
ENB=1:AS=CHR$(216)ELSEIFAS="B"AN
DB=1THENB=0:AS=CHR$(212)ELSEIFAS
="E"ANDE=0THENE=1:AS=CHR$(218)EL
SEIFAS="E"ANDE=1THENE=0:AS=CHR$(
213)
207 IFAS="S"THENAS=CHR$(159)ELSE
IFAS="C"THENAS=CHR$(147)ELSEIFAS
="P"THENAS=CHR$(145)
208 IFAS<>CHR$(91)THENZ13ELSEIFF
=L THENZ01ELSEIFL=P=1THENPOKEC+1
024,96:L=L-1:GOTO201ELSEGOSUB265
:GOTO201
211 IFAS=CHR$(95)THENEGOSUB232:GO
TO201
212 IFAS<>CHR$(91)THENZ13ELSEIFF
=L THENZ01ELSEGOSUB237:GOTO201
213 IFAS<>CHR$(94)THENZ14ELSEIFC
<32ANDP<S+32THENZ01ELSEGOSUB235:
GOSUB236:POKE341,255:GOTO202
214 IFAS<>CHR$(10)THENZ15ELSEIFF
=L THENZ01ELSEGOSUB239:POKE342,2
55:GOTO202
215 IFAS<>CHR$(8)THENZ16ELSEIFC=
0ANDP=S THENZ01ELSEPOKE343,255:G
OSUB235:IFC=0ANDP=S THENC=31:P=P
-1:X=USR2(P-31):GOTO202ELSEC-1
:P=P-1:GOTO202
216 IFAS<>CHR$(9)THENZ17ELSEIFP=
216 THENZ01ELSEPOKE144,255:IFC<511
THENPOKEC+1024,PEEK(P):C=C+1:P=P
+1:GOTO202ELSEIFC=511THENX=P:GOS
UB230:PRINTC,CHR$(Z):C=48:P=P+
+1:Z=P-GOSUB268:GOTO202
217 GOSUB220
218 GOTO201
219 CLS:C=P:P=S+(INT((L-S)/32))
*32:FORX=P TO L-1:POKEC+1024,PE
EK(P):C=C+1:P=P+1:NEXT:RETURN
Z0 Z=ASC(AS):IFZ>96ANDZ<123THEN
Z=Z-32ELSEIFZ<91ANDZ>64THENZ=Z+3
2
221 IFP=16291ORL=16291ANDI=1THEN
PRINT033,"out of memory":POKE1
200,32:POKE1263,32:RETURN
222 PRINT0C,CHR$(Z)
223 IFC+1=512THENC=479
224 IFI=LANDP<>L THENP=P-1:GOSUB
229:X=USR0(C+1024+L-P)
225 IFZ>96ANDZ<123THENZ=Z-96ELSE
IFZ>31ANDZ<65THENZ=Z+64
226 POKEP,Z:P=P+1:C=C+1:IFP=L-1
OR I=1THEN L=L-1
227 IFC=48THENZ=0:GOSUB268
228 RETURN
229 FORX=9646TO9648STEP2:POKEX,I
NT(Y/256),POKEX+1,Y-INT(Y/256)*2
56:Y=L-1:NEXT:RETURN
230 Z=PEEK(X):IFZ>0ANDZ<27THENZ
+96ELSEIFZ>95ANDZ<129THENZ=Z-64
231 RETURN
232 GOSUB235
233 IFC<32ANDP<S+32THENP=S:C=0:R
ETURN
234 GOSUB236:GOTO233
235 IFP=L THENPOKEC+1024,96:RETU
RNELSEPOKEC+1024,PEEK(P):RETURN
236 IFC<32ANDP<S+31THENP=P-32:X=
USR2(P-C):RETURNELSEC-32:P=P-3
2:RETURN
237 CLS:C=0:IFL<512THENP=S ELS
EP=S+(INT((INT(L-S)/32))-15)*32
238 Y=P:GOSUB229:X=USR0(Y):C=L-P
:P=L:RETURN
239 POKEC+1024,PEEK(P)
240 X=P+(511-C):IFC<479ANDC<512A
NDX<L THENEGOSUB230:PRINT0511,CHR
$(Z):C=C-32:FORW=1504TO1535:X=X
+1:IFX=L THENZ41ELSEPOKEW,PEEK(X
):NEXT

```

Listing continued

Circle 135 on Reader Service card.

PenPal

Version 2.0
Now Available

The Intelligent Choice...



89⁹⁵

(119.95 CDN)

ADMIT IT! Your computer always had the power, but never the software. Now...Four Star Software presents a product unlike any other. Penpal! This is a package intelligent enough to help you reach new heights of personal productivity. Designed to be learned in less than a day, the entire program is quick and easy, powerful but elegant. A pleasure to use!

Penpal provides you with a package that combines the five most wanted computer applications into one incredibly easy-to-use integrated environment. This sets a new standard of excellence in applications software: What would you pay for a program that does it all, but does it easily?

We invite you to compare PENPAL'S list of outstanding features with any other software currently on the market for any computer! Packages like this cost hundreds more on other machines. PENPAL brings the power of a PC to your CoCo at an Unbelievable and Unbeatable price! We guarantee it...if you are not completely satisfied, return it within 30 days for a prompt refund.

For a limited time, take advantage of our low introductory price. You won't be disappointed you did!

Order your personal copy of PENPAL today to finally realize the full potential of your Color Computer. Available directly from Four Star Software or enquire at your local Computer dealer.

- Twelve function Keys and a continuously displayed reminder line make this program easy to use. No complicated key combinations or commands to remember!
- On-line help function
- Hi-res 51 x 24 display screen
- Common formats and commands in all five modules make this package easy to learn and user friendly.
- Fast and effective 255 by 255 spreadsheet is very versatile. Flexible text editor includes all common features found on others plus centering, justification, and pagination. Efficient database includes advanced indexed sorting capability and much, much more!
- Create full color, presentation quality graphs with variable size labels directly from your spreadsheet in pie, line, dot or bar formats using the Graph-it function. Incredible!
- Upload and download files, access networks, or communicate with other users with built-in Telecom feature. This is not just a simple dumb terminal package!
- Modules interface with each other to form a truly integrated package unlike any you have ever experienced. These are not just separate programs that are selectable from central menu like others offer!
- Comes in an attractive binder set, with reference manuals. Requires 64K and minimum of one disk drive.

Order Hotline
416-858-STAR



Four Star Software

Box 730, Streetsville Post Office
Mississauga, Ontario
Canada L5M 2C2

Dealer enquiries welcome write or call for our free Catalogue. Add \$3.00 for shipping and handling overseas order Add \$8.00

Circle 75 on Reader Service card.



DeskMate® 7-in-1 software makes your Color Computer better than ever.

Now our popular DeskMate® software is available for disk-based Color Computers! DeskMate (26-3259, \$99.95) features seven popular personal-productivity programs—all on one disk!

A general-purpose *TEXT* entry and editing program performs search and replace, file merge and block select, copy and delete. It's ideal for writing correction-free letters, memos and short reports.

A simple spreadsheet program includes an easy-to-use menu and automatic column formatting. You can use *LEDGER* to do budgeting, sales forecasting, profit-and-loss projections and other "What if...?" calculations.

A four-color picture editor lets



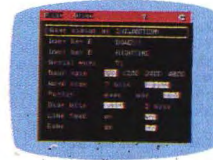
LEDGER

you create lines, shapes, patterns, fills in areas with color and enter text. Using *PAINT*, you can create colorful charts, graphs, designs and "doodles" on your screen, then print a copy on a dot-matrix or ink-jet printer.

The *INDEX CARDS* personal filing system lets you enter and edit data and perform simple sorts and searches. It's ideal for keeping track of names and addresses.



INDEX CARDS



TELECOM

TELECOM, a communications program lets you access national information services, plus transmit and receive files from other computers by phone (requires modem).

A simple monthly calendar program displays "to do's" for any date. *CALENDAR* is an easy way to organize your work day.



TEXT EDITOR

A four-function *CALCULATOR*, with memory, is also available within any application without interrupting the screen in the program you are currently using.

If you don't already have a disk drive for your color computer, you can add one for just \$299 (26-3131). The 5 1/4", thinline floppy drive plugs into your Program Pak® port for over 156,000 characters of storage. Add a second drive at any time, too.



CALENDAR

without interrupting the screen in the program you are currently using.



Radio Shack®
The Technology Store™

A DIVISION OF TANDY CORPORATION

Free! New 1986 Software Guide RSC-16.

Mail to: Radio Shack
Dept. 86-A-132, 300 One Tandy Center
Fort Worth, Texas 76102

Name _____

Address _____

City _____

State _____ ZIP _____

Phone _____

Price applies at Radio Shack Computer Centers and participating stores and dealers. DeskMate/Registered TM Tandy Corp.

Listing continued

```

241 IFP+J2=<L THENP=P+32:C=C+32
242 RETURN
243 W=Ø:V=V
244 Z=PEEK(V):IFZ>128ANDZ<>246ANDZ<>255THENZ=247
245 IFAS<>"X"THEN246ELSEIFPEEK(P)=246THENGOSUB265:GOTO249ELSE247
246 IFZ=255THENW=ØELSEW=W+1:IFW<G ORPEEK(P)=246THENW=Ø:GOSUB251:IFAS="Ø"THENPOKEC+1Ø24,PEEK(P):RETURNELSE248
247 C=C+1:P=P+1
248 IFC>511THENX=P-1:GOSUB23Ø:PRINTØ511,CHR$(Z):C=48Ø:Z=Ø:FORX=15Ø4TO1535:IFP+Z=L THEN249ELSEPOKEK,PEEK(P+2):Z=Z+1:NEXT
249 V=V+1:IFV<L THEN244ELSEIFP<L THENC=C+(L-P):P=L
25Ø RETURN
251 AS=INKEYS:IFAS="Ø"THENPOKEC+1Ø24,159:POKEC+1Ø24,191:POKEC+1Ø24,PEEK(P):FORZ=1TOØ:NEXT:GOTO251ELSEIFAS="Ø"ANDPEEK(P)<>246THENAS=CHR$(246):I=1:GOSUB22Ø:1-ØELSELIFAS="X"ANDPEEK(P)=246THENGOSUB265
252 IFAS=CHR$(12)ANDPEEK(P)=246THENGOSUB265
253 Z=Ø
254 IFAS<>CHR$(13)THENZ=2
255 IFPEEK(P)-246THENZ=Z+1:GOTO261
256 IFPEEK(P+2)=255THENZ=Z+1:GOTO261
257 IFPEEK(P+2)=96ORPEEK(P+2)>128THENZ=Z+1:GOTO256ELSEIFZ>ØTHENZ=2
258 IFPEEK(P+1)=255THENZ=Z+2:GOTO261ELSEIFPEEK(P+1)=96ORPEEK(P+1)>128THENZ=Z+2:GOTO256
259 Z=Z+1:IFPEEK(P-2)>128ORPEEK(P-2)=96THEN26ELSEIFZ<INT((G/4)THEN259ELSEC=C+1:P=P+1:GOTO262
26Ø C=C-(Z-1):P=P-(Z-1):V=V-Z:GOTO262
261 C=C+Z:P=P+Z:V=V+Z-1
262 IFAS=CHR$(13)ORAS="Ø"ORAS="X"ORAS=CHR$(12)ORAS=CHR$(246)THENRETURN
263 IFAS=CHR$(Ø)ANDZ>ØTHENP=P-1:C=C-1:V=V-1
264 GOTO251
265 Y=P:GOSUB229:X=USR1(C+1Ø24):L=L-1:V=V-1
266 IFL<P<512THENPOKEC+1Ø24+L-P,96
267 RETURN
268 FORX=15Ø4TO1535:IFP+Z=L THENRETURNELSEPOKEK,PEEK(P+2):Z=Z+1:NEXT:RETURN
3ØØ POKE2Ø2,1:CLS:PRINT"1. MARGIN"-"M:PRINT"2. LINE LENGTH"-"G:PRINT"3. LINES PER PAGE"-"N:PRINT"4. SPACE BETWEEN LINES"-"K:PRINT"5. PAGE NUMBERS"-"NG:PRINT"6. RETURN":PRINT:PRINT"CHOOSE (1-6)":PRINT
3Ø1 AS=INKEYS:IFAS="Ø"THENPOKE126Ø,159:POKE126Ø,191:GOTO3Ø1
3Ø2 POKE126Ø,96
3Ø3 IFAS="1"THENINPUT"MARGIN":M
3Ø4 IFAS="2"THENINPUT"LINE LENGTH":G
3Ø5 IFAS="3"THENINPUT"LINES PER PAGE":N

```

```

3Ø6 IFAS="4"THENINPUT"SPACE BETWEEN LINES":K
3Ø7 IFAS="5"THENINPUT"PAGE NUMBERS (YES/NO)":NS
3Ø8 IFAS="6"THENPOKE2Ø2,Ø:RETURN
3Ø9 GOTO3ØØ
4ØØ CLS:PRINT"PRINT":PS="":Y=Ø:V=Ø:W=M:T=1:R=1
4Ø1 FORX=S TO L-1
4Ø2 Z=PEEK(X)
4Ø3 IFV=LANDY=ØANDZ=96ANDPEEK(X-1)<>255THEN414
4Ø4 IFZ=246THENDS=PS+"-":GOTO413ELSEIFZ=255THEN413
4Ø5 IFZ>95ANDZ<129THENZ=Z-6ELSEIFZ>64ANDZ<91THENZ=Z+3ELSEIFZ>ØANDZ<27THENZ=Z+64
4Ø6 PS=PS+CHR$(Z):IFZ<129THENY=Y+1
4Ø7 IFY<G THEN414
4Ø8 IFZ>128ORZ=32THEN413
4Ø9 IFPEEK(X+1)=255ORPEEK(X+1)=96THENX=X+1:GOTO413
41Ø IFPEEK(X+1)>128THEN413
411 W=W+1:IFPEEK(X-W)>128ORPEEK(X-W)=96THEN412ELSEIFW<INT((G/4)THEN411ELSE413
412 X=X-W:PS=LEFT$(PS,LEN(PS)-W)
413 GOSUB416:PS="":Y=Ø:V=L:W=Ø
414 NEXTX:GOSUB416
415 GOSUB427:RETURN
416 IFPS="Ø"THEN425
417 IFØ=1THENPRINTØ-2,CHR$(14):
418 PRINTØ-2,TAB(M):
419 IFØ=1THENPRINTØ-2,CHR$(15):
42Ø FORP=1TOLEN(PS)
421 Z=ASC(MIDS(PS,P,1)):IFZ<129THEN424
422 IFZ=1Ø2THENZ=15:Q=1:GOTO424ELSEIFZ=185THENZ=14:Q=Ø:GOTO424ELSEIFZ=216THENZ=31ELSEIFZ=212THENZ=32ELSEIFZ=218THENZ=14ELSEIFZ=213THENZ=15ELSEIFZ=159THENZ=19ELSELIFZ=147THENZ=2ØELSEIFZ=145THENZ=21
423 PRINTØ-2,CHR$(Ø7):
424 PRINTØ-2,CHR$(Z):NEXTP
425 IFR=>N THENGOSUB427:PRINTØ-2,STRINGS(66-R,13):R=1ELSE R=R+K:PRINTØ-2,STRINGS(K,13):
426 RETURN
427 IFNS="Ø"THENRETURN
428 PRINTØ-2,STRINGS(57-R,13):PRINTØ-2,TAB(3Ø)"-T-":T=T+1:R=58:RETURN
5ØØ CLS:POKE2Ø2,1:PRINT"SAVE":PRINT:INPUT"READY TAPE TO RECORD AND ENTER NAME OF FILE":PS
5Ø1 GOSUB229
5Ø2 CSAVEN PS,9648,L-1,9648
5Ø3 POKE2Ø2,Ø:RETURN
6ØØ CLS:POKE2Ø2,1:PRINT"LOAD":PRINT:INPUT"READY TAPE TO LOAD AND ENTER NAME OF FILE":PS
6Ø1 CLOADM PS
6Ø2 L=PEEK(9648)*256+PEEK(9649)+1
6Ø3 POKE2Ø2,Ø:RETURN
7ØØ POKE2Ø2,1:CLS:PRINTØ16Ø,"TO RESUME: TYPE 'CONT' AND":PRINTTAB(11)"PRESS <ENTER>:STOP:POKE2Ø2,Ø:RETURN

```

End

1	Instructions
2	Type
3	Standards
4	Print
5	Save
6	Load
7	Stop

Table 1. Main menu.

Command	Print feature
Control S	Standard pitch
Control-P	Compressed pitch
Control C	Condensed pitch
Control-B	Boldfaced type
Control-E	Extended type
Control-U	Underlined type

Table 2. Printer codes used to highlight text.

Option	Standard	Default
1	Margin	7
2	Line length	66
3	Lines per page	55
4	Space between lines	1
5	Page numbers	No

Table 3. Default printout settings.

title. When you press control-U to exit underline mode, Type displays another control-code character.

Whenever you press the enter key, Type inserts the graphics character CHR\$(255) in text to signal a carriage return and line feed. To indent text for a new paragraph, press the enter key and then insert the appropriate number of blank spaces.

After you finish typing, press control-M to return to the main menu. Select option 3, Standards, to format your printout (see Table 3 for a list of default settings). When you choose options 1-4, you are

prompted to supply a value. If you want to print centered page numbers at the bottom of the page, select option 5 and answer yes in response to the prompt. Option 6 returns you to the main menu.

If a word won't fit at the end of a line, Type automatically prints it on the next line, unless you override wordwrap by inserting a hyphen. To do this, reselect option 2 from the main menu and type in control-H to call up hyphenate mode. The blinking cursor disappears momentarily, reappearing over the last character of the first line (determined by the line length you specified). If you want to

break a word, use the left arrow to backspace to the appropriate location and press the hyphen key to insert a marker (CHR\$(246)). Type then measures off the next line, and you can repeat the procedure. If you don't want to break a word, press the enter key to continue to the end of the next line. To delete a hyphen, use the clear key. To insert a single hyphen marker, type in control-H from insert mode. Typing in X from hyphenate mode deletes all end-of-line hyphens (marked by CHR\$(246)) occurring after the cursor.

When you are satisfied with your text, return to the main menu and save the file to tape, following the prompts. You can print out the file immediately by selecting option 4, or load the file from tape (option 6) at a later time. ■

Write to Nathan Roosth, 327 Winchester, Tyler, TX 75701.

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 auto-shifted (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**

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

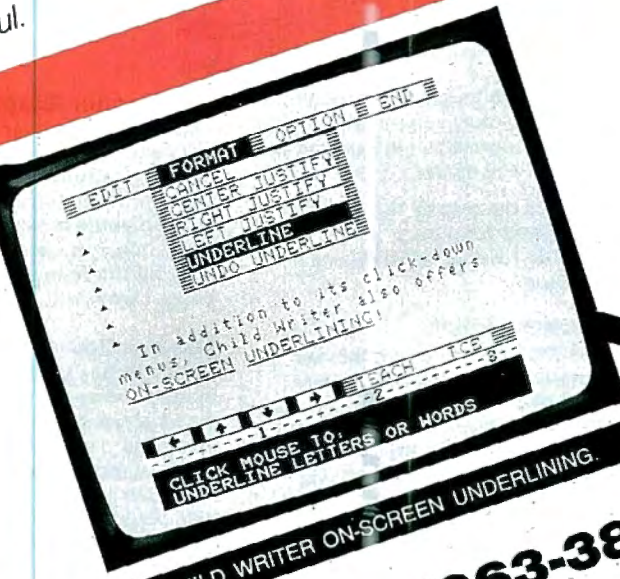
CHILD WRITER, our elementary word processor, is currently being used in schools by second grade children with amazing ease. Teachers tell us that kids are fascinated with the total control they have with a mouse. Just point and click! And we incorporated click-down menus to eliminate having to memorize 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.

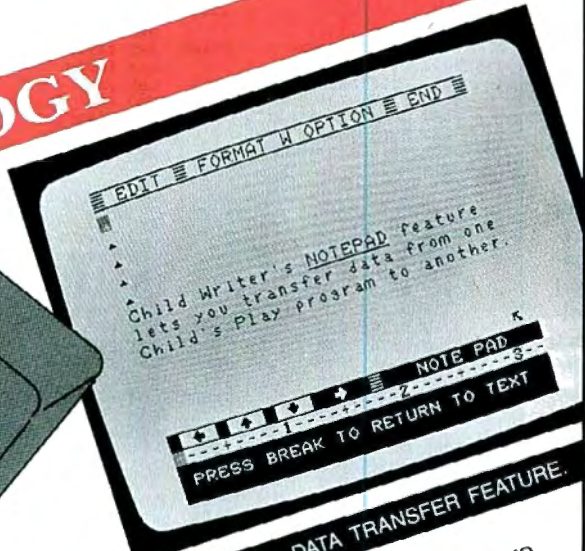
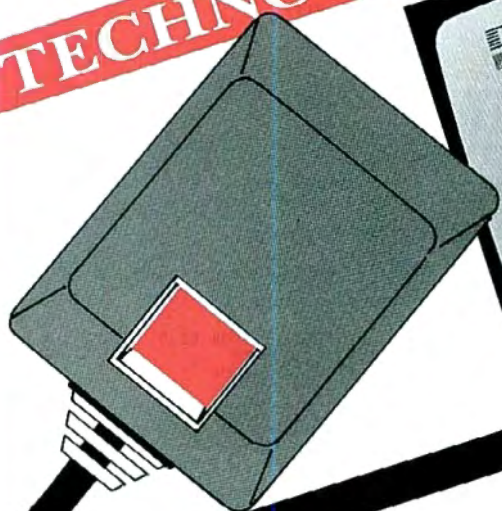
All of these programs, no matter what level of sophistication, are completely compatible with the other CHILD'S PLAY applications on the same level. And, data can be shared between applications by using our unique NOTE PAD feature.

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.

TECHNOLOGY



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.

Educational Level for the Radio Shack® Color Computer	
CHILD WRITER 32/64K disk (network version 32/64K)	\$54.95 / \$99.95
CHILD FILER 32/64K disk (network version 32/64K)	\$54.95 / \$99.95
CHILD CALC 32/64K disk (network version 32/64K)	\$54.95 / \$99.95
Elementary Level Series	TBA

MEMO WRITER 64K disk (network version 64K)	\$64.95 / \$129.95
LIST MANAGER 64K disk	\$64.95
SIMPLE CALC 64K disk	\$64.95
Home Use Level Series	TBA

BUSINESS WRITER 64K disk	\$99.95
BUSINESS MANAGER 64K disk	\$99.95
BUSINESS CALC 64K disk	\$99.95
Business Level Series	TBA

PROOFREADER (20,000 words) 32/64K	\$34.95
MASTER PROOFREADER (50,000 words) 64K	\$54.95

75 ADDITIONAL EDUCATIONAL SOFTWARE TITLES AVAILABLE



Circle 520 on Reader Service card.

Call us!
800/4TC-4TCE

Natural Selection

by Bob Helms

Having the latest computer equipment doesn't always mean you're getting the most from your computer. All too often, manufacturers' instructions don't tell you how to use their products effectively. Tandy's Multi-Pak Interface (catalog number 26-3124) is a good example. It has greatly expanded the capabilities of the Color Computer by allowing users to connect up to four program cartridges for software and peripherals; yet the documentation accompanying the Multi-Pak doesn't tell you how to eliminate crashes caused by slot switching.

Fortunately, you can overcome this deficiency if you have a basic understanding of hardware memory mapping and the Multi-Pak's slot selection features. I'll provide background information on the CoCo's input/output (I/O) functions and use PickaPak, an Assembly-language routine that lets you select a Multi-Pak Interface slot with a single keystroke, to show how you can make the Multi-Pak operate smoothly (see the Program Listing).

Mapping a Course

On a 64K CoCo, the bottom 32K (addresses zero through 7FFF hexadecimal) usually contains RAM (random-access memory); the top 32K (8000-FFFF) reserves space for the ROM (read-only memory), operating systems, and I/O ports. Since memory addresses FF00-FFDF contain the CoCo's I/O ports, standard devices (such as the keyboard and screen) and optional peripherals like the Multi-Pak Interface operate within this address range.

The parallel interface adapters (PIAs) and the synchronous address multiplexer (SAM) are the standard I/O devices. Each of the two PIAs contains four registers, which control most communication between the CoCo and the outside world. In the interest of simplifying hardware design, the CoCo's PIAs aren't

System Requirements

64K RAM
Extended Color Basic
Multi-Pak Interface
Editor/Assembler

Program Listing. Addresses are for Disk Extended Basic 1.0. Change the addresses for the NMI and IRQ handlers to D8A1 and D8AF (respectively) for version 1.1.

```

*****
* SUBROUTINE TO ALLOW SELECTION OF MULTI-PAK
* INTERFACE DEVICES WITH SINGLE KEYSTROKES.
* COPYRIGHT c 1985 BY
* BOB HELMS, AF5Z
* 434 W. ERCOUPE DR.
* MIDWEST CITY, OK 73110
*****
0002 0E00          ORG $0F00
0003 0E00 BDA928  START JSR $A928      CLEAR SCREEN
0004 0E03 8E0E4E  LDX #MENU      POINT X TO MENU
0005 0E06 A680    SHOW LDA ,X+      GET CHAR
0006 0E08 2706    RFQ KBD
0007 0E0A AD9FA002 JSR [$A002]    GO SHOW IT
0008 0E0E 20F6    BRA SHOW
0009 0E10 AD9FA000 KBD JSR [$A000]    GO READ KEYBOARD
0010 0E14 8131    CMPA #1        WAS 1 HIT?
0011 0E16 270E    BEQ ONE
0012 0E18 8132    CMPA #2        WAS 2 HIT?
0013 0E1A 270F    BEQ TWO
0014 0E1C 8133    CMPA #3        WAS 3 HIT?
0015 0E1E 270E    BEQ THREE
0016 0E20 8134    CMPA #4
0017 0E22 270F    BEQ FOUR
0018 0E24 20EA    BRA KBD        LOOP BACK IF ANYTHING ELSE
0019 0E26 8600    ONE LDA #0      SELECT SLOT 1
0020 0E28 200F    BRA ECB       GO SET UP BASIC
0021 0E2A 8611    TWO LDA #$11    SELECT SLOT 2
0022 0E2C 200B    BRA ECB
0023 0E2E 8622    THREE LDA #$22  SELECT SLOT 3
0024 0E30 2007    BRA ECB

* DISK CONTROLLER TO BE IN SLOT 4
FOUR LDA #$33    SELECT SLOT 4
      LDX $D7BC  DOS IRQ FOR V1.0
      BRA EXIT

ECB LDX $D894C  EXT BASIC IRQ FOR V1.0
EXIT ORCC $550  MASK INTERRUPTS
      STA $FF7F  SWITCH MULTI-PACK
      STX $10D  STORE IRQ VECTOR
      STA $FFDE  INSURE ROMS ARE ON
      STA $71   CAUSE COLDSTART
      ANDCC #SAF  RESTORE INTERRUPTS
      JMP SA027  GO COLDSTART
MENU PDB $0D00
      FCC #MULTI-PAK SLOT 1, 2, 3, OR 4 ?#
      PCB 0
      END START

```

NO ERRORS FOUND

End

fully address decoded; that is they don't use all 8 bits of the address bus. If a hardware device with fewer than the 8 address-decoded bits is placed on the bus, that device will respond to data at several different addresses.

If a PIA is fully decoded, it requires 4 bytes of address space for its four registers. Since the CoCo's PIAs use only 2 of the 8 bits, those four registers are repeated eight times, causing what are called "ghost" addresses. This makes each PIA consume 32 bytes of address space instead of 4 bytes. For example, the keyboard PIA at address FF00-FF03 also exists in 4-byte blocks beginning at FF04, FF08, FF0C, and so on.

Table 1 lists most addresses used by

commercially available I/O devices; however, it doesn't list all ghost addresses. Some CoCo peripherals are fully decoded and lack ghosts; others have PIA configurations similar to the CoCo's and thus have ghosts.

Shuffling the Pak

When you use the Multi-Pak Interface, you can avoid possible frustration by observing two simple rules. First, be sure to turn on the unit before turning on your CoCo; the cartridge in the Multi-Pak receives power from the interface, rather than from the CoCo. And to ensure compatibility with Tandy's software releases, put the disk controller cartridge in slot 4 as recommended in the Multi-Pak's in-

From Computer Plus to YOU...

PLUS after PLUS after PLUS



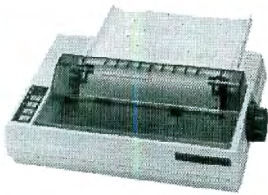
Tandy 200 24K \$649
Model 600 32K \$1269
Model 100 24K \$425



Tandy 3000 \$1969
Tandy 3000 HD \$2699



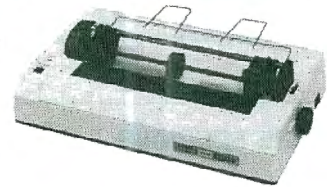
Tandy 1000 \$685
Tandy 1000 HD \$1539
Tandy 1200 HD \$1599



DMP-130 \$269



Color Computer II
w/64K Ext. Basic \$165



DMP-105 \$160

BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS

Tandy 1000 1 Drive 128K	685.00
Tandy 1000 HD 10 Meg. 256K	1539.00
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	269.00
Radio Shack DMP-430	660.00
Radio Shack DWP-220 Daisy Wheel	469.00
Radio Shack TRP-100 Portable	229.00
Silver Reed EXP-500 Daisy Wheel	229.00
Star SG-10	245.00
Star SG-15	410.00
Star SD-10	365.00
Panasonic P-1091	259.00
Panasonic P-1092	339.00
Toshiba 1340	439.00
Okidata 192	375.00
Epson LX-80	245.00
Epson FX-85	419.00
Epson HS-80 Portable Ink Jet	339.00

Tandy 1000/1200 ACCESSORIES

Tandy 1000 Disk Drive Kit	159.00
Tandy 1000 10 Meg. Hard Drive	579.00
Hard Drive Controller Board	249.00
256K Ram Board (inc. 128K & DMA)	199.00
512K Ram Board (includes 128K)	169.00
256K Memory Plus Expansion Brd.	249.00
PBJ Multi-Function Board (128K)	259.00
PBJ Multi-Function Board (256K)	279.00
PBJ Multi-Function Board (512K)	299.00
128K Ram Upgrade Kit (NEC)	78.00
256K Ram Upgrade (for PBJ Board)	69.00
300 Baud Modem Board	129.00
1200 Baud Modem Board	249.00
RS-232 Serial Board	89.00
Digi-Mouse/Clock Board	89.00

Tandy 1000/1200 MONITORS

Tandy VM-2 Green Monitor	129.00
Tandy CM-2 RGB Color Monitor	379.00
Tandy CM-4 RGB Color Monitor	249.00
Tandy VM-3 TTL Green Monitor	179.00
Tandy 1200 Text Monitor Adapt.	219.00
Tandy 1200 Color/Graphics Adapt	240.00

MODEMS

Radio Shack DCM-3 Modem	52.00
Radio Shack DCM-5 Modem	99.00
Radio Shack DC Modem 2212	315.00
Hayes Smartmodem II 300 Baud	169.00
Hayes Smartmodem 1200 Baud	429.00
Hayes Smartmodem 1200B	415.00

FOR EVERYONE

Network Four Outlet Surge Prot.	69.95
CCR-81 Cassette Recorder	52.00
CCR-82 Cassette Recorder	43.00
C-20 Digital Cassette Tapes (10pk)	9.95
Verbatim SSDD Plastic Box (10pk)	24.95
Verbatim DDDD Plastic Box (10pk)	29.95
Precision SSDD Diskettes (10pk)	15.95
Precision DDDD Diskettes (10pk)	17.95
NEC 64K Ram Chips (set of 8)	39.00
NEC 256K Ram Chips (set of 8)	69.00
Flip N File Disk 50	15.00
Fanfold CleanEdge Paper (2600)	35.00

Radio Shack software 10% off.
Send for complete listing of
brand name software and hardware.

**CALL TOLL FREE
1-800-343-8124**

- LOWEST POSSIBLE PRICES
- BEST POSSIBLE WARRANTY
- KNOWLEDGEABLE SALES STAFF
- TIMELY DELIVERY
- SHOPPING CONVENIENCE



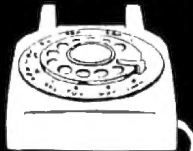
computer plus

P.O. Box 1094
480 King Street
Littleton, MA 01460

SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193

The Accessible Computer Experts



DELKER

HARDWARE SPECIALS

Tandy 600	CALL
Tandy 3000	CALL
25-1000 Tandy 1000 2-drive	CALL
Tandy 1000 10MB Hd	CALL
26-3802 Model 100 24K	\$ 449.95
26-3860 Model 200	\$ 849.95
26-3816P BK Upgrade Model 100	\$ 55.95
26-3127 64K Extended Coco 2	\$ 149.95
26-3129 Coco Drive	\$ 189.95
26-1161 Coco Drive 1	\$ 179.95
26-3124 Multi-Pac Interface	\$ 89.95
Video Monitor Adapters	\$ 34.95
Botek Ser / Par Interface	\$ 69.95
NAP Video Monitor (Grn Amber)	\$ 109.95
Extended Basic w/ bk	\$ 39.95
64K (DEI) Memory Upg	\$ 49.95
H.J.L Keyboard (D.E.F.2)	\$ 79.95
26-1276 DMP-105 Printer 80 cps	CALL
26-1278 DWP 220 Printer	CALL

MSI SOFTWARE

MSI DISKUTIL	NEW	\$ 19.95
COLOR FINANCE II	NEW	\$ 69.95
MSI NAMEFILE		\$ 24.95
MSI CALENDAR	NEW	\$ 19.95
MSI COLOR PAYROLL	NEW	\$ 99.95
COLOR FINANCE 4		\$ 69.95

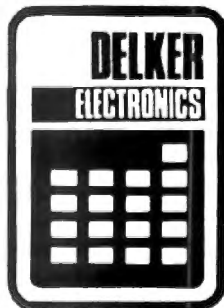
ACCESSORIES

Volksmodem 1200	\$299.95
RS D.C. Modem IB	\$ 89.95
Novation J-Cat Modem	\$129.95
USR Password 300	\$179.95
Hayes SM 300 Modem	\$239.95
USR Password 1200	\$399.95
USR Password 2400	\$599.95
CoCo Switcher	\$ 39.95
Elephant Disks ssdd	\$ 18.95
Mach II Joystick	\$ 39.95
26-3030 OS-9 (64k)	\$ 64.95 (disk)
Basic-09 (req. OS-9)	\$ 87.95 (disk)
"C" Compiler (OS-9)	\$ 87.95 (disk)
FHL O-Pak (req. OS-9)	\$ 34.95 (disk)
Eite Word	\$ 59.95 (d&c)
Elite Calc	\$ 59.95 (d&c)
Color Term Plus	\$ 29.95 (cass)
Delt Pascal	\$ 79.95
26-3012 Deluxe Joystick	\$ 34.95
Tandy 1000 options	CALL

NEW! Dual Double Sides Drives including case, power supply & cable \$375.95

NEW! 26-3128 64K Direct Video CoCo2 \$219.95

TRS-80 Trademark Tandy Corporation
Prices subject to change without notice
Write for our FREE newsletter



Call for prices and availability of your favorite software and hardware. All advertised items subject to availability. Prices do not include shipping and handling. All of the above units are covered by our 120 day carry-in warranty

DELKER ELECTRONICS, INC.
P.O. Box 897 408 C Nissan Blvd.
Smyrna, TN 37167

- 800-251-5008 ■ 615-459-2636 (Tennessee)
- 800-545-2502 ■ 615-254-0088 (Nashville)

Visa, Mastercard and American Express

HOT CoCo

Address	Supplier	Device
FE00-FE7F	GA	Future enhancements
FE80-FE83	GA	Parallel printer port
FE90-FEFF	GA	Peripheral interface cards
FF00-FF1F		PIA0 keyboard
FF20-FF3F		PIA1 RS-232, VDG, and sound
FF24-FF27	CS	Parallel printer PIA
FF40		Disk controller control register
FF48-FF4B		Disk controller command, track, sector, and data registers
FF40-FF5F	DK	Color Burner
FF40-FF46	CS	EPROM programmer
FF60-FF63	RS	X-Pad
FF64-FF67		
FF68-FF6B	RS	RS-232 Pak
	PBJ	2-SP Port #1
FF6C-FF6F	PBJ	2-SP Port #2
FF6E-FF6F	SS	Real-time clock
FF70-FF73	SS	Stereo Pak
FF74-FF77	SS	SC-01 Voice
FF78-FF7B	SS	EARS
FF7C	PBJ	C-C bus slot selection
FF7D-FF7E	RS	Speech/sound cartridge pack
	PBJ	C-C bus ghost
	RS	Multi-Pak slot selection
FF7F	PBJ	C-C bus ghost
FF80-FF83		
FF84-FF87		
FF88-FF8B		
FF8C-FF8F		
FF90-FF93	PBJ	PC-Pak parallel
	CO	CoCo Max
FF94-FF97	PBJ	PC-Pak real-time clock
	CO	CoCo Max
FF98-FF9B	PBJ	Word-Pak
	CO	CoCo Max ghost
FF9C-FF9F	PBJ	Word-Pak
	CO	CoCo Max ghost
FF9F	RS	Multi-Pak slot selection ghost
FFA0-FFA3		
FFA4-FFA7		
FFA8-FFAB		
FFAC-FFAF		
FFB0-FFB3	CO	CoCo Max ghost
FFB4-FFB7	CO	CoCo Max ghost
FFB8-FFBB	CO	CoCo Max ghost
FFBC-FFBF	CO	CoCo Max ghost
FFC0-FFDF		SAM

Distributors

- Colorware (CO), 78-30B Jamaica Ave., Woodhaven, NY 11421.
- Colin Stearman (CS), See *Rainbow*, July 1984 and February 1985.
- Denris-Kites (DK), See *Color Computer Magazine*, March 1984 and June 1984.
- General Automation (GA), 9600 Roosevelt Blvd., Philadelphia, PA 19115.
- PBJ Inc. (PBJ), P.O. Box 813, North Bergen, NJ 07047.
- Radio Shack (RS), One Tandy Center, Fort Worth, TX 76102.
- Speech Systems Inc. (SS), 38W255 Decrpath Road, Batavia, IL 60510.

Table 1. Input/output memory map for the CoCo.



“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 1986 Software Reference and Computer Guide. We've got classic programs for every taste!

Radio Shack®
The Technology Store™

A DIVISION OF TANDY CORPORATION

New 1986 Computer Catalog.

Mail To: Radio Shack, Dept. 86-A-987A
300 One Tandy Center, Fort Worth, TX 76102

Name _____

Address _____

City _____

State _____ ZIP _____

Phone _____

Prices apply at Radio Shack Computer Centers and at participating stores and dealers. Dynacalc/TM Computer Systems of St. Louis. OS-9/TM Microware and Motorola, Inc. Dynacalc contains no artificial additives.

Circle 75 on Reader Service card.

POKE Address	Value	Slot Number
FF9F or FF7F	00	1 (front)
	11	2
	22	3
	33	4 (rear)

Table 2. Multi-Pak Interface software slot selection.

Vector	Interrupt	CB	ECB	DECB
100	SWI3	*	*	3B3B
103	SWI2	*	*	3B3B
106	SWI	*	*	*
109	NMI	*	*	D7AE
10C	IRQ	A9B3	894C	D7BC
10F	FIRQ	A0F6	A0F6	A0F6

Table 3. The CoCo's interrupt structure. Asterisks indicate that the interrupt handler is not defined.

structions. If you have trouble with your interface, consult the Radio Shack Multi-

Pak Interface Service Manual. Don't worry about color—the gray and white

Multi-Paks are electrically identical.

You can control slot selection with hardware or software. Hardware selection is straightforward: Reset the switch to select another slot. At its simplest level, software selection involves POKEing the slot value into the appropriate address to override the Multi-Pak's switch (see Table 2). (The most-significant nibble [leftmost digit] of the POKE value selects the expansion ROM at C000-DFFF; the least-significant nibble [rightmost digit] selects the I/O device at FF00-FFDF.) This allows you to select the expansion ROM and I/O device separately.

For example, you can install a disk controller in slot 4 and an EPROM programmer in slot 1. Choosing slot 4 and turning on the system installs the disk operating system. Once you've loaded and run software from disk, you can type in POKE&HFF9F,&H30 to switch to slot 1. The disk ROM in slot 4 will continue to function but I/O is redirected to the EPROM programmer, thus disabling the I/O portion of the disk controller. To reselect slot 4 for both the expansion ROM and I/O memory areas, type in POKE&HFF9F,&H33.

This technique also works with both the disk controller and EPROM program-

Circle 281 on Reader Service card.

Circle 449 on Reader Service card.

IT'S LIKE
FREE DISKETTES

Your 5 1/4" single side disks are usable on the other side. You paid for one side, why not use the other... **IT'S FREE!**
Nibble Notch will **open** your new disk. It's easy... won't harm existing data. Try it, you'll be glad you did!

U.S. PAT. 4,488,358

nibble notch II

Cuts square notch and 1/4" round "index hole." For TRS 80 I, II, and IV, Osborne, TI, Kaypro, IBM and others needing "index hole."

Call for **HIGH QUALITY DISKETTES** as low as **99¢**

ONLY \$21.90*
PLUS P&H

SATISFACTION GUARANTEED OR YOUR MONEY BACK!
TOLL FREE 1-800-642-2536

215-527-1553, 9 am-6 pm ET
or send check
or money order to:

nibble notch®
computer products

707 Matson Ford Rd. Villanova, PA 19085
Shuffle Buffer PKASO U from Interactive Structures
Available: Call for Prices

*Add \$2 (\$5 foreign) for postage & handling.
PA residents add 6% Sales Tax.

ORDER TODAY

VISA MasterCard

PROFESSIONAL HANDICAPPING SYSTEMS

• PRESENTED BY PROFESSOR JONES •

GLD. Thoroughbred "Gold" Edition™
A "Full" featured thoroughbred analysis designed for the professional and the serious novice
\$159.95 complete

EGLD. Enhanced "Gold" Edition™
"Gold" Edition with complete Master Bettor™ system integrated onto the same disk. This powerful program will transfer all horses and scores to the bet analysis with a "single keystroke."
(Master Bettor™ included) **\$199.95 complete**

GLTD. Limited "Gold"™
Enables Professional Handicappers to assign specific values to the racing variables they feel are important. Create program weight based on a particular track and fine tune it for maximum win percentage. This program is designed for "ease of use." The user needs no programming experience.
(contains Integrated Bettor™) **\$299.95 complete**

GD. Gold Dog Analysis™ \$149.95
The ONLY professional greyhound analysis w/integrated Bettor **\$199.95**
available that evaluates ALL variables Limited Version **\$299.95**

MHH. Master Harness Handicapper™
Professional software designed to provide a thorough analysis of all trotter and pacer races in the United States and Canada
complete **\$159.95**
w/integrated Bettor **\$199.95**
Limited **\$299.95**

Professor Pix Football™
Complete STATISTICAL ANALYSIS ON Data Base allowing "Designed" previous games to be evaluated
Statistical Series **\$99.95**
w/Win-Loss Power Ratings **\$149.95**

NBA. Basketball™
NBA **\$99.95** w/college **\$129.95**
w/power ratings **\$149.95**

LOT. Lottery Analysis™
Statistical comparison program designed to detect subtle patterns in winning numbers and digits.
Lottery (3-4 digit) **\$79.95**
w/Lotto (Max. 99 Digit) **\$99.95**

PC-3 Portable Computer (4k) w/choice of Thoroughbred, Greyhound or Trotter™ **\$249.95** (Includes portable computer & program.)

M-100 Portable (32k) w/choice of Thoroughbred, Greyhound, or Trotter and Master Bettor **\$649.95**
(Includes portable computer and program.)

FREE CATALOG!

★★★★★
"Your BEST BET in handicapping software..."

Reviewed by:
Whole Earth Software Guide
Corona Data Systems

Prof. Jones
1940 W. State
Boise, ID 83702

VISA MasterCard
AMEX

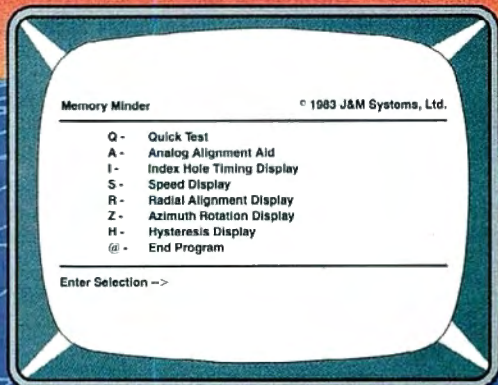
48 HR. FREE SHIPPING

CALL (208) 342-6939

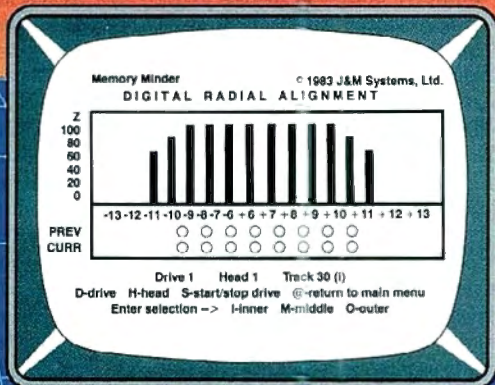
TERMS: Free shipping all software. Add \$6.00 hardware/\$6.00 C.O.D. / UPS Blue \$6.00/Out of Country \$9.00/ID. Residents 4% 3 weeks personal checks/Cash price only, add 2% Visa, MC, AMEX. Prices subject to change.

MEMORY MINDER T.M.

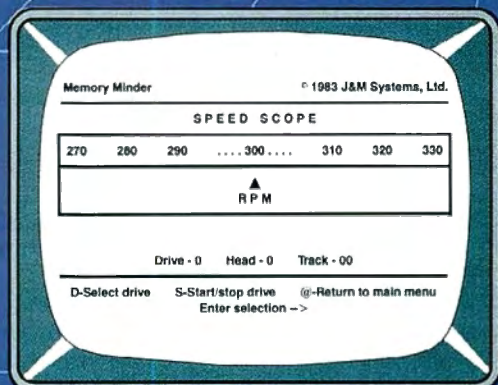
... A UNIQUE APPROACH TO DISK RELIABILITY!



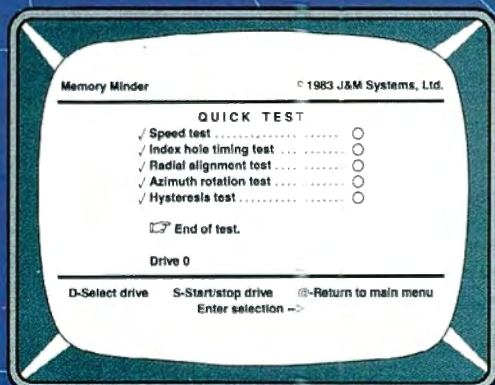
Select any one of seven tests to perform preventive maintenance or to isolate problems. Simple, single-letter commands make MM easy to use! Use MM to align the head, adjust the index hole detector, or adjust the speed.



Use the MM Radial Alignment Test to check the head alignment of your drives. No need for an oscilloscope or other expensive test equipment!



Check the motor speed of your drives. Or, you can even use the Speed Test to adjust the drive speed. No need for any test equipment!



Use the Quick Test to quickly and automatically test five of the most important performance parameters of your drive. Monitor your drives for long term drift. Isolate problems quickly and automatically!

PROTECT YOUR DATA.

Now you can make sure your data is being recorded properly by the use of the revolutionary **Memory Minder**.

The Memory Minder from J & M Systems, tests your disk's performance and calibration without any additional equipment! It measures your disk's performance and displays it on your screen.

This is the most comprehensive disk diagnostic program available for your TRS-80 microcomputer. You can even adjust drive alignment while watching the display!

Spot problems *before* they endanger your data! If you own a disk drive, you *need* the **Memory Minder!**

	Price #
TRS-80 Model III/4	
1 - 48 tpi Single Side (Standard)	\$79
2 - 48 tpi Double Side	\$89
3 - 96 tpi Double Side	\$129
Includes 48 tpi & 96 tpi program diskettes	
TRS-80 Model -I	
1 - 48 tpi Single Side Single Density	\$89
TRS-80 Color Computer and TDP-100	
1 - 48 tpi Single Side (Standard)	\$79
2 - 48 tpi Double Side	\$99

MM also available for other models
J & M SYSTEMS IS THE DRIVING FORCE!



J & M SYSTEMS, LTD.
15100-A CENTRAL SE
ALBUQUERQUE, NEW MEXICO 87123
505/292-4182

mer using the FF40 address range, since each device functions only if its slot is selected. You may POKE values to either FF7F or FF9F because of ghosts located there, but you can't PEEK the latch register at those addresses—it will always return an FF.

Unfortunately, both the switch reset and POKE technique can interfere with Basic's interrupt-handling routines, forcing you to reset the computer. For instance, if you're operating under Disk Extended Color Basic, both NMI (non-maskable interrupt) and IRQ (interrupt request) interrupt handlers are present in the disk ROM. Switching slots on the Multi-Pak deselects the ROM, so the next interrupt sends the system into space. Table 3 shows the addresses of the interrupt handlers in Color Basic 1.1 (CB), Extended Color Basic 1.0 (ECB), and Disk Extended Color Basic 1.0 (DECB). The

vectors to direct the central processing unit to those addresses reside in low RAM.

Take Your Pick

PickaPak combines software slot selection with interrupt control, eliminating the need for resets and allowing you to select a slot with one keystroke. After typing in the Listing, assemble and run the program. The opening prompt asks you to select a slot. When you choose slot 4 from a cold start, the CoCo selects Disk Extended Color Basic; for all other slots, it selects Extended Color Basic. By controlling interrupts, PickaPak prevents the system from crashing before a new ROM is selected. To reset the slot (provided you haven't overwritten PickaPak in memory), type in EXEC&HOE00 to call up PickaPak's selection menu.

The Multi-Pak Interface selects slots by placing specific logic levels on the

CTS, SCS, and CART control signals of the CoCo bus. All addresses, data power, and other control signals go to all four slots of the Multi-Pak at all times. This allows devices like PBJ's Word-Pak and 80-column board and Tandy's RS-232 cartridge to function continuously, regardless of the slot selected. PickaPak controls the selection of Multi-Pak slots but doesn't control slot-independent devices such as these. A device that doesn't rely on CTS, SCS, or CART control signals will function in any slot, regardless of the slot selected.

Program packs that are auto-starting will remain so. Because a jumper on the program pack's circuit board provides an immediate interrupt, auto-starting cartridges don't allow Basic to coldstart. ■

Write to Bob Helms, 434 W. Ercoupe Drive, Midwest City, OK 73110.

Check PPoint

Send your letters, club and BBS notices, and requests for assistance to Check PPoint, 80 Micro, 80 Pine St., Peterborough, NH 03458.

Master Mindbuster

Abe Feigenbaum of Hopatcong, NJ, has won a Mindbusters Puzzle Contest for the second time. The Figure shows his winning entry in Contest VIII, a word game called Crosscut that was published in the December 1985 issue of HOT CoCo. Feigenbaum also won Contest III. For his latest triumph, he'll receive a one-year subscription to 80 Micro.

—Eds.

Seeking Help

► David Prescott (Physics Dept., Rutgers University, Camden, NJ 08102) seeks a way to run Okidata's Okimate 20 printer with the IBM PC Plug 'n Print serial interface on the CoCo. He also needs hardware requirements for the Okimate's print head controller so he can build a CoCo interface himself.

► David C. MacGregor (RD#2, Box 302B, Barnsboro, NJ 08080) wonders how to get right-justification on the Radio Shack DMP-110 printer using the embedded codes in Cognitec's Telewriter-64.

► Dale Keefe (13 Second Ave., P.O. Box

W	A	P	P	O	R	T	I	O	N	M	E	N	T
H	P	R	O	F	O	U	N	D	A	D	O		
I	M	P	O	R	T	A	B	L	E	P	I	T	Y
M	R	U	T	C	A	Y	S		T	O	O		
	M	O	D	I	S	H			S	W	O	R	N
Z	E	A	L	O	T	G	A	Y	A	R	I	D	
I	C	Y	N	I	C	A	L	B	R	I	O		
R	A	H	S	L	U	M	P		D	A	U	B	
C	R	A	P	L	I	B	W	A	I	L	S		
O	R	B	I	T	N	O	D	I	N	G			
N	A	I	L	I	G	L	U	S	G	A	M	Y	
I	S	L	A	N	D	S	C	O	W	M	O	P	
U	I	F	I	N	A	N	B	O	W	S			
M	A	T	F	O	U	N	T	P	U	N	N	Y	
	M	Y	A	M	B	U	S	H	I	N	G		

Figure. Abe Feigenbaum's winning Crosscut entry.

643, Windsor, Newfoundland, Canada A0H 2H0) wants advice on setting up a CoCo user's group.

► Janet Wilbanks (P.O. Box 671, Trion, GA 30753) is looking for software for designing cross-stitch patterns and charts on her 64K Color Computer 2.

► Matt Bowman (1802 N. Amelia St., Sterling, VA 22170) wants advice on expanding his 16K Color Computer 2 to 64K without buying a Radio Shack kit.

► Liz Wegner (RR 4, Box 197, Richland Center, WI 53581) is unsure if her Radio Shack Pyramid adventure game (cassette) runs correctly on her Color Computer 2. She is unable to score the final 20 points and needs advice from people who have done so.

Drill and Practice

I developed MATHDRIL, a short Color Computer program to help children aged six to 11 improve their addition, subtraction, multiplication, and division skills (see the Program Listing). (For the MC-10, change the value of the POKE in line 110 to 16383.)

When you run MATHDRIL, the opening screen asks which mathematical operation you want to test. The second prompt requests the speed from one to 20—the higher the number, the longer the

PERRY COMPUTERS



CALL
1-800-248-3823

COLOR COMPUTERS	LIST PRICE	OUR PRICE
26-3127 64K Extended Color Computer 2	\$199.95	\$169.00
26-3134 16K Standard Color Computer 2	119.95	99.00
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

TANDY 3000	LIST PRICE	OUR PRICE
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
25-3046 Deluxe Text Display Adapter	249.95	205.00
26-3047 Deluxe Graphics Display Adapter	499.95	395.00
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
25-4060 Hard Disk Controller Board for 3000	499.00	425.00
25-4062 20 Meg Hard Disk Kit	799.00	679.00
25-4101 MS-DOS 3.1/Basic/DeskMate	99.95	85.00
26-5111 VM-1 Monochrome Monitor	199.95	165.00
26-5112 CM-1 Color Monitor	599.95	510.00

TANDY 100, 200, 600	LIST PRICE	OUR PRICE
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

MODEL 4D	LIST PRICE	OUR PRICE
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

MODEL 6000 COMPUTERS	LIST PRICE	OUR PRICE
26-6021 Model 6000 512K 2 FD Comp	\$4499.00	\$3125.00
26-6022 Model 6000 512K 1 FD 15 Meg HD	5499.00	3795.00
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
26-4155 15 Meg Hard Drive Primary	1595.00	1355.00
26-4171 35 Meg Hard Drive Primary	2995.00	2545.00
26-4173 70 Meg Hard Drive Primary	4295.00	3350.00
26-4157 Installation Kit for Primary HD	349.00	295.00

RADIO SHACK PRINTERS	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

TANDY 1200, 2000	LIST PRICE	OUR PRICE
25-3000 Tandy 1200 One FD & 10 Meg HD	\$1999.95	\$1525.00
25-3001 Tandy 1200 Two FD 256K	1499.00	1200.00
25-3010 VM-3 Green Monitor	219.95	185.00
25-1022 CM-10 Color Monitor	459.95	380.00
25-3043 Graphics Display Adapter	299.00	185.00
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
26-5103 Tandy 2000 Two Disk	1599.00	1225.00
26-5104 Tandy 2000 One Disk & 10 Meg HD	2499.00	1885.00

TANDY 1000	LIST PRICE	OUR PRICE
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
25-1006 RS-232C 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
25-1021 CM-4 Color Monitor	299.95	225.00
25-1022 CM-10 Color Monitor	459.95	380.00
26-3211 VM-2 Monochrome Monitor	149.95	125.00
30051030 PJB Multifunction Board 512K		310.00

EPSON PRINTERS	LIST PRICE	OUR PRICE
20001015 Homewriter 10	\$288.00	\$215.00
20001025 LX-80 Dot Matrix Printer	299.00	225.00
20001035 FX-85 Dot Matrix Printer	499.00	345.00
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	749.00	510.00
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

Mon., Wed. & Fri. 9-9, Tues. & Thurs. 9-6, Sat. 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.

allowed response time. The next prompt asks for the number of permissible

chances from one to five. This choice determines how many wrong answers the

student is allowed before the game ends.

Typing G (go) at the next screen brings up 10 blocks, each containing a problem. A cursor marks the top block of the 10-block pyramid. The problems use the numbers one through nine; responses must be two-digit numbers (e.g., $2 + 1 = 03$).

A correct response clears the block, and the cursor moves to the next problem. If the student fails to answer a problem within the time limit or gives an incorrect answer, the correct answer appears in that block. The game continues until the student exceeds the number of permissible wrong answers. At the end of the game, the score—the number of correct responses—and the time appear at the top of the screen. The program then returns to the go/quit screen. ■

Danny Nelson
Wetumpka, AL

Pardon Us

An error crept into our listing of Alain Dussault and Luc Jacob's ZapZ program ("A Fine Fix," 80 Micro, March 1986, p. 120). In Program Listing 1, line 1610 should end with THEN 1640, not THEN 160 as printed.

—Eds.

Program Listing. MATHDRIL.

```

1# PRINT@,":PRINT" 1 = "+:PRIN
T" 2 = -:PRINT" 3 = **:PRINT" 4
= /:PRINT" 1-4":INPU
T O,IF OC1 OR O>4 THEN 1#
2# OS(1)="+:OS(2)=-:OS(3)="+:
:OS(4)="/:
3# INPUT"SPEED 1-2#";T:IF T<1 OR
T>2#THEN 3#
4# INPUT"NUMBER OF CHANCES 1-5";
CH:IF CH<1 OR CH>5THEN 4#
5# DATA1,3,137,145,261,269,277,38
5,393,4#1,4#9
6# FOR F=1TO1#;READL(F);NEXT
7# CO=3:S=#:WR=#:CV=CH:T1=12#
8# CLS#;PRINT@32*3+14," Q E ":P
RINT@32*5+12," BY ":PRINT@
32*7+9," DANNY NELSON ":PRINT@
32*9+6," G TO GO : Q TO QUIT ";
9# OS=INKEY$:IF OS="C"THEN 1#
91 IF OS="Q" THEN CLS:END
92 GOTO9#
1# CC=127+16*CO:CLS#
1# FOR F=1TO1#;FOR P2=#TO2#;FOR
F3=1TO6#;FOR F1=2#+(P2*32)+F3+L(F
),CC:NEXTF3,F2
12# P=RND(9):P1=RND(9):P1S=RIGHT
$(STR$(P1),1)
13# IF O=1 THEN A(F)=P+P1:PS=RIG
HT$(STR$(P),1)
14# IF O=2 THEN A(F)=P:PS=RIGHTS
$(STR$(P+P1),2)
15# IF O=3 THEN A(F)=P*P1:PS=RIG
HT$(STR$(P),1)
16# IPO=4THENPS=RIGHT$(STR$(P*P1
),2):P2S=PS+*/:P1S:A(P)=P
17# P2S=PS+OS(O)+P1S
18# PRINT@L(F)+1,P2S;
19# NEXT
2# QHS=CHR$(127+CO*16-4)+CHR$(1
27+CO*16-14)
21# IF CV<1 THEN FOR FF=1TO CV-
1:PRINT@32+(FF*2),CHR$(127+CO*16
-12)CHR$(127+CO*16-12)CHR$(127+1
6*CO-13);:PRINT@64+(FF*2),QB$CHR
$(127+16*CO-5);:NEXT
22# FOR F=1TO 1#
23# PRINT@#, "SCORE = "S;
24# PRINT@22,"TIME= " ";
25# PRINT@L(F)+64+2,QBS;:SOUND 1
#,#,1:SOUND#,#,1
255 ANS="" :FOR F1=1TO T*25:AS=IN
KEY$
261 IF AS<"# OR AS>"9" AND AS<
CHR$(13)THEN PRINT@27,T1-INT(F1/
25);:NEXT
265 IF AS="#" OR AS<"9" AND AS
=CHR$(13) THEN SOUNDS#,#,1:ANS=AN$
+AS;IF LEN(ANS)<2 THEN NEXT
27# SOUND 5# ,1:IF VAL(ANS)>A(F)
THEN 29#
28# S=S+1:FOR FF=#TO2:PRINT@L(F)
+FF*32,CHR$(159)CHR$(159)CHR$(15
9)CHR$(159)CHR$(159)CHR$(159);:N
EXT:GOTO32#
29# WR=WR+1:PRINT@L(F)+65,A(F);
FOR FF=1TO 1# STEP 1#;SOUND1#,#,
1:SOUND1#,#-FF,1:NEXT
3# IF CV=WR THEN PRINT@22,"?*/?
1?"#?";:GOTO 3#
31# PRINT@WR*2+64,CHR$(CC)CHR$(C
C);
32# IF P2/25<1 THEN F2=25
33# T1=INT(F2/25):IF T1<1 TH
EN PRINT@22," TIME UP ";:GOTO 3#
335 NEXT F
34# CO=CO+1:IF CO=9 THEN CO=3
35# CV=CV-WR:WR=#:GOTO 1#
36# PRINT@32+22,"GAME OVER ";:SO
UND1,2#;FOR F=1TO3#;NEXT:GOTO7
#

```

End

Circle 538 on Reader Service card.

1986 BEST OF THE UPGRADES LIST

- Memory 64K DRAMS . . . from . . . \$ 19
256K Kits 98
- ROM/BASIC Color Basic 1.2 \$ 19
Extended Basic 1.1 29
Disk Basic 1.1 29
ADOS 40
- Storage Drive 0 \$209
Drive 1 (external) 135
Drive 1 (internal) 80
- Controllers J&M (you supply DOS) \$ 89
'Super Controller' 95
- Monitor Driver Original Coco . . . \$ 24
Coco II 34
- Monitors Hi-Res Green/Amber . . . \$ 89
Color with audio 169
- Lower Case Kit \$ 49
- Deluxe Keyboards . . . from . . . \$ 59

Please specify model or cat # of your CoCo when ordering. Brands and prices subject to stock availability. Send for free price list on over 200 Coco items.



POLYGON COMPUTERS
1316 Wilshire Blvd., Suite 206
Los Angeles, CA 90017
(213) 483-8388



Ca. Res. 6 1/2% tax
Visit our Retail Store

Shipping: \$2 Software
Charges: \$5 Hardware

Circle 456 on Reader Service card.



DAISY WHEEL New Smith Corona L-1000

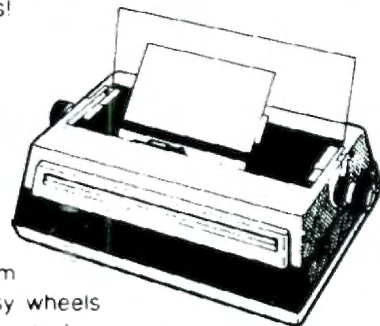
True letter quality printer for less than the cost of an office typewriter! Priced \$500 less than other popular daisy wheel printers!

SALE PRICE:

\$249

FEATURES:

- ★ Friction feed
- ★ 15 cps. 120 wpm
- ★ Changeable daisy wheels
- ★ Parallel or serial interface
- ★ Compatible with R/S. Apple, etc



SUNLOCK SYSTEMS

210 Connor Rd.
Mechanicsville, Va. 23111

We accept
MasterCard,
Visa and CODs

ADDITIONAL PRINTER SPECIALS

Epson DX10 \$249	Okidata ML83 \$499	ComrexCR11 \$299	Citoh 7500 \$239
LX80 229	ML192 369	Star SG10 239	Citoh F1040 849
L1500 899	ML84 649	Star P.TYPE 319	Citoh 1550 449
FX85 359	ML193 519	Star SR 10 499	Citoh8510SP 379
FX185 499	ML93 509	Star SD 10 349	Cannon 1092 389
JX 80 499	ML182 239	Star SG 15 399	Citizen M10 279
			Tshiba 351 1099

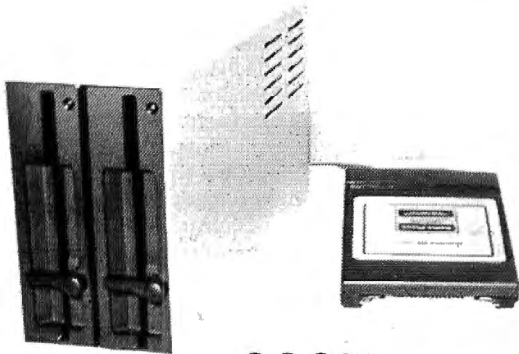
TO ORDER CALL TOLL FREE 800-368-9191
In Virginia call 804-746-1600



64K EXT. BASIC 139⁹⁵

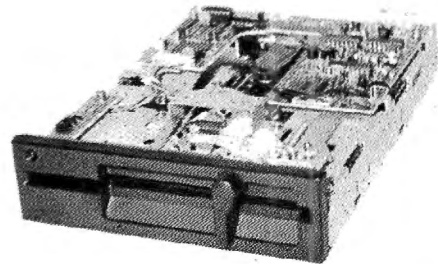
Color Computer II

Monitor Interface for above CoCo II 29.95 plus 7.50 installation. (color & green compatible)



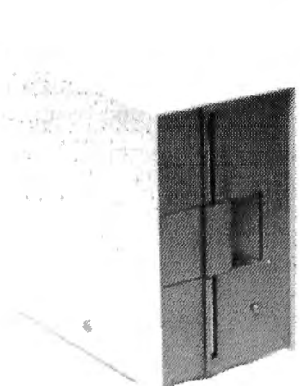
2 Drives 299⁹⁵

Both our drive 0 and 1 in one case, with cable and R.S. controller. The best just got better!



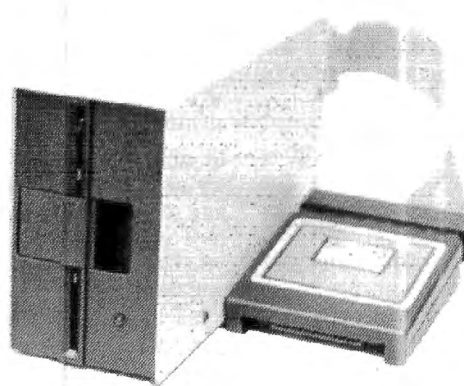
Drive 1 Upgrade 119⁹⁵

Add a second 1/2 height drive to your Radio Shack 26-3129. Comes with 3 minute installation instructions, screwdriver required.



Drive 1 \$129⁹⁵

Your Choice
Silver or White



\$199⁹⁵ 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, add 45.00 (only for those who have DS-DOS, boards and knowledge) Bare full hgt SSDD drive only 79.95. (PRICES SUBJECT TO CHANGE)

THE COMPUTER CENTER

901-761-4565, 5512 Poplar, Memphis, TN 38119

In Continental U.S. add \$4.90 for shipping and handling—Visa, MC & money orders accepted

Allow an additional 2 weeks for personal checks—Drive faceplates may vary slightly

Doctor ASCII

by Richard E. Esposito and Ralph E. Ramhoff

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.

Q: I followed the procedure to enable 64K outlined in "64K Revisited" (HOT CoCo, June 1985, p. 40), but I still got 24871 after typing in PRINT MEM. Where is my extra memory?

Also, when I was doing part 6 of program 9 in Don and Kurt Inman's *Assembly Language Graphics for the TRS-80 Color Computer*, I discovered that the CoCo 2 doesn't have keyboard roll-over. I found a fix for one program, but I'd like a general fix. (William G. Bush, Greenville, PA)

A: Your memory is all there, but you must use machine language to get it. The Basic interpreter uses various parts of memory. In fact, you can use only 8K of the upper 32K of RAM if you want Disk Extended Color Basic (DECB) to remain active. If your machine-language program doesn't need DECB's ROM routines, you can use 63.75K of memory (up to FFFF hexadecimal). The remaining 256 bytes are reserved for hardware status registers.

Your second problem is really two problems. The program you mentioned in Inman's book doesn't involve the roll-over table; it goes directly to the keyboard PIA (parallel interface adapter) registers to determine whether the key is being pressed.

Unfortunately, there is no universal fix to correct the keyboard roll-over problem. ROM routines in older machines cleared the roll-over table; in the CoCo 2, Tandy decided to clear the table only when the keyboard was about to be read. For Basic programs, you can call the INKEY\$ function whenever you want to clear the table. You can also use the following routine:

```
FOR K = 341 TO 345:POKE K,255:NEXT K
```

Q: In "Best Bets for Christmas" (HOT CoCo, December 1985, p. 42), you indicated that eight 4164 mem-

ory chips can be bought for under \$10. Where can I get them? (Emil Franklin, Idaho Falls, ID)

A: All CoCos—except for the latest Korean machine—require eight 4164 (or 64K by 1-bit) RAM chips. The newer Korean CoCos (identified by a final A or B on the part number) require two 64K by 4-bit RAM chips. The suppliers listed in Table 1 sell these chips.

Semiconductor prices fluctuate; call for a current price.

Q: I can't understand the explanations of PEEK and POKE in the Tandy manuals. Can you help? (Lane Ladd, Alameda, CA)

A: The PEEK function instructs Basic to read the value of a specific byte in memory and use that value in place of the PEEK function call. A POKE tells Basic to store a specific number at a particular memory location. For example, the following program reads each character from the screen and changes all uppercase letters to lowercase.

```
10 FOR X = &H400 TO &H5FF
20 A = PEEK(X)
30 IF A < 91 and A > 64 THEN POKE X,A + 32
40 NEXT X
```

Exercise care when using POKE; if you try to POKE into Basic's program storage or housekeeping area, you might lock up your computer. In contrast, if you specify locations in ROM, POKEing will have no effect.

For more on PEEKs and POKES, see "PEEK Performance" on p. 120.

Q: I have a Tandy DCM-5 modem and the Deluxe RS-232 Program Pak. Can I get a program that will let me upload and download programs from CompuServe or other BBSes and also allow me to save the information to disk or a printer?

I have two other questions. Does the Radio Shack DMP-200 printer have descenders that I can use with Scripsit? Is there a good screen-dump program for the DMP-200? (Elmer Zuehls, Mahomet, IL)

A: In my book, *Data Pack II* by Cer-Comp (5566 Ricochet Ave., Las Vegas, NV 89110) is the best Color Computer communications package. The

disk version sells for \$44.95; the tape version is \$34.95.

Data Pack II has a 55K upload/download buffer and a help menu and is compatible with PBJ's Word-Pak and parallel printer port. If you don't have Word-Pak, you can use *Data Pack II*'s high-resolution screen driver; however, using *Data Pack* reduces buffer size by 6K.

The *Data Pack II* does have shortcomings. It can't transmit the DEL \$7F character used as the delete/backspace character on most DEC computers. Furthermore, *Data Pack II* comes copy protected and won't support the Deluxe RS-232 Program Pak.

Descenders are the tails on lowercase letters like "y" and "g." A nine-pin dot-matrix printer like the DMP-200 adds only two dots for descenders. You don't need special control characters to invoke descenders.

Versadump ("Printer Answers," HOT CoCo, March 1985, p. 24) should work with the DMP-200, which is a direct descendant of the LP VIII.

Q: Can I use my disk drive and RS-232 Program Pak at the same time to up- and download programs?

Microprocessor Unlimited Inc.
24000 S. Peoria Ave.
Beggs, OK 74421
918-267-4961
64K by 4, \$4.75 each
64K by 1, \$1.10 each
No minimum order; shipping extra.

Leo Electronics
P.O. Box 11307
Torrance, CA 90510
800-421-9565
64K by 1, \$.80 each
\$10 minimum order; \$2 shipping.

IC Express
15358 Valley Blvd.
City of Industry, CA 91746
800-892-8889
64K by 1, \$.65 each
\$10 minimum order; \$5 shipping.

Table 1. Suppliers of 4164 chips.



“CANNED SOFTWARE FOR MY COCO?”

Choose Radio Shack's Profile® program— all you add is data.

You want quick-and-easy gourmet software, not “junk food.” That's why we offer powerful Profile database management (26-3274, \$49.95) for your disk-based Color Computer system.

A Profile database is easy to prepare. Mix all your files together, then quickly separate the ones you want. Keep track of names and addresses, inventory, collections, recipes—anything!

No muss, no fuss

With Profile, it's easy to set up a complete data-management system. You add your own ingredients to suit your taste, and you can design up to nine screen-display formats

for each file. You can include as many as 35 fields on each record.

You can store as many records as you have room for on your diskette. Or for extra-big helpings, add a second disk drive. Profile lets you cook up vast libraries of information.

To serve, just add a printer to create up to nine different reports for each file. You can print your stored information, as well as the results of Profile's automatic calculations.

Mix it all together

Profile lets you sort your records by defining up to nine different access methods, using as many as three different levels of sorting per method. Profile even lets you spoon in spreadsheet files from Dynacalc.

Come shop with us

Stop by your local Radio Shack and pick up Profile right off the

shelf. And while you're there, take a look at our complete stock of nourishing software. Or send for our new 1986 Software Reference and Computer Guide. We've got classic programs for every taste!

Radio Shack®
The Technology Store™

A DIVISION OF TANDY CORPORATION

New 1986 Computer Catalog.

Mail To: Radio Shack, Dept. 86-A-987B
300 One Tandy Center, Fort Worth, TX 76102

Name _____

Address _____

City _____

State _____ ZIP _____

Phone _____

Prices apply at Radio Shack Computer Centers and at participating stores and dealers. Profile/Registered TM Tandy Corporation. Dynacalc/TM Computer Systems of St. Louis. OS-9/TM Microware and Motorola, Inc. Profile contains no artificial additives.

Circle 75 on Reader Service card.

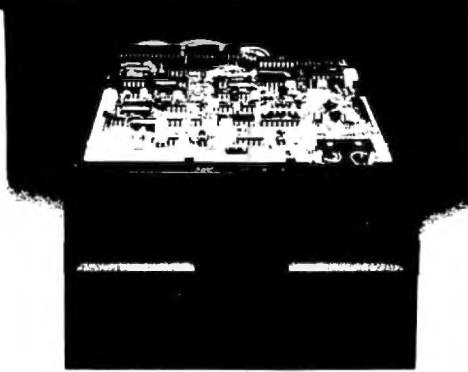
NEW DISK DRIVES

STARTING AT

\$ 89.⁹⁵

**WITH CASE &
POWER SUPPLY**

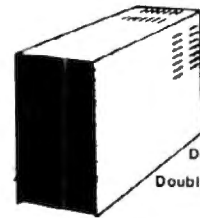
\$129.95



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 & CaseTeac..... \$129.95

Two Drives in Dual Case & Power SupplyTeac..... ~~\$279.95~~ CALL

1/2 ht double sided double density Disk Drives (Panasonic/Teac) ^{Tracks 40} \$ ~~\$118.95~~

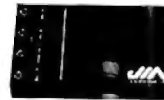
1/2 ht double sided double density Disk Drive with ps & case..... ^{Tracks 40} ~~\$199.95~~ CALL



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 ^{10 Diskettes} ~~\$17.95~~ CONTROL DATA

Unadvertised Specials \$Call

Drives cleaned, aligned & tested  \$29.95

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)

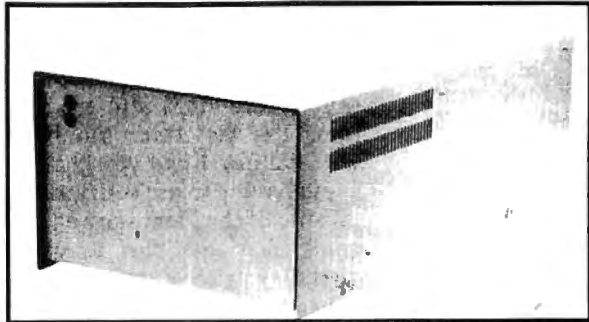
We welcome

- 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 \$39⁹⁵

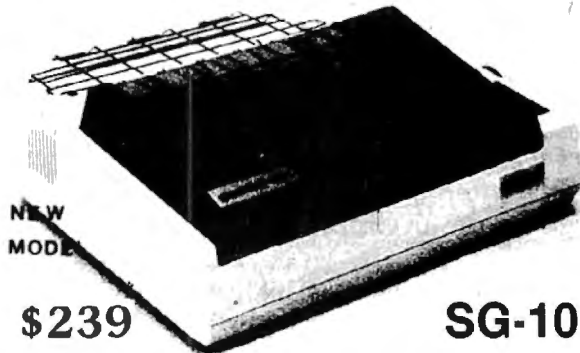
star PRINTERS

- 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



TRUE DATA PRODUCTS

9 S. Main
Uxbridge, MA 01569



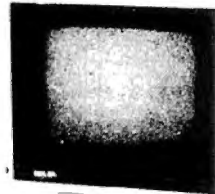
**CALL US TODAY!!
ORDER TOLL FREE**

**(617) 278-6555
1-800-635-0300**

NEW QUALITY VIDEO MONITORS

Starting at **\$79.⁹⁵**

**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 \$19⁹⁵

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:

~~\$59.95~~



COMPLETE SYSTEM

299⁹⁵

**NEW
LOW
PRICE**

now
with
screen
dump

Nothing more to buy!

Dealer inquiries invited

Color Monitor

by Scott Norman

Dynacalc, the powerful spreadsheet from Computer Systems Center, has joined a select group. A new version that runs under the OS-9 operating system has become one of the few third-party applications programs you can buy at Radio Shack Computer Centers. Dynacalc is a high-class product that gives Color Computer OS-9 devotees all the spreadsheet power anyone could ask of a 64K machine.

Unfortunately, to gain OS-9 compatibility, Computer Systems gave up some of the most attractive features of RSDOS Dynacalc. These include the high-density data display and built-in graphics. (See *HOT CoCo*, October 1984, p. 20, for my review.) The first deficiency can be remedied, and I've heard rumors of a fix for the second; nevertheless, the product represents a step back from the version that runs under the CoCo's built-in operating system.

OS-9 is supposed to be *the* operating system for future CoCos, however, and this version of Dynacalc fits right in. For example, the program stores data in sequential text files that are compatible with other OS-9 applications. This is in accord with OS-9's unified input/output (I/O) structure (the file structure is detailed in the Dynacalc manual). Also on the plus side, all of the truly fundamental features of previous Dynacalc versions—27 mathematical and statistical functions, nine logical functions, lots of cell formatting options—were retained in the OS-9 edition.

First of All

In keeping with Tandy's policy for new CoCo software, the unprotected Dynacalc disk includes a copy of OS-9. If you have Disk Extended Color Basic 1.1 or higher, just type in DOS and you'll be looking at the OS-9 prompt in about 18 seconds. Strangely enough, the generally excellent Dynacalc manual is a little vague on the startup drill, simply referring you to "your standard OS-9 boot procedure." That instruction might not be enough for newcomers to OS-9.

With Disk Extended Color Basic 1.0, you have to make additional preparations. Instead of using the DOS command, you must run a special loader routine to boot OS-9. The loader is a

short Basic program you type in from the Dynacalc manual and save on a separate disk. The routine appears to be the same as the one distributed with earlier versions of the operating system and presumably puts your 64K CoCo in the all-RAM mode and prepares it to read OS-9 disks.

A somewhat watered-down edition of OS-9 resides on the Dynacalc disk; the CMDS directory contains very few operating system commands. This might not bother the user who wants to work with the spreadsheet as it comes from the box, but it can lead to problems when you decide you're ready for more advanced topics, such as building a startup file, modifying the baud rate at which OS-9 communicates with your printer, or upgrading the display. I'll return to this.

Once the standard OS-9 prompt is on-screen, you summon the spreadsheet by typing in DYNACALC. The copyright notice comes up in 20 seconds or so, and pressing any key or waiting another 20 seconds brings up the blank spreadsheet. The display is similar to that of earlier editions: three message lines plus a portion of the spreadsheet itself.

The uppermost line gives current cell information, such as the cursor location and whether the cell contains a number, text, or a mathematical expression. The second line gives general information about the operating mode (automatic or only-on-demand recalculation, and whether the calculations proceed down rows or across columns first) and lets you know how much memory your sheet has used up. The final message line displays the contents of the current cell when you are entering or editing data; it also lists subcommand options when you initiate a Dynacalc command.

Operating Features

Like its predecessor, OS-9 Dynacalc allows up to 256 characters and 256 lines, but not on a single spreadsheet. If you delete the program's Help files, about 21K of working space will be available—enough, we are told, for approximately 1,750 cells of numerical data. (The exact capacity varies with the layout of the sheet; square sheets consume less memory than long, thin ones.) In contrast, the RSDOS version leaves

about 24.5K free when the Help files are retained and 33K when they are deleted. I try to keep the Help files intact. They greatly reduce the need to refer to the manual in setting up a sheet.

These memory consumption figures are typical of Level I OS-9, the version of the operating system that the CoCo uses. I've been told a more powerful Level II system would support about 36K worth of data.

The 32-character by 16-line CoCo display is a hindrance. You can see only 12 rows and three columns of data at the default column width of nine characters. Even Spectaculator displays one row more, and Tandy's first-generation spreadsheet certainly isn't in Dynacalc's class. Although Dynacalc has a windowing facility that lets you split the screen to look at two widely-separated portions of a spreadsheet, it can be very difficult to keep track of your data when you see such a small sample. In contrast, RSDOS Dynacalc's 51 by 24 display gives you a more reasonable 20 rows and five columns.

In its major operations, OS-9 Dynacalc is very similar to the RSDOS edition. The program emphasizes mathematical operations (such as trigonometric functions) and is light on predefined financial functions. The only built-in financial calculation is a Net Present Value command. That might not sit well with prospective business users. On the positive side, a powerful set of indexing and lookup functions lets you perform the sort of decision-making operations that would require nested If...Then loops in Basic.

The command syntax is the same as in the earlier program: You enter a command with the slash (/) character, followed by one or more letters or symbols depending on the number of subcommands needed to get the job done. For the most part, the commands are easy to remember.

Regrettably, there no longer seems to be a graceful way to abort most commands once you have entered a slash. For example, if you start to change a cell format and then have second thoughts (or worse, hit the wrong key), you have to go through with the change or reenter the old format. With the RSDOS program, you could usually get out of that sort of trouble by pressing the break key.

INTERCOMP SOUND Announces. . .

SYNTRAX: A MIDI sequencer for the Color Computer. Controls up to 16 polyphonic tracks of MIDI instruments (synthesizers, rhythm machines, etc.). SYNTRAX features include: interactive editor, 30,000+ note storage, transposition, clef and key signatures, chords, complex rhythms, tempo changes, independent repeats for each track, internal/external sync, all MIDI channel control data, and sequence chaining and merging.
Requires 64K, disk drive, **COLOR MIDI CONNECTION.**

COLOR MIDI CONNECTION: A MIDI hardware interface with 1 MIDI-in and 3 MIDI-out connectors. The interface plugs into the cartridge slot and comes with a 40-pin female connector (no Y-cable needed).

SYNTRAX \$75.00
COLOR MIDI CONNECTION \$98.00
Shipping & handling \$ 3.00
Send check or money order to:

INTERCOMP SOUND
129 Loyalist Avenue
Rochester, NY 14624

Circle 410 on Reader Service card.

AVAILABLE ON
TANDY 100

NEW

for the
TRS-80
color computer
64K

**HOME
INFORMATION
MANAGEMENT
SYSTEM**

INTEGRATED HOME DATA MANAGER WITH WINDOWS,
ON SCREEN CALCULATOR, and CALENDAR.
HOME CHECKBOOK maintains multiple accounts
for quick and easy analysis.
HOME ADDRESSBOOK up to 200 records of
mailing data with search and label options.
HOME INVENTORY provides valuable property
information recall and analysis.

AVAILABLE ON DISK (RM V....) **\$20.95**
CHECK/MONEY ORDER = \$2.00 SHIPPING.
NEW YORK RESIDENTS ADD SALES TAX.

VMC SOFTWARE
P.O. BOX 326
CAMBRIA HTS. N.Y. 11411



You can use a joystick or mouse to point the cursor quickly to any cell on the screen, but you must use either the cursor keys or the program's Go To command to move to more remote portions of a sheet. Unlike the RSDOS program, this Dynacalc does not have automatic key repeat; repairing that deficiency and the lack of lowercase text require a high-density display modification.

Dynacalc has a fairly wide range of display formats. You can write labels extending over several columns, specify left- or right-justification for both text and figures, and choose between integer, general floating-point, or dollars-and-cents representations of numbers.

There is also a simple bar graph mode, in which each cell in a range is rounded off to the nearest integer and replaced by a horizontal line consisting of the appropriate number of "plotting symbols"—graphics characters such as the asterisk. Dynacalc is flexible: You can specify a format for every cell in the current spreadsheet window with a single command or set up different formats for individual cells.

Unfortunately, the program has no format for defining an arbitrary number of decimal places. The general floating-point format's tendency to drop trailing zeros can produce a ragged-looking display and gives you more information than you need. On the other hand, the two decimal places of the dollars format are often insufficient.

You can cut down on your typing load when setting up formulas for calculating cell contents. You don't have to type in the addresses of data cells that you need for your formula; just move the cursor to a cell you want to specify and type the next symbol in the formula. The address will be properly recorded. This, and the ability to locate text-bearing cells according to their contents, are two of the program's more civilized features.

Fixing Things Up

Dynacalc can be a perfectly respectable addition to a library of OS-9 business software. Its performance is certainly good enough; all you have to do is get rid of that low-resolution display. The good news is that it's possible to upgrade the display; the bad news is that it's not an inexpensive proposition.

I never succeeded in getting the program to work with Frank Hogg Laboratory's O-Pak. I had hoped this would provide an inexpensive path to a 51 by 24 display, but the CoCo doesn't seem to have enough memory to accommodate both Dynacalc (even without the Help files) and the display utility. Unless I missed something fundamental in my attempts, my failure proves Frank

Hogg's own maxim about OS-9: "It can't be done in Level I."

The solution is to use the PBJ Word-Pak (or Word-Pak II) external display driver. This works beautifully. With Word-Pak, Dynacalc comes up in an 80 by 24 display—enough to give you 20 rows and eight columns of data. You get automatic repeat on all keys as a bonus. The modification supports lowercase text, and the joystick/mouse method of pointing to cells still works.

There is a catch: This approach can be expensive and somewhat complex. You must have Word-Pak and a good video monitor, along with a complete copy of OS-9. The abbreviated version on the Dynacalc disk doesn't contain all the command files needed to patch Word-Pak to the operating system: Backup, CHD, DELDIR, DSAVE, Load, MAKDIR, OS9GEN, Save, Unlink, and perhaps others whose operation is hidden from sight during the long process. (You wind up with a patched system disk onto which you finally copy the files CMDS/Dynacalc and Dynacalc.TRM from the Dynacalc disk.) It would be nice if OS-9 documentation were more explicit about such requirements.

Unfortunately, the combination of Word-Pak and OS-9 adds more than \$200 to the spreadsheet's cost. This can be a worthwhile investment if you absolutely must be able to view as much of a spreadsheet as possible, or if you intend to use other Word-Pak-compatible OS-9 software as the foundation of your computer system. I've got to be truthful, though: The RSDOS version of Dynacalc is a much better value. ■

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

Dynacalc for OS-9
Computer Systems Center
42 Four Seasons Center #122
Chesterfield, MO 63017
314-576-5020
Requires 64K of RAM and at least one disk drive.
\$99.95.

Word-Pak II
PBJ Inc.
P.O. Box 813
N. Bergen, NJ 07047
201-330-1898
\$134.95
OS-9 driver software, \$17.95

Announcing. . . .

MEGADISK PLUS +
**More Megabytes For
Less Megabucks!**

Next Page ----->

TOLL FREE ORDERING
1-800-343-8841

SOFTWARE SUPPORT, INC.
1 EDGELL ROAD, FRAMINGHAM, MA 01701
1-617-872-9090

**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

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 pro-
vide 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 264 on Reader Service card.

VIDIZDRAW— CLIPART—

Print Your Graphics On T-Shirts...Send large self-ad-
dress stamped envelope

MAX-X Pad a patch to run your RS-X Pad with
COCOMAX \$14.95 PPD.

MUSX DISKS 1-5, See our review April 85 RAIN-
BOW...Were \$13.95 each NOW \$6.00 EACH PPD.

SHRINX—reduce your graphics pictures Reviewed
March 85 RAINBOW
Special \$21.95 + \$1 Postage.

GRAPHICOM—Reg. \$29.95—NOW \$19.95 + \$2 Post-
age.

GRAPHICOM PICTURE DISKS (Art 1, Art 2, Aid 1, Font
1) Special \$19.95 \$2 Postage

CHRIS W. BROWN GRAPHICOM ART DISKS (New
Fonts & Graphics—2 Disk Set...\$19.95 + \$2 Post-
age.

COMPUSERVE Starter Kits—\$20 + 2 Postage.

64K CHIPS...Set of 8...\$19.95 + \$1 Post

BASF SSDD Disks with sleeves 10—\$10 PPD.

Send for our Digitized Pix Demo Disk \$3.50 PPD.

HAM SOFTWARE. **DISKS & MORE**

VIDX-VIDEO DIGITIZER

Connects to the RS-232 port of your COCO, no need for Y-CABLES
or MULTIPACKS! Runs on minimum 16K to 32K TAPE or DISK.
Comes with software easily modifiable to your needs. WHY PAY
MORE? Unlimited GREY scale when you use a color camera! The
only digitizer that recommends you use a color camera!

VIDX-1 \$99.95 + \$3 Postage
VIDX-2 \$124.95 + \$3 Postage

VIDX-2 Has A RS-232 Switcher Built In

✓ CHECK US FOR OUR LOW
PRICES!! SEND FOR OUR CATALOG

To Order Send Check or M. O.



HOT CoCo

Should I use a Y cable? (Mark Lawrence,
Brooklyn, NY)

A: Unfortunately, the RS-232 Pro-
gram Pak uses software in ROM
that conflicts with addresses used by
Disk Extended Color Basic. A Y cable
won't help you, unless you remove the
soldered ROM. However, you can use
them together if you have appropriate
software and the Multi-Pak Interface:
When you use the Multi-Pak Interface to
select the disk controller slot, the ACIA
(hardware portion of the RS-232 Pak) is
used and its ROM is bypassed. OS-9 ver-
sion 01.01.00 has a built-in driver for your
program pack. A number of commercial
terminal programs for OS-9 (as well as
the public-domain Mickey Term avail-
able on many BBSes) support this driver.

Q: My CoCo sometimes loses color.
Q: When I talk to my local dealer, he
says it's the monitor. I've tried other
monitors and it still happens. (Chris Eg-
ger, Broken Arrow, OK)

A: If you have a hardware problem,
lack standard testing equipment,
and want to solve the problem yourself,
try swapping parts from an identical ma-
chine to isolate the bad part. Change the
6847 VDG (video display generator) first.
Be aware, however, that swapping parts
can blow a chip on the good computer.
Of course, the safest method is to use a
schematic and proper equipment, such
as an oscilloscope and voltage/ohm me-
ter, to isolate the problem.

Q: How can I stop the head from
banging on drive zero and drive
1? Can I use CBasic to add symbols to a
schematic program I've written in Ba-

sic? If I upgrade to 256K ("Fat CoCo,"
HOT CoCo, September 1985, p. 28), will
programs like VIP software still run?
(Byron E. Sauve, Golden, CO)

A: ADOS fixes head banging. If you
have Disk Extended Color Basic
1.0 but don't have ADOS, type in EXEC
&HD66C when you turn on the power.
This restores the head to track 1, where
ROM expects to find it.

Consult "Seeing What CBasic Is Made
Of" (HOT CoCo, February 1986, p. 23) for
a list of CBasic's features. If CBasic is com-
patible with your program, you'll signifi-
cantly improve its execution speed.

J&R Electronics (P.O. Box 2572, Co-
lumbia, MD 21045, 301-987-9067 or
301-788-0861) supports most popular
software with its RAM disk, which works
with their Banker 256K and 512K mem-
ory upgrades. You'd need to make major
changes to run VIP's integrated library,
but if you bought the nonintegrated ver-
sion, they are compatible. If you have
Elite-Word, Elite-Calc, or Elite-File, you
can run them using the patches in the
Figure. Table 2 lists other patches and
software supplied free with Banker. ■

```

16 CLEAR 200, &H6F00
17 LOADM "BANKRDSK":EXEC
18 GOTO 100

17: loadm"bankrdsk":exec

81 CLEAR 200, &H6F00
82 LOADM "BANKRDSK":EXEC
83 GOTO 170
    
```

Figure. Patches to drivers for Elite-
Word, Elite-Calc, and Elite-File
(respectively).

Patch	Description
OS9BOOTFIX	Patches OS-9 so that it's compatible with Banker.
CLEARFIX	Fixes most software that uses CLR in the synchronous ad- dress multiplexer (SAM) range of addresses.
BANKRDSK	35- or 40-track RAM disk.
S.XXX	Telewriter-64 patch for an embedded RAM disk.
PCOPY134	Patches Extended Color Basic to allow 134 pages of graphics.
PCOPYDEMO	A graphics demo that uses PCOPY134.
BANKRSPL	A machine-language spooler with a 200K printer buffer.
BANKTEST	Tests the entire 256K of memory.
B256	Copies ROM to RAM in the four 32K upper banks.
BANKRBAK	A single swap, multiple copy utility for backing up disks.
BANKRPAG	A Basic program that views any area of memory (256K) in any PMode.
RAMDSKUT	A utility that lets you change drive number or the number of tracks and load from any drive.
PAGE8X32	Provides eight pages of 32K. Allows program to switch back and forth between pages.

Table 2. Patches and software supplied free with Banker.

Prices Change
Every Day.
Please Call
1-800-343-8841
For Lower Prices.



Prices Change
Every Day.
Please Call
1-800-343-8841
For Lower Prices.

DEALER INQUIRIES INVITED

Super Sale on New Hard Drives 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

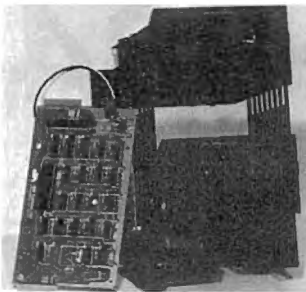


Fixed and Removeable PLUS + SYSTEM

Drive a 5 to 50 Megabyte Hard Bargain Starting at \$449.95
Removeable Cartridge Systems Now Available!!!

MEGAPLEX your Megadisk — 2 to 10 Port Systems
Prices Start at a LOW \$399.95
Models I / II/ IV 4P and MAX 80 Computers

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 \$69.95

CANADIAN CUSTOMERS PLEASE CALL 514-383-5293

TERMS and CONDITIONS:
All prices are cash discounted. However, we do
accept MC, VISA, AMEX & DISCOVER credit cards.
Please inquire.
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 at no added cost.
Not responsible for typographical errors.

SOFTWARE SUPPORT, INC
1 Edgell Road
Framingham, MA 01701
1-617-872-9090
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-
a-round is accomplished. It is necessary to have a
R/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

Prices Change
Every Day.
Please Call
1-800-343-8841
For Lower Prices.

PRICE 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

5 Megabytes Internal Mount IBM/PC	starting at \$ 239.95	
10 Megabytes Internal Mount IBM/Tandy 1000	starting at 389.95	
20 Megabytes Internal Mount IBM/Tandy 1000	starting at 489.95	Call
5 Megabytes External System	starting at 499.95	for new
10 Megabytes External System	starting at 749.95	low
20 Megabytes External System	starting at 899.95	prices
Tape Backup System — Internal Or External (IBM/PC)	starting at 449.95	

WOW! NEW LOW PRICES
CALL for unadvertised specials

DOS Systems Available: { IBM/Heath — DOS, 1.0, 2.0, 2.1, 3.0, or later
TRS/80-LDOS, TRSDOS 6.x, Newdos/80, Dosplus, CP/M, COCO DOS, Max/80 LDOS, OS9

FULLY WARRANTIED — 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-a-round on all disk drives and power supplies.

Full Height — Tandon	
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 — Tandon/TEAC	
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	109.05
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 |

Commodore Disk Drives
 236.95 |

Power Supplies and Cabinets 5/4" and Hard Drive Systems
 starting at 42.00 |

COLOR COMPUTER DISK DRIVE SYSTEMS AND ADD IN PRODUCTS

40 Track Single Head Drive with Case, Power Supply, Cable Controller, Instruction Booklet, Diskettes	Special \$ 229.95 call 289.95
40 Track Dual Head with Case, Power Supply, Cable, Controller, Instruction Booklet, Diskettes	259.95
Above with Dual Drives in One Cabinet	379.95
Dual DOS Switch	29.95
With Second DOS System — JDOS, RSDOS, and Booklet	69.95

CALL FOR MODEM SPECIALS

ALL IN-STOCK ITEMS SHIPPED WITHIN 24 HOURS. SAME DAY SHIPPING
PROVIDED BY REQUEST WITHOUT ANY EXTRA HANDLING CHARGES.

TURBO-M™ PC

IBM-PC/XT WORKALIKE

All of our computers have: 8 slot motherboard, 640K monochrome adapter, parallel printer port, 130 watt power supply, free software, monitor, serial port, clock calendar—all with our full warranty.

/PC-2—Floppy Drives—Monochrome Monitor, DOS	\$1,199.95
10 meg—1 Floppy Drive—Monochrome Monitor, DOS	1,499.00
20 meg—1 Floppy Drive—Monochrome Monitor, DOS	1,649.00
Internal Tape Backup For Any Of Above Systems Add	\$449.95

PRINTERS

Dot Matrix	
Citizen	\$ Call
Star Micronics — S.G. Series	starting at \$259.95
Panasonic 1090	249.95
Daisy Wheel	
Silver Reed 440 80 Column 12 CPS	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
Apple/Franklin Printer Interface w/Graphics and Cable	84.95
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
Twoprint 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

80

© 1985 SOFTWARE SUPPORT, INC.

1 Edgell Road, Framingham, MA 01701 (617) 872-9090 Telex-383425

Hours: Mon. thru Fri. 9:30 am to 5:30 pm (E.S.T.) Sat. 10 am to 3:30 pm

SERVICE POLICY — Our Professional Technical Staff Is Available To Assist You Monday Through Saturday.
WARRANTIES — Up To One Full Year Parts And Labor. Floppy Disk Drive Power Supplies — Five (5) Years.

SERVICE — 24 Hour Turn-A-Round On All In-Stock Parts. Dealer Inquiries Invited. Call 617-872-9090

Please Call For Shipping,
Handling And Insurance.
Cash Discount Prices

Toll Free 1-800-343-8841

Please Call For Our Latest Price Saving Specials.

Not Responsible for Typographical Errors.
Prices and Specifications May Change
Without Notice.

Buffer Up

Mac Master from Computer Friends is a universal buffer and printer controller. As a buffer, Mac Master frees the computer while its memory content is printed, saved to the buffer, or sent to any other peripheral. Mac Master has a multiple copy function and provides on-line numbering of the copy being printed.

As a printer controller, Mac Master can store up to 99 control strings that you can recall from its front-panel keyboard. The strings can contain printer fonts, forms, line spacing, form phrases, or graphics characters like company logos. You can change the control string without leaving the program you're using.

Mac Master is available in serial and parallel versions. It comes with 64K (\$299), 256K (\$450), or 1 megabyte (\$750) of memory. For more information, contact Computer Friends, 6415 SW Canyon Court, Portland, OR 97221, 800-547-3303.

Circle 568 on Reader Service card.

Fast Fingers

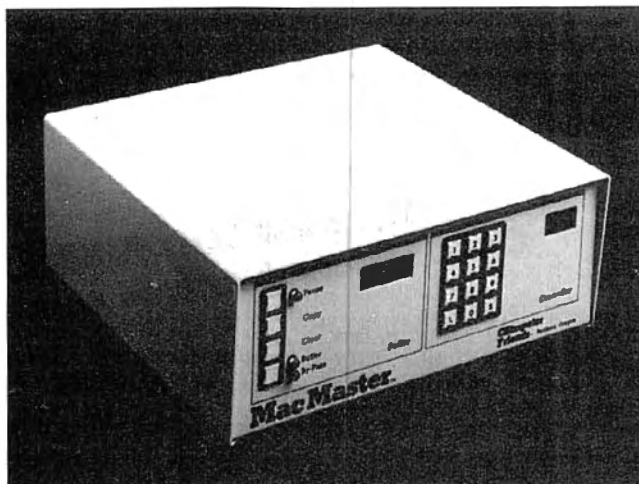
Fastype from Press A Software is now available for the Models III, 4, and 1000, and for the Network III and 4. It teaches beginners touch typing and builds advanced typists' speed and accuracy. The program includes drills on frequently used words, computer nomenclature, Basic statements, and DOS commands. The add/change mode allows you to create custom lessons.

The single-system version costs \$39.95; the Network version \$199.95. Add \$1.50 for postage and handling. For more information, contact Press A Software, Box 364, Jerome, AZ 86331, 602-634-2688.

Circle 567 on Reader Service card.

Laser Fare

Prosoft has announced four Model I/III/4 products that support the Hewlett-Packard



Mac Master is a printer buffer and controller.

LaserJet and LaserJet Plus printers. These products and services let you create near-typeset-quality printing in-house.

The first product is an add-on to Prosoft's Allwrite word processor. It adds support for the LaserJet's built-in fonts, and for font cartridges A, B, and D. You can intermix fonts on each page of a document or within multiple columns, titles, and footnotes.

The other three products support the LaserJet Plus. They are a Soft-font conversion service (MS-DOS to TRS-80), a utility program that downloads the soft fonts and also gives easier control over the LaserJet Plus, and a second Allwrite add-on that lets you use the soft fonts and improves the spacing features of the LaserJet Plus.

Each product costs between \$50 and \$100. For further information, contact Prosoft, Box 560, N. Hollywood, CA 91603, 818-764-3131.

Circle 551 on Reader Service card.

Investment Matters

Programmed Press announces version 1.3 of Investment and Statistical Software, a package of 50 ready-to-run programs for statistical forecasting and evaluation of investments.

The first section's 20 programs introduce statistical methods and illustrate the use of a computer to solve sta-

tistical problems. The remaining 30 programs evaluate price, return, and risk for stocks, bonds, options, futures, and foreign exchange investments. They also give strategies for using these investments.

The package is available for any computer with 5¼-inch disk drives, including TRS-80s and MS-DOS computers. It requires one disk drive and 64K of RAM. The price is \$100 for the software and \$19.95 for a 220-page handbook that lists all 50 programs in Basic and provides sample run illustrations. For more details, contact Programmed Press, 2301 Baylis Ave., Elmont, NY 11003, 516-775-0933.

Circle 553 on Reader Service card.

Pay Day

Joe Lynn's Payroll System (\$49.95 plus \$3 for shipping) is now available for the Model 4/4P/4D under TRSDOS 6.2. Versions are also available for the Model III and IBM PC compatibles. The program prints paychecks, posts the totals, and prints a journal record, W2s, or the data for a 941 form.

Initial setup takes less than five minutes per employee. Although designed for small businesses with 10-25 employees, the system can handle up to 999 employees. Tax rates are built in to prevent errors in data entry. Paystubs

provide year-to-date totals for all deductions as well as year-to-date net totals.

Minimum requirements are TRSDOS 6.2, 64K of RAM, and two disk drives. For more information, contact Joe Lynn, 23501 W. Gagne Lane, Plainfield, IL 60544, 800-243-8563.

Circle 560 on Reader Service card.

Mi Diario

Daily Reminder, International Computer Products' desktop calendar program, is now available in four languages: English, Spanish, German, and French. The program runs on the Models I, III, and 4, and on the IBM PC. It requires 32K of RAM and one disk drive. A printer is optional.

You may enter up to 16 separate memos for each day of the year. The program registers birthdays, holidays, and other annual events permanently. A monthly calendar highlights important days and lets you review appointments for any day. You can get full-page daily printouts with space for additional notes.

The price is \$39.95. Add \$2 for shipping and handling. For more information, contact International Computer Products, 346 Western Ave., Los Angeles, CA 90004, 213-462-8381.

Circle 566 on Reader Service card.

Freedom Of Disassembly

The Alternate Source's Insight is a standalone, advanced disassembler for the Model 4. It features full label generation with controlled data and code separation, data area decomposition, multiple output disk files, formatted printer output, and user-selectable video output control.

The Insight disassembler is relocatable and its output source code is compatible with most available TRS-80 editor/assemblers. The program is interactive with

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.

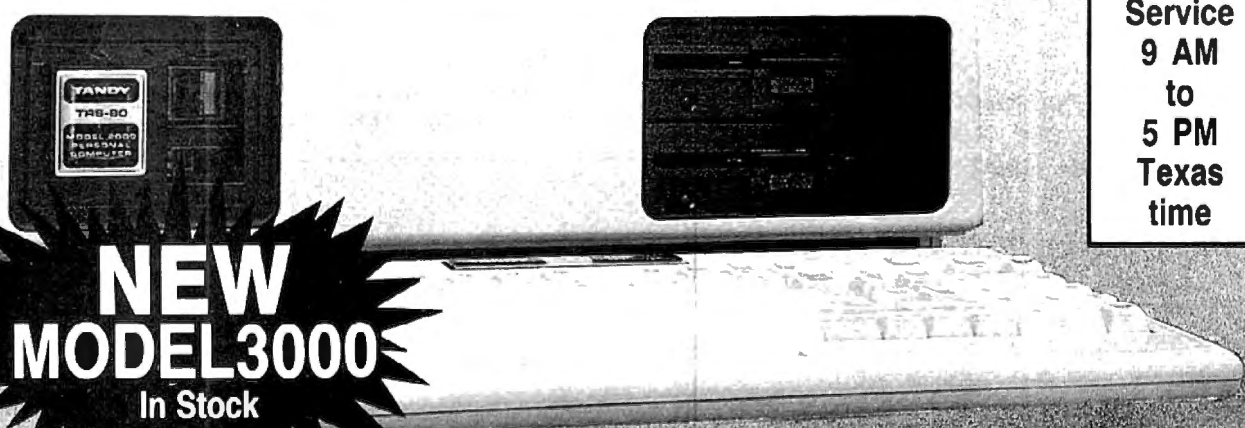
Same day processing for speedy delivery

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)

Circle 250 on Reader Service card.

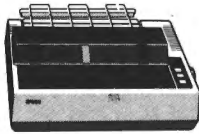
MARYMAC INDUSTRIES INC.

800-231-3680

Radio Shack® Tandy®

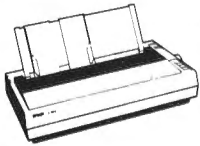
EPSON PRINTERS

People you Trust to give you the very best!



• Lowest Discount Prices

• Reliable Service



• Quality Products

"Worlds Largest Independent Authorized Computer Dealer"

22511 Katy Fwy., Katy (Houston) Texas 77450
(713) 392-0747 Telex 774132

Circle 227 on Reader Service card.

CP/M-68K TANDY-6000 MacIntosh

You purchased a computer with an MC68000 16/32-bit processor, one of the most powerful available. Now you need the software to make it run!

You need a powerful operating system like CP/M-68K. You need full-featured compilers for FORTRAN-77, PASCAL, C, and BASIC. And you need the compatibility to run the many CP/M-2.2 programs you are familiar with.

You need

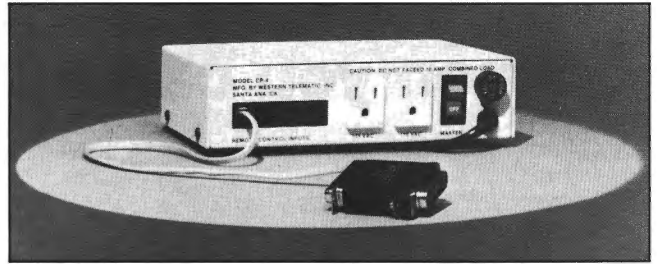
TriSoft

4102 Avenue G
Austin, Texas 78751

1-800-531-5170
(512) 472-0744



NEW PRODUCTS



Call-Power is a modem-actuated power switch from Western Telematic.

TRSDOS 6's Debug utility. All DOS library commands are available from within the program.

The program costs \$19.95 plus \$3 for shipping and handling. For further information, contact The Alternate Source, 704 N. Pennsylvania Ave., Lansing, MI 48906, 517-482-8270.

Circle 561 on Reader Service card.

Switch-hitting

Call-Power, a power switch that allows remote access to your computer when it's turned off, is available from Western Telematic. When your modem answers a call, the switch turns the computer on; when the modem hangs up, the computer is turned off.

The switch supports up to four modems and has built-in surge protection and a circuit breaker. It switches up to 10 amps of ac power and offers a bypass switch for local control. The price is \$295. For more information, contact Western Telematic Inc., 2435

S. Anne St., Santa Ana, CA 92704, 800-854-7226.

Circle 554 on Reader Service card.

Get Organized

The MediaPack4 from Amaray International stores and protects up to 40 5¼-inch disks. It contains four modular filing units in red, blue, green, and yellow. Additional units interlock to form a one-piece filing system.

Amaray International's MediaPack4 filing system costs \$16.95. For more information, contact Amaray International Corp., 14935 NE 95th St., Redmond, WA 98052-2508, 206-881-1000.

Circle 555 on Reader Service card.

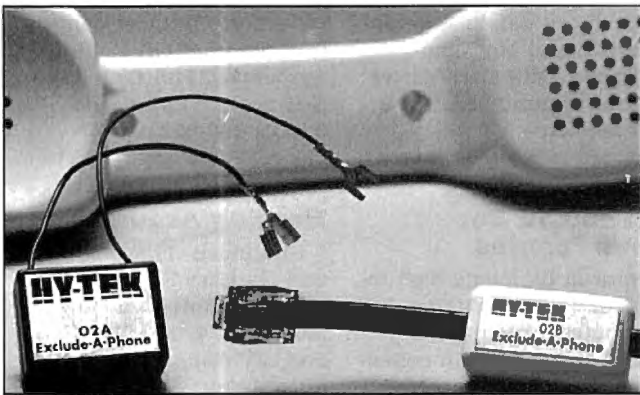
CoCo Adventure

Computerware offers Escape: 2012 for cassette (\$24.95) or disk-based (\$27.95) 64K Color Computers. The scenario is an intergalactic standoff between warring solar systems in the year 2012. As a prisoner of war, you must escape from behind enemy lines back to



MediaPack4 organizes, stores, and protects your disks.

NEW PRODUCTS



Exclude-A-Phone protects your phone line.

the United Earth Forces.

You fight obstacles as you move through a three-dimensional maze of 138 rooms in more than 35 screens. You also need to master two arcade-style sequences before you can proceed. For more information, contact Computeware, Box 668, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, 619-436-3512.

Circle 564 on Reader Service card.

Do Not Disturb

Hy-Tek's Exclude-A-Phone (\$23.95) isolates your modem to prevent an extension phone from interfering with computer transmissions. Exclude-A-Phone is easily installed and operates off the phone's power supply.

Hy-Tek also manufactures Tap Detector (\$59.95), a device that warns you via an alarm and warning light when someone intrudes on your line.

For more information, contact R.K. Burtchael Co., 516

SE Morrison, Suite 201, Portland, OR 97214, 800-342-5752.

Circle 558 on Reader Service card.

The Shining

The Ryte Light (\$34.95) mounts on your typewriter or printer and illuminates an entire page down to the line being printed. Special mounting clips attach the low-watt, fluorescent light to any machine.

The Ryte Light comes with a compact power supply. For more information, contact Conmac Service Co., P.O. Box 270, Lyons, NJ 07939, 201-221-9265.

Circle 559 on Reader Service card.

Hot Sketch

T.Soft's HIDRAW, a computer-assisted-drawing program for the Model 4, now runs on Micro Labs' high-resolution graphics board. It also supports the Radio Shack hires board. HIDRAW offers features like automatic centering and allows one-handed



Brighten up your printouts with the Ryte Light.

Circle 86 on Reader Service card.

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

Compulogic

4831 SOUTH HAMPTON RD. LB41
DALLAS TEXAS 75232
214/330-1322

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 181 on Reader Service card.

EXPAND THE TANDY 2000® TO

896K

OF DOS ADDRESSABLE RAM

Includes RAMdisk Software at No Extra Cost ... Add 640K of External RAM Memory to TANDY 2000's* 256K of Internal RAM Memory for a total of 896K of DOS Addressable RAM.

★★ New Products Available Soon ★★
(Send for catalog)

cost:

\$495.00 for a 640K bytes of External RAM Memory Board (Includes RAMdisk Software)

Call about our Trade-in Exchange option if you already use Tandy's 128K External Memory Board.

for ordering (509) 627-5291
and information call: Hours 9:00-5:00 PST

terms:

We accept Check, MO, Visa, Mastercard
Add 7.3% sales tax in Wash.
Add \$3-shipping/handling, \$5 foreign.

TANDY 2000® IS A TRADEMARK OF TANDY CORPORATION
RAMdisk is a Random-Access-Memory based disk

ENVISION DESIGNS

1909 ORCHARD WAY • RICHLAND, WASHINGTON 99352

operation using the keypad for commands.

The program costs \$49.95. For more information, contact T.Soft, R.D. #5, Box 120, Kittanning, PA 16201, 412-548-5561.

Circle 552 on Reader Service card.

Soft Spread

Solving Business Problems: All About Spreadsheet Software (\$16.95) from Hayden Book Co. explores spreadsheet features and applications. It helps you select the program within your price range that best suits your requirements.

The book explains the fundamentals of spreadsheets and the types of programs currently available. It takes an in-depth look at two products, Multiplan and Lotus 1-2-3, and then explores competing programs, such as Symphony and Framework. A dozen tables, comparing everything from price to compatibility, and a question-

naire for evaluating any spreadsheet are also included. For more information, contact Hayden Book Co., 10 Mulholland Drive, Hasbrouck Heights, NJ 07604, 201-393-6306.

Circle 562 on Reader Service card.

Retirement Plan

Annuity (\$20) from Recreational Mathematical Software is a financial planning program that runs on Models III, 4/4P, and IBM PC compatibles, including the Tandy models.

The program helps you predict annuity income at any point in the future. You can specify savings amounts for any number of periods per year and use two interest rates for range planning. With Annuity, you have the options of varying the payment amount and looking at periods with no payments. In addition, the program sends answers to the screen, the printer, or both.

For more details, contact Recreational Mathematical Software, 129 Carol Drive, Clarks Summit, PA 18411, 717-586-2784.

Circle 569 on Reader Service card.

A Thought For Your Pennies

Horizon III, a data base inventory system from GS Computer Systems, lets you keep records of coin collections. It includes integrated accounting, word processing, telecommunications, and desktop utilities software. The package is available for the Models I, II, III, and 4 (\$25) and for IBM compatibles, including the Tandy models (\$49.95).

Horizon III manipulates data into a variety of reports. It keeps track of coins sold or stolen and reports income or loss on each transaction.

The program comes with an integrated list of values for most coins and automatically adjusts values on coins in a

collection. For more information, contact GS Computer Systems, 1765 Gulf Blvd., Suite D, Englewood, FL 33533, 800-622-4070.

Circle 556 on Reader Service card.

Horsing Around

Enhanced Thoroughbred and Harness Racing Handicapping Software for the Models III, 4, 100/200, CoCo, and IBM compatibles is available from Software Exchange. It's an improved version of an earlier handicapping package.

The package contains the programs Thoroughbred Racing Analysis 2, Harness Racing Analysis 2, and Bet Return Analysis. It comes on disk or cassette and includes complete instructions. The price is \$49.95 plus \$2 for shipping and handling. Contact Software Exchange, 2681 Peterboro Road, P.O. Box 5382, W. Bloomfield, MI 48033, 313-626-7208.

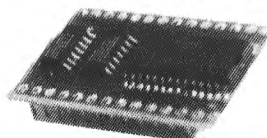
Circle 557 on Reader Service card.

Circle 534 on Reader Service card.



Mail-Order Electronics • Worldwide • Since 1974

TRS-80 MODEL 100



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) . . . \$29.95 ea. or 3/\$79.95

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) \$99.95 ea. or 2/\$189.95

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 (4164) and documentation for conversion) \$19.95

PROMETHEUS MODEMS



Intelligent 1200/300 Baud Modem with Real Time Clock/Calendar

The ProModem™ is a Bell 212A (1200/300) intelligent stand-alone modem with RS-232C interface for host computer connection. Hayes command set compatible plus an additional extended command set. Shown with alphanumeric display option.

PM1200 RS-232 Stand-Alone Unit \$299.95

OPTIONS FOR PROMODEM 1200

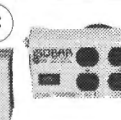
PM-OP512K (Communication Buffer Option) \$129.95

BUF512K (512K Memory for PM-OP512K) \$ 54.95

PM-ALP (Alphanumeric Display) \$ 79.95

PM-Special#2 (Incl. PM-OP512K, BUF512K & PM-ALP) \$249.95

Isobar Surge Suppressors



Part No.	Description	Price
IBAR-2-6	2 Outlet, 6-foot Cord	\$44.95
IBAR-4-6	4 Outlet, 6-foot Cord	\$59.95
IBAR-8-15	8 Outlet, 15-foot Cord	\$74.95

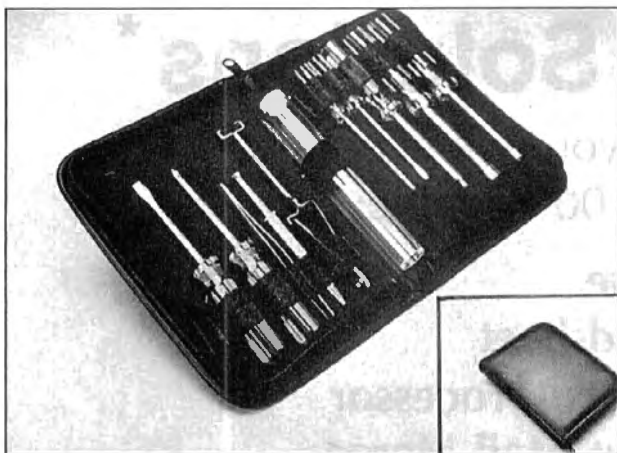
\$20.00 Minimum Order - U.S. Funds Only
California Residents Add 6% or 6 1/2% Sales Tax
Shipping - Add 5% plus \$1.50 Insurance
Send S.A.S.E. for Quarterly Sales Flyer!

Spec Sheets - 30¢ each
Send \$1.00 Postage for your
FREE 1986 JAMECO CATALOG
Prices Subject to Change



1355 SHOREWAY ROAD, BELMONT, CA 94002
5/86 Phone Orders Welcome (415) 592-8097 Telex: 176043

DIFFERENT TRACK



PC Tool Kit to the rescue.

Micro Surgery

MicroComputer Accessories' PC Tool Kit (model #420) lets you play doctor on your computer. A selection of 11 instruments, including screwdrivers and tweezers, is packaged in a black vinyl zippered case. The PC Tool Kit costs \$29.95. Contact MicroComputer Accessories Inc., 5721 Buckingham Parkway, Culver City, CA 90231, 213-641-1800. Circle 563 on Reader Service card.

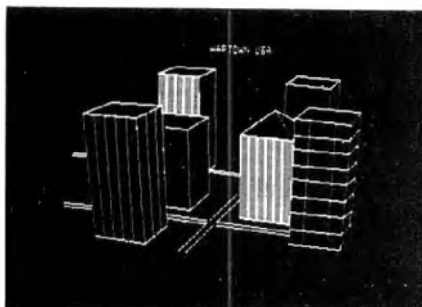
Circle 464 on Reader Service card.

New Products Index

Reader Service Number	Company	Page
561	Alternate Source, The	152
555	Amaray International Corp.	154
568	Computer Friends	152
564	Computerware	154
559	Conmac Service Co.	155
556	GS Computer Systems	156
562	Hayden Book Co.	156
566	International Computer Products	152
560	Joc Lynn	152
563	MicroComputer Accessories Inc.	157
567	Press A Software	152
553	Programmed Press	152
551	Prosoft	152
558	R.K. Burtchael Co.	155
569	Recreational Mathematical Software	156
557	Software Exchange	156
552	T.Soft	155
554	Western Telematic Inc.	154

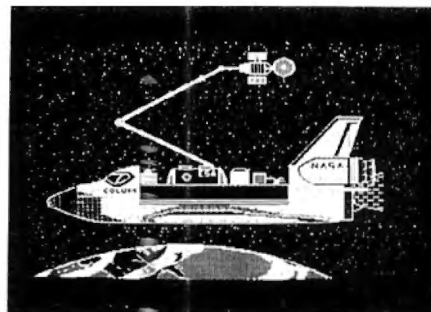
New Products listings are based on information supplied in manufacturers' press releases. 80 Micro has not tested or reviewed these products and cannot guarantee any claims.

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 5½% tax.

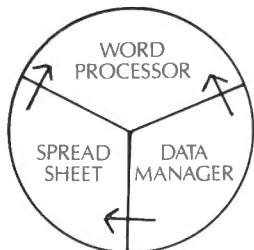
MICRO-LABS, INC. 214-235-0915
902 Pinecrest, Richardson, Texas 75080

A Truly
Integrated Software

NEW! MODEL 100 3-in-1 ROM

Interactive Solutions*

All the software that you will ever need
on the Model 100 Portable:



- 1— Data Base
- 2— Spreadsheet
- 3— Word Processor
with Mail Merge

Now on a plug-in ROM. *Integrated* and easy as 1-2-3!

Interactive Solutions

Tandy Cat. #26-3844

Available at your nearest

Radio Shack®
COMPUTER CENTERS

■ **The Data Base** turns your Mod 100 into a personal filing system. You can store, examine, update select, sort and list a wide variety of information - from personnel records and inventory facts to appointment schedules and client lists.

■ **The Spreadsheet** turns your Mod 100 into a powerful decision tool. It is a full featured spreadsheet with 99x99 cells and provides fast decimal arithmetic in formula computation with complete range of scientific functions.

■ **The Word Processor** uses the Text editor of Mod 100 and gives you additional features for formatting and printing. You can set margins, line/para spacing, justify, define header/footer and use special print features like underline, **boldface**, etc.

MORE MEMORY Interactive Solutions does not occupy RAM memory, so frees your precious RAM for larger data files.

EXTRA CONVENIENCE Interactive Solutions plugs in the optional ROM socket. It is always resident and ready to work. You don't need to load programs from cassette recorder any more.

Interactive Solutions integrates all of your data information in Mod 100. With a touch of a function key, you can easily:

- Select and move items from **Data Base** files into **Spreadsheet** columns.
- Generate a report in **Data Base** program and move to the **Word Processor**.
- Cut any part of **Spreadsheet** and move to the **Word Processor**.
- Merge the items (like names, addresses) from **Data Base** files into a **Form Letter** and generate multiple letters or labels.

*All this and much more in
a 32K bytes ROM from*

DCM Data Products
1710, Two Tandy Center
Fort Worth, Tx. 76102
Tel: 817/390-2762



*Copyright DCM Data Products, Licensed to Tandy Corporation.

® Registered trademark of Tandy Corporation.

Radio Shack and Model 100 are trademarks of Tandy Corporation.
1-2-3 is a trademark of Lotus Corporation.

THE CLASSIFIED

80micro

NEWSLETTERS

NORTHERN BYTES newsletter: Specific information for Models I/III/4(D/P). Sample \$2.00. TASIO, 704 North Pennsylvania, Lansing, Michigan 48906. 1-800-253-3200 ext. 700

HORSE RACING

\$\$\$WIN with Thoroughbred, Harness, Greyhound Handicapping Software. . . \$29.95, enhanced. . . \$49.95. Free information. Software Exchange, PO Box 5382M, W. Bloomfield, MI 48033. (313) 626-7208.

SCHOOL ADMINISTRATORS

SCHOOL ATTENDANCE/LIBRARY MANAGEMENT Recordkeeping software for Models III/4/1000. Call Ms. Hanlon, K-12 MicroMedia Publishing, 800-922-0401 for information on these affordable, effective tools. Preview/Demo available.

EDUCATION INSTRUCTION

Joe Lynn Computer Services Video instruction tapes on lazy writer TRSDOS Scripsit BASIC \$19.95. VHS or Beta. 1-800-243-8563.

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.

SERVICES

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 III+/4+ Users! PROAID III+/4+ provides full page reports and more. \$65. Clay Watts Software, 68C North Loop, Cedar Hill, TX 75104. 214-291-1171.

If you need a 'Meat and Potatoes' Data Base System for your Model I, III, 4 or 4P use PROFILE 3.4. Then add the 'Gravy'! NO-LIMITS from THE YANKEE CO. POX 613 POCONO PINES, PA 18350

16B, 6000 (XENIX) USERS: Business programs and COBOL programmer aids. Demonstration system (mailing list) \$19.95. Culleton Group, Inc. Box 1224, Sykeville, MD 21784.

SCRAMBLE DANGLE. Educational vocabulary game. Model III/IV. \$9.95 plus \$1.50 postage. George Goodwin, 1301 Olive, Baytown, TX 77520.

POPULAR WORD SEARCH PUZZLE GENERATOR. Create infinite number \$12.95 MyLoan Program. Calculate payments and amortize loans. \$10.95. III/IV J&J HomeSoft, Box 272, Beech Grove, IN 46107.

Joe Lynn's Payroll System for TRS-80 III/4 and all IBM compatibles. \$149.95 1-800-243-8563.

MASK MAKER—TRS-80 Model 4/4P programmers. Never write code for screen displays again! Type directly to video. Outputs Basic, Assembly source, or Himem Module. 20K /CMD program. \$49.95. VISA, M/C. Strachan Holdings Ltd. RR #8, Site #10, Comp. #13, Prince George, B.C., Canada V2N 4M6 (604) 963-7927.

HARDWARE

MODEMS, PRINTERS, TERMINALS. Distributor pricing to end users and dealers—FREE SHIPPING CALL 1-800-833-2600 for catalog

MEGABYTE BOARD FOR THE TANDY 1000, 1200. Multifunction board includes 1 meg RAM, DMA controller, clock/calendar, serial expansion port, software for up to 768K; rebootable RAM-disk for \$555. Halfmeg \$395. New—Expansion chassis for Tandy 1000. Matthew Electronics, Inc., 386 Avenida Vereda, Ojai, CA 93023 805-646-7790.

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.

Get the attention you deserve. For only \$5 per word, your ad will be seen by over 100,000 dedicated TRS-80/Tandy users. Ads must be received by the 20th of the month 3 months prior to publication date. **Send yours today.**

Please Print Carefully. We'll Do Our Best, But We Can't Be Responsible For Illegible Writing.

Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____

CATEGORY _____

_____ (3 words)

_____ (6)

_____ (9)

_____ (12)

_____ (15)

_____ (18)

_____ (21)

_____ (24)

_____ (27)

Number of Words _____

Total x \$5/issue = _____

For _____ issue

Make Checks Payable to 80 Micro

NO AD ACCEPTED WITHOUT PAYMENT

80 Pine St., Peterborough, NH 03458

Micro Biology

February's Life contest produced a bevy of Basic beauties, from which *80 Micro's* technical editors selected two winners. Entries were judged on speed, ease of cell entry, and display readability, which add up to the most important criterion: Did we have fun experimenting with your program?

Our apologies for misstating the rules of Life. A cell survives only when it has two or three neighbors, not four. Most entrants used the standard rules anyway. We converted the few entries using the three-or-four rule before testing them.

The winning entries achieved fast generation speed (for interpreted Basic) through clever use of arrays. Emerson Perkins (Anaheim Hills, CA) wins an *80 Micro* T-shirt (the first we've awarded) for his Model III entry (Program Listing 1). Perkins' program produces a population histogram summarizing a completed run. When all cells have died or reached a static pattern (or when you press the Q key), the game ends and a bar graph appears showing population highs and lows through the course of Life. It's almost as interesting as watching the patterns of the game itself.

The program handles only small-scale patterns (a 14- by 14-character universe), and the histogram routine crashes with populations greater than 47 cells. The display scrolls up when cells appear on the bottom row, but recovers correctly on the next generation. Generation time is less than 10 seconds—fast enough to keep your interest. Perkins' Life game displays the current generation number and population size.

When the program starts, it prompts you to enter five rows, each containing up to 11 characters. The letter O represents a cell; a period represents a space. Spaces preceding the first cell in a row must be represented with a period. Spaces after the last cell in a row don't require representation, so just press the enter key. You can also press the enter key to represent an empty row.

The program centers your 5 by 11 pattern in the 14 by 14 playing area. The game stops automatically when population reaches zero or when the cell pattern becomes static. Pressing Q also stops the game after the current gener-

ation. You then press the enter key to see the histogram and again to start the next round. When typing this program in, remember to use Basic's edit mode to finish the long lines of code.

Alan Hensel (Cranbury, NJ) wins a bumper sticker for his Tandy 1000 speed demon (Program Listing 2). Even with a 39 by 21 universe, generation time ranges from 4–40 seconds, depending on the number of cells. The current generation number and cell population are displayed at the bottom of the screen.

Hensel provides full-screen editing to create Life cell patterns. With the Num Lock key on, press the 2, 4, 6, and 8 keys on the numeric keypad to move the cursor around the screen. Pressing the space bar makes a cell appear at the cursor. If you exceed the bounds, the program crashes. Press the enter key to get things going and control-break to stop. (You should be using Tandy version 1.01 of GW-Basic by now.)

One-Line Fun

This month, *80 Micro* revives the one-line game contest. In one line of Basic, shoehorn a smooth-working, mind-absorbing game. We've run this contest before, so we know it's possible. Your entry

must be original—no recycling from the earlier contest. The rules:

1. Owners of all TRS-80 and Tandy systems, with the exception of the Pocket Computers, are eligible. We'll consider degree of difficulty when comparing solutions created on different machines.
2. The deadline will always be the 15th of the issue month. Thus, this month's deadline is May 15. We realize that this doesn't give everyone the same amount of time to come up with their entries (we apologize to our overseas readers especially), but postponing the deadline any longer would add another month to our publishing the answers.
3. Speaking of the answers, they'll appear three issues from the issue in which the problem appears. Thus, this month's winners will make their appearance in the August 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 not required.

Late Prizes

We'll mail the *80 Micro* T-shirts and bumper stickers to winners of this and previous contests as soon as they are printed. We hope you'll find these rare artifacts worth waiting for. ■

Program Listing 1. Emerson Perkins' Model III Life program.

```

1 DEFINT A-Z:DIMP(16),R(16),H(500):B$=CHR$(23):W=10:U=16383:CLS:PRINT$"INPUT O'S":
FORI=5TO9:AS=B$:INPUT$ :FORL=LEN(AS)TOSTEP-1:P(I)=P(I)+P(I)-(MID$(AS,E,1)="O"):NE
XT:P(I)=P(I)*8:NEXT:CLS:FORG=PTOU:P=R:V=R:PRINT$,B$,G:FORK=RTOW:FORJ=RTO2:X=P(K+J
):L(J)=X/2
2 L(J+3)=X:L(J+6)=X+X:NEXT:M=L(4):A=M:FORL=1TO15:IFA,F=AAND1:PRINTMID$( ".O",P+1,1
):A=A/2:P=P+F:NEXTLSEE=15:NEXT:PRINT:L(4)=L(R):L=L(1):Y=R:N=R:FORI=2TO8:IFL(I)=RA
NDI<8,NEXTLSEC=L(I)ANDL:L=NOT(CORNOTL(I)ANDNOTL):S=CANDNOTYORNOCANDY:N=CANDYORN:
Y=S:NEXT
3 D=NOTNANDY:R(K+1)=MANDORDANDL:NEXT:W=14:B=R:PRINT$860,G;P"CELLS":FORL=WTOSTEP
-1:B=BOR(P(E)<>R(E)):V=VORP(E)ORR(E):W=W+(V=R):P(E)=R(E)ANDU:NEXT:H(G)=P:1PB*SGN(V
)=RORINKEY$="Q",INPUT$ :CLS:FORJ=RTOG:FORI=RTOH(J):SET(J,47-I):NEXTJ,J:INPUT$:RUN
ELSENEXT

```

End

Program Listing 2. Alan Hensel's Tandy 1000 Life program.

```

1 CLEAR,,2048:CLS:DEFINT A-Z:DIM A(40,22),X(999),Y(999),S(999),T(999):X=20:Y=11
R=1:WHILE T=13:LOCATE Y,X,1:PRINT STRINGS(R,L):T=ASC(INKEY$):X=X+(T=52)-(T
=54):Y=Y+(T=56)-(T=50):S=A(X,Y):R=(T=32)*(S=0):X(K)=X(Y(K))-Y:K=R+1:A(X,Y)=S+R*8
L=177:WEND:G=1
2 LOCATE 23,17,0:PRINT G;R:R=0:FOR M=0 TO K-1:X=X(M):Y=Y(M):FOR S=X+(X>1)TO X-(X
<9):FOR T=Y+1 TO Y-1 STEP(X=S)-1:L=A(S,T):A(S,T)=L+1:FOR R=R TO R-L:S(R)=S+T(R)
=T:NEXT:T=NEXT:NEXT:Y=0:LOCATE,,1:FOR X=0 TO R-1:T=T(X):SWAP Y,A(S(X),T):Y=T*
(Y=3)MOD 22
3 WHILE Y=S(X):LOCATE T,S:PRINT CHR$(177):X(K)=S:Y(K)=T:K=K+1:A(S,T)=8:Y=0:WE
ND:NEXT:G=G+1:FOR T=0 TO M-1:IF T=K THEN 2ELSE X=X(T):Y=Y(T):FOR R=0 TO A(X,Y)AN
D 14)=10:LOCATE Y,X:PRINT " ";R=R-1:X(T)=X(K):Y(T)=Y(K):T=T+(K<8):NEXT:A(X,Y)=8-
R*8:NEXT:GOTO 2

```

End

We have a complete line of the finest software available for only

\$29.95 each

INTRODUCTORY OFFER
(or order any three packages and pay only \$75.00)

Look at all of the features which our packages include!

You will discover that software doesn't have to be expensive to fill all of your needs. Our software runs on the IBM PC, XT, AT, PC Jr. and true compatibles. The accounting packages and WindowMaster require two floppy disk drives or a floppy disk and a hard disk drive.

THE General Ledger:

- Verifies all data input
- Totals entries to check balances
- Supports multiple departments or profit centers
- Proofs input data onto paper for auditing
- Lets you specify recurring journal entries
- On-line inquiry for account status
- Reports include: Income Statement, Balance Sheet, Chart of Accounts, General Ledger Report, Accounts Distribution Report, Trial Balance
- Prints Financial Statement in flexible, user-defined format

THE Accounts Payable:

- 5 transaction types: Release, Hold, Void, Prepaid and Credit Memos
- Access invoices for payment or inquiry
- Priority status or projected payment date available for each voucher
- Maintains numeric control over checks
- Complete payment information on voucher stub checks
- Computes discounts
- Writes automatic payables schedule
- Automatic vouchers for recurring items
- Allows partial payments
- Reports include: Aged Trial Balance, Two Pre-check Reports, Aged Cash Requirements, Vendor History Report, Check Register, Checks, Summary of Accounts Distribution Vendor List, Account List

THE Accounts Receivable:

- Balance forward or open item billing
- Automatic computation of late charges or interest rates
- Handle cash, C.O.D. or credit customers
- Specify any 3 invoice aging periods
- Print statements at any interval
- THE A/R posts cash receipts or invoices to customer accounts, types customer statements and reminder notices, and organizes and prints management information reports
- Automatically records recurring charges
- Reports include: Aged Trial Balance, On-Line Enquiry, Batch Proof, Accounts Distribution Report, Customer Statements, Customer Lists, Invoice & Cash Batch Proof, General Ledger Update
- Optional dunning letters

THE Order Entry:

- Processes invoices singly or in batches
- Up to 99 lines items per order
- Held (unshipped) items are marked on the Order Report
- THE O/E system automatically shows customer credit rating
- Each invoice depletes THE Inventory automatically
- Sends accounting transactions to THE Accounts Receivable
- Assign separate line item amounts to independent sales and receivables accounts
- Checks stock quantities in THE Inventory and notifies you when back orders are required
- Stock depletions will be automatically reported in THE Inventory
- Detailed invoice information
- THE Order Report provides urgent information on every order

THE Inventory:

- Perfectly suited to retail environment
- Simple transactions for: addition, deletion, alteration and examination
- Complete current statistics on each inventory item
- Activity statistics for current or to-date period
- Instant on-line inquiries
- Optional hard copy record of all inventory transactions for auditing
- 13 digit, user-definable alphanumeric part number
- 30 character description field
- Reports include: Activity Report, Valuation Report, Auditability Proof, Reorder Report, Item List, and Item File Print

THE Payroll:

- Handles any combination of weekly, biweekly, semi-monthly & monthly pay schedules
- Define up to 20 earning or deduction categories for all employees
- Assign any 8 categories for each employee
- Accountants can perform after-the-fact payroll processing
- Prints information for government reports
- Salary expenses can be distributed to different departments, branches or profit centers
- System includes safeguards and verification procedures
- Reports Include: Company History, Pay Transaction Proof, Calculations Proof, Employee History, Employee Master List, Check Register, Payroll Journal, Vacation report, 940 & 941 Reports, W2 Forms, & Prints Checks
- Of course, THE Payroll calculates payroll including Federal & State taxes, prints checks, allows hand written checks, lets user maintain tax tables and keeps an extensive employee payroll history

THE Name & Address System:

- Create name & address files
- Print mailing labels
- Sort files by up to 4 items
- Search or sort by match or range
- Print a report of a NAD file
- Merge files
- 88 character open reference field
- Sort by any character in reference field
- 10 number zip code

THE Spreadsheet:

- On-line tutorial
- Cut & paste multiple spreadsheets
- Format: Global, Column, Row, Entry
- Arrays: Copy, Replicate, Move, Insert, Delete, Blank
- Labels: centered, right or left justified
- Variable cell width
- 2 Windows to view separate areas of worksheet
- 20 special math functions
- Manual or automatic recalculation
- Complete glossary of spreadsheet terms
- Maximum spreadsheet size: 255 Rows x 64 Columns
- Variable print formatting options
- Simple editing functions
- Status on contents of any cell
- Set hold on any row or column to prevent scrolling
- On-line help

THE Wordprocessor:

- On-line help
- Powerful editing: Erase, Copy or Cut & Paste characters, words, sentences, lines, paragraphs, pages, or user-defined blocks of text
- Automatic word wrap-around (may be turned off)
- User-defined page breaks, soft hyphen, tab, indent and margin settings
- Proportional & justified printing
- Global Search & Replace, Automatic & Examine
- Optional command character viewing
- Superscript and subscript
- Phrase files for boilerplate
- Print bold, centered, underline
- Edit ASCII files
- Right or left justification
- Hyphenation

THE Mailmerge:

- Integrates THE Wordprocessor & THE Name & Address System
- Mass mailings
- Specialized mailings to select groups in your Name & Address System.
- Can read A/R customer file, A/P vendor file and payroll employee file so you may send customized Wordprocessor letters

WindowMaster:

Our windowing system lets you integrate your application programs. You can run up to 7 applications simultaneously. Run THE Payroll and print checks while you are using THE Wordprocessor. Or enter orders with THE Order Entry while THE Spreadsheet performs a lengthy calculation and THE Mailmerge prints letters for a mass mailing. The simple inter-window transfer feature allows you to pass data from one application to another. The powerful keyboard enhancer lets you program keys on your keyboard to perform special functions which would otherwise require many keystrokes. You can also redefine keys. WindowMaster integrates your IRE applications and enhances your computer.

CALL TODAY TOLL FREE:

1-800-227-2400

Ask For Extension 931

In California:

1-800-772-2666, Ext. 931

(Lines Open 24 Hours, 7 Days a Week)

FOR MORE INFORMATION CALL:

(415) 268-1435

ACCOUNTING PACKAGES: FULLY INTEGRATED OR STAND-ALONE WITH COMPLETE AUDIT TRAILS

Indian Ridge Enterprises, Incorporated

508 Second St., Oakland, CA 94607 Dept. 80

\$29.95 each or \$75.00 for any 3 packages. Please include Shipping & Handling charges listed below. Credit Card Orders by Phone OR Send Check OR Money Order with Coupon. Sorry, No COD's or Purchase Orders.

- | | | | |
|--|--|--|--|
| <input type="checkbox"/> THE General Ledger | <input type="checkbox"/> THE Order Entry | <input type="checkbox"/> THE NAD System | <input type="checkbox"/> THE Mailmerge |
| <input type="checkbox"/> THE Accounts Payable | <input type="checkbox"/> THE Inventory | <input type="checkbox"/> THE Spreadsheet | <input type="checkbox"/> WindowMaster |
| <input type="checkbox"/> THE Accounts Receivable | <input type="checkbox"/> THE Payroll | <input type="checkbox"/> THE Wordprocessor | |

- | | | | |
|--------------------------------|--------------------------------------|-------------------------------|-------------------------------------|
| <input type="checkbox"/> Check | <input type="checkbox"/> Money Order | <input type="checkbox"/> VISA | <input type="checkbox"/> MasterCard |
|--------------------------------|--------------------------------------|-------------------------------|-------------------------------------|

Account No. _____ Expiration Date _____

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____ Signature _____

1 or 2 Packages — Add \$7.50 Shipping & Handling

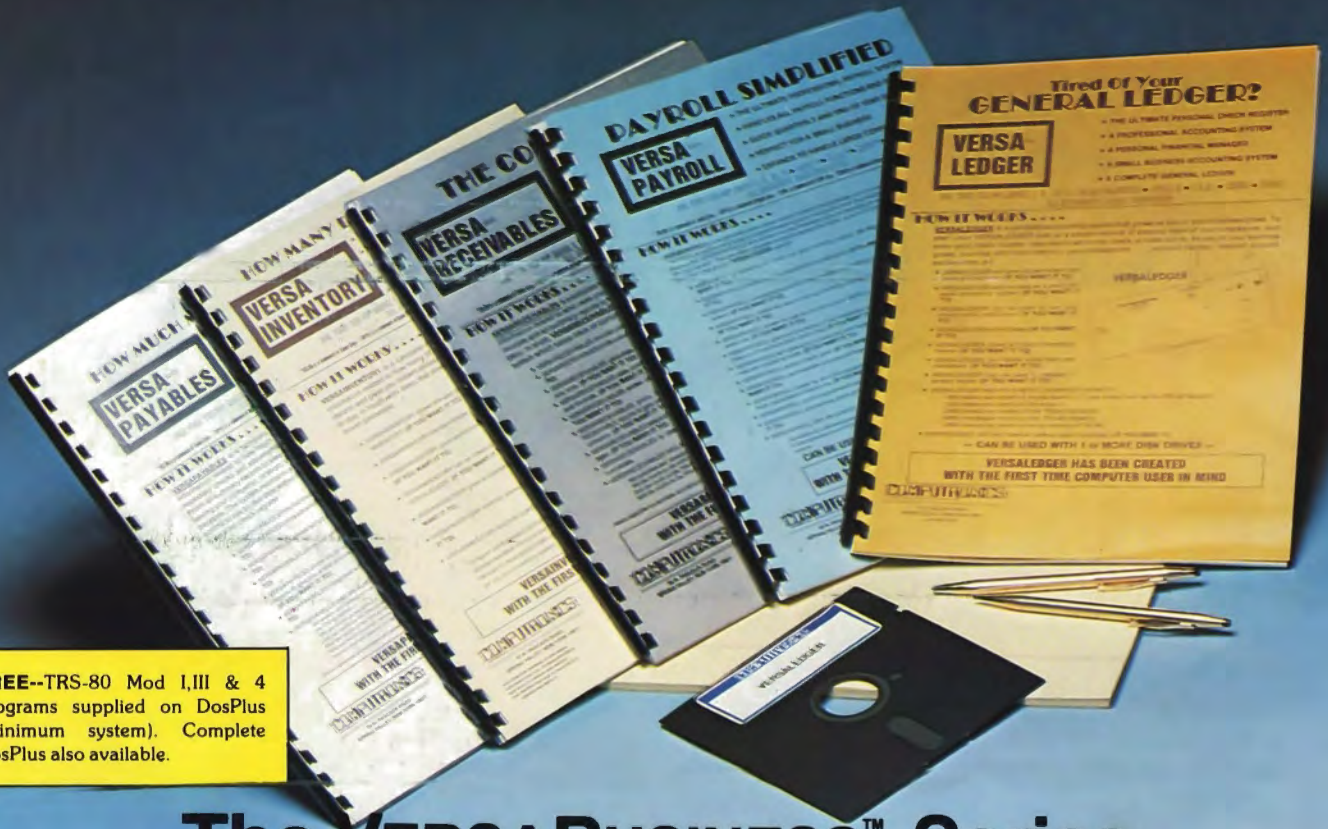
3 to 5 Packages — Add \$10.00 Shipping & Handling

5 to 10 Packages — Add \$15.00 Shipping & Handling

California Residents add 6½% Sales Tax. Outside US add \$15.00 and payment must be made by bank draft payable in US by US Dollars.

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • KAYPRO™



FREE--TRS-80 Mod I, III & 4 programs supplied on DosPlus (minimum system). Complete DosPlus also available.

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 VERSALEDGER 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 VERSALEDGER 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.

VERSALEDGER II™ **\$149.95**
VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER 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.**

- VERSALEDGER 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.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

SATISFACTION GUARANTEED!

Every VERSABUSINESS™ module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any VERSABUSINESS™ module, you may return it within 30 days for a refund. Manuals for any VERSABUSINESS™ module may be purchased for \$25 each, credited toward a later purchase of that module. All CP/M-based Computers must be equipped with Microsoft BASIC (MBASIC or BASIC-80)

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 \$4 for C.O.D. or non-UPS areas

- * add \$5 to CANADA or MEXICO
- * 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