

80micro

A CWC/I PUBLICATION

February 1985
USA \$4.00
Canada \$4.50

the magazine for TRS-80* users

What's the Difference?

How TRS-80 Basics Compare and Contrast

Young Programmers Show Their Work

Business Graphs On the Model I/III

Also:
2000 Plus
Project 80
BBS Express
The Next Step
Basic Takes
Ask Tandy

PRINT @Ø, "Whatever"

NO!
LOCATE 1,1:
PRINT "Whatever"

and...
RS:X=
RND(1Ø)

NO!
X=RND
(1)*9+1



SOMETIMES THE QUESTIONS CAN FAR OUTNUMBER THE

Take control with our new Model 4 Inventory

Start Using a System of Your Own Design

Admit it. You'd like to be able to design an inventory system better than the paper monster in your file cabinets right now.

You'd design a system that's easy for your employees to use, one that makes information available in the order you need it. And you'd design a system that makes sense for your particular business.

We understand. In fact, we've got just what you're looking for. Our Inventory Control and Profile 4 Plus are professional software packages anyone can use and that you can tailor to meet the specific needs of your business.

We Made Them Fast and Efficient. You Make Them Perfect

There's no special catch, no complicated manuals to learn. Our software comes to you ready to use. You don't need to be able to program—you don't even need any specialized computer skills. Just load either program, answer a few plain-English questions, and you've got a system you can use the way you want to.

Inventory Your Way

Just enter your business' inventory levels and reorder points into Inventory Control (26-1545, \$199.95). Then, whenever an inventory item drops below your designated stock

level, Inventory Control will print a reorder report and the number of inventory items on hand. Inventory Control allows physical inventory count to be taken by cycle and lets you automatically reorder stock. It keeps you up to date with nearly 20 types of reports, including nine you can easily customize to the unique features of your business, and processes up to 100 vendors, 50 purchase orders, 1200 inventory items and 350 purchase order line items.

But best of all, Inventory Control does all this with computer speed and efficiency, eliminating the need for reams of inventory sheets and confusing tables. The information you need stays organized and at your fingertips.



ABOUT YOUR INVENTORY INVENTORY IN QUESTION.

Control and Profile 4 Plus software.

Create Your Own Office Filing System

Profile 4 Plus (26-1635, \$249.95) is the successful combination of our user-proven Profile filing system and new enhancements—"Pluses" that give you even more flexibility for data handling.

Profile 4 Plus makes it easy to keep track of price lists, vendor and customer records, personal projects and more. Need a list of your stock in ascending price order? Or a list of customers who spent more than \$150 last month? Profile 4 Plus makes it easy. Just enter a few key-strokes and your information appears. Compare that to the amount of time a similar search would take using paper files.

The Perfect Computer for Either Program

We even have the perfect computer for these programs. The Model 4P (26-1080, \$1299.00) features two built-in 184K floppy disk drives, a big 80-character by 24-line

screen, comfortable typing keyboard, convenient portability and much more. Or use our Model 4 (26-1069, \$1299.00), with a 12-inch monitor and greater expandability.

See all three today at your Radio Shack Computer Center, and start using inventory and filing systems you can call your own.

Available at more than 1200
Radio Shack Computer Centers and at
participating Radio Shack stores and dealers

Radio Shack®
COMPUTER CENTERS

A DIVISION OF TANDY CORPORATION

Prices apply at Radio Shack Computer Centers and at participating Radio Shack stores and dealers. Inventory Control requires 132-column printer or 80-column printer with 132-column condensed/format capability.



Send me a New 1985 Computer Catalog RSC 14.
Mail To: Radio Shack, Dept. 85-A-409, 300 One Tandy Center, Fort Worth, TX 76102

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
PHONE _____

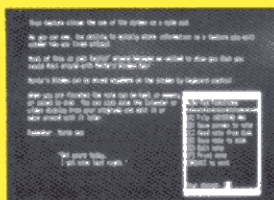


MONTUZUMA MICRO

PRESENTS

MONTÉ'S WINDOW™

NOTEPAD



**WINDOWS ON
YOUR MODEL 4!**

411



REQUIREMENTS

Montezuma Micro CP/M®
2.2 version 2.21+

128K RAM

Model 4 or 4P

8-bit Fever

DATE	INVOICE #	DESCRIPTION	QUANTITY	PRICE	PRICE PER	VARIANCE	AMOUNT	TOTAL
07/05/84	159222	Monte's Window	1	1575.00			1575.00	
07/06/84	159292	Monte's Window	1	525.00			525.00	
07/10/84	159279	Monte's Window	1	1800.00			1800.00	
07/10/84	159280	Monte's Window	1	975.00			975.00	
07/10/84	159321	Monte's Window	1	220.00			220.00	
07/10/84	159436	Monte's Window	1	250.00			250.00	
08/03/84	160190	Monte's Window	1	400.00			400.00	
08/03/84	160250	Monte's Window	1	440.00			440.00	
08/03/84	160406	Monte's Window	1	707.50			707.50	
08/03/84	161410	Monte's Window	1	2100.00			2100.00	
08/03/84	161551	Monte's Window	1	400.00			400.00	
09/06/84	161636	Monte's Window	1	1312.50			1312.50	
09/06/84	161641	Monte's Window	1	707.50			707.50	
10/09/84	163266	Monte's Window	1	5,250.00			5,250.00	

CALENDAR



**TAKES NO
USER RAM!**

CALCULATOR

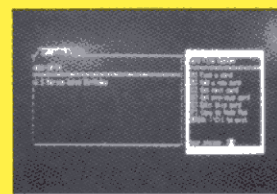


Pop Up Menus!

\$49

Easy to Use!

INDEX CARD FILE



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

Once Upon A Time,

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

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.

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

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

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

411

"WE KEEP YOU RUNNING"



SAVE TIME
WITH
FASTER



FASTER speeds up most TRS-80 BASIC programs by 20-50%. It analyses programs while they run, then displays a simple change to sequence variables so the ROM will find them faster.

You can use FASTER to speed up programs you've bought as well as programs you've written.

"If you... would like a significant increase in the run-time speed, then buy FASTER."

80 MICRO (April, 1982)

Models I & III, 16-48K Tape or Disk, all DOS's. **\$29.95**

QUICK COMPRESS

This ultra-fast machine language program reduces the size and increases the speed of most BASIC programs. It removes blanks and remarks in less than 3 seconds.

Models I & III, Tape or Disk **\$19.95**
SPECIAL: FASTER & QUICK **\$39.95**

ERRATIC Disk Drives?

RPM TO THE RESCUE



Find out if your drives need adjustment before you begin to lose files. **SAVE** on repair bills. This easy-to-use program measures the rotational speed and fluctuations of your disk drives, and warns you if they are running too fast, too slow, or unevenly.

80 MICRO (April, 1982) said: "If your drives have problems I recommend RPM before paying to get it repaired."

Customers agree:

"EXCELLENT — Has paid for itself already! Saved the cost of Radio Shack's doing the speed adjust!" (D.M.)

Models 1, 3 and 4 (in 3 mode). We suggest you order a copy before you need it.

RPM \$24.95 ✓2

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

PROSOFT

Dept. G, Box 560, No. Hollywood, CA 91603

(818) 764-3131 Information and Same-Day Processing

TERMS: VISA, MC, checks, COD. Please add \$2.00 shipping in U.S. or Canada; \$5.00 overseas; sales tax in CA. Most orders filled within one day.

CUT YOURSELF LOOSE WITH TRASHMAN™



THIS PROGRAM IS A MUST FOR EVERYONE WHO USES "BASIC" ON A TRS-80. It reduces string compression delays by 95% or more. You suffer from these delays whenever you run a BASIC program. Your computer locks up for seconds, or minutes, and you may even think it's "crashed."

TRASHMAN FIXES THE PROBLEM! As soon as you start to use it, those delays will almost disappear. The program is very easy to use, so you don't have to be a computer programmer to take advantage of it. It's written in "machine language" and uses only 578 bytes of memory for itself, plus 2 bytes for each "string" in your program. It works with other machine language programs and all the major operating systems.

IT SHOULD HAVE BEEN BUILT INTO THE COMPUTER IN THE FIRST PLACE, but since it wasn't, look at this chart, and then order your copy today.

# STRINGS	SECONDS DELAY NORMAL	PERCENT IMPROVEMENT
10	.1	.1
250	11.8	0.7
500	45.8	1.6
1000	179.6	3.5
2000	713.2	7.8

Note: Not for use with The Home Accounting.

"...in those programs that use hundreds of strings arrays, the time saved is outstanding." 80 MICRO, Jan. '83

Works great, had 45 sec. delays in printing, now almost no delays. D.T.

"We have installed TRASHMAN in one of our most major programs and it has reduced the run time by over one-third! A.W.L.

TRASHMAN is available on Disk for the TRS-80 Models I & III for just **\$39.95** ✓1

Attention: Software Publishers: TRASHMAN may be licensed for use with your packages. Call for details.

PUBLISHER
Peter Hutchinson

EDITOR-IN-CHIEF
Eric Maloney

MANAGING EDITOR (EDITORIAL)
Peter E. McKie

MANAGING EDITOR (PRODUCTION)
Deborah M. Sargent

REVIEW EDITOR
Ryan Davis-Wright

COPY EDITORS
Robert Mitchell (New Products)
Penelope Hamblin

ASSISTANT EDITOR
Catherine Geary

TECHNICAL EDITORS
Bradford N. Dixon
Mare-Anne Jarvela
Keith Johnson (Load 80)
Dave Rowell
Beverly Woodbury

EDITORIAL ADMINISTRATION
Carole Macioci

ASSOCIATE EDITORS

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

ADVERTISING SALES

SALES MANAGER
William Smith

SALES REPRESENTATIVES
Richard J. Alden
Michael Wozmak
1-800-441-4403

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

SALES MANAGER
Giorgio Saluti

SALES REPRESENTATIVES
Alison Walsh
Karen Letendre

MPA



Cover by Tim Lewis

The left bracket, [, replaces the up arrow used by Radio Shack to indicate experimentation on our printouts. When entering programs published in 80 Micro, you should make this change.

80 formats its program listings to run 64 characters wide, the way they look on your video screen. This accounts for the occasional wrap-around you will notice in our program listings. Don't let it throw you, particularly when entering assembly listings.

Article submissions from our readers are welcomed and encouraged. Inquiries should be addressed to: Submissions Editor, 80 Pine Street, Peterborough, NH 03456. 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, Scrapsit, and TRSDOS are trademarks of Radio Shack, a division of Tandy Corp.

80 Micro (ISSN: 0744-7888) is published monthly by CW Communications/Peterborough Inc., 80 Pine St., Peterborough, NH 03456. Phone: 603-924-9471. Second class postage paid at Peterborough, NH, and addition at mailing offices. Subscription rates in U.S. are \$24.97 for one year, \$36 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 782615, 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.

Entire contents © copyright 1984 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 42



page 48



page 62

On the Cover

- 42. The GW Difference** *by Jim Heid*
Basic training for Tandy 1000/1200 owners, from GW Basic's commands to converting Model I/III/4 programs.
- 48. Young Programmer's Awards 1984-85**
The kids are all right, and this year's batch of winning programs is as impressive as ever.
- 50. Monster Mashing**
by Michael Lewicki and James Karls
15-18-Year-Old Category
Explore and conquer five dungeons where Hobgoblins and Lizardmen play. (Model III)
- 56. Picture This** *by Jeff Reifman*
12-14-Year-Old Category
A graphics program with plenty of frills. (Model III; Load 80)
- 59. The Pecking Order** *by Jeffrey D. Zare*
11-Year-Old-and-Under Category
This game separates the 3's from the 10's. (Models I and III; Load 80)
- 68. By the Numbers** *by Arnold E. van Beverhoudt Jr.*
Create, edit, and display professional-looking bar and line graphs. (Models I and III; Load 80)

Feature

- 62. Labor Saver** *by Hardin Brothers*
How to take some of the drudgery out of Assembly-language programming.

Departments

- | | |
|---|--|
| 6. Load 80 Directory | 83. Tidbit #18 |
| 8. Side Tracks
<i>by Eric Maloney</i> | 93. Project 80
<i>by Roger C. Alford</i> |
| 12. Input | 104. BBS Express
<i>by J. Stewart Schneider and Charles E. Bowen</i> |
| 16. Feedback Loop
<i>by Terry Kepner</i> | 108. Basic Takes
<i>by Richard Ramella</i> |
| 21. Pulse Train | 112. The Next Step
<i>by Hardin Brothers</i> |
| 29. Reader Exchange | 119. 2000 Plus
<i>by John B. Harrell III</i> |
| 33. Debug | 136. New Products |
| 35. Reviews
<i>Let's Talk</i>
<i>xT.CAD</i>
<i>Checkbook Plus</i>
<i>DISnDATa</i>
<i>List/Key</i>
<i>Fullview Word Processor</i> | 144. Ask Tandy |

LOAD 80

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, you must convert the programs from Model III TRSDOS to Model 4 disk using the Model 4 CONV 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 key 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 \$21.97 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 1-800-645-9559 between 9 a.m. and 5 p.m. Or, you can write to *80 Micro*, Subscription Department, P.O. Box 981, Farmingdale, NY 11737.

Directory

Graph

Article: Picture This (p. 56)
System: Model III, 48K RAM
Language: Assembly

Graphics program that lets you create pictures, and combine up to nine screens for a composite illustration.
Cassette filespec: GRAPH5 (source code), GRAPH (object code)
Disk filespec: GRAPH/SRC (source code), GRAPH/CMD (object code).
Source code requires Radio Shack Editor/Assembler.

Noeaters

Article: The Pecking Order (p. 59)
System: Models I and III, 16K RAM cassette, 32K RAM disk
Language: Basic

Gobble up the numbers on the screen to win the game.
Cassette filespec: B
Disk filespec: NOEATERS/BAS

Grafmaster

Article: By the Numbers (p. 68)
System: Models I and III, 16K RAM cassette, 32K RAM disk
Language: Basic

Plots and displays data in line or bar charts.
Cassette filespec: C
Disk filespec: GRAFMSTR/BAS

Demo

Article: The Next Step (p. 112)
System: Models I and III, 32K RAM
Language: Assembly

Use DOS exits to add commands to Basic.

Cassette filespec: DEMOS, DEMOC
Disk filespec: DEMO/SRC (source code), DEMO/CMD (object code).
Source code requires Apparat editor/assembler.

BBS

Article: BBS Express (p. 104)
System: Model III, 48K RAM, two disk drives
Language: Disk Basic

Sort and search programs for your BBS.

Cassette filespec: D
Disk filespec: BBS9/BAS

Mail List

Article: Special to Load 80
System: Model 4, 64K RAM
Language: Assembly/Basic

This mailing list program handles up to 900 labels per disk, arranges labels by name or zip code, and inverts first and last names. No related article in *80 Micro*: Program and documentation on Load 80 only.
Cassette filespec: ARTICLE-1 (ASCII text file), ARTICLE-2 (ASCII text file), F, G, H, I, J, K, SORT (object code), NAME (object code)
Disk filespec: ARTICLE1/ASC (ASCII text file), ARTICLE2/ASC (ASCII text file), MENU/BAS, CREATE/BAS, EDIT/DEL, SORT/BAS, MASTER/BAS, PRINT/BAS, SORT/CMD (object code), NAME/CMD (object code)

ART DIRECTOR
Beth Krommes
PRODUCTION SUPERVISOR
Dion Owens
PRODUCTION ASSISTANT
George Gardos
AD/GRAPHICS PRODUCTION
Gary Ciocci

MANUFACTURING CONSULTANT
Susan Gross
TYPESETTING MANAGER
Dennis Christensen
FILM PREPARATION MANAGER
Robert M. Villeneuve
DARKROOM MANAGER
Nathaniel Haynes

VICE PRESIDENT/GENERAL MANAGER
Debra Wetherbee
VICE PRESIDENT/FINANCE
Roger Murphy
ASSISTANT GENERAL MANAGER
Matt Smith
ASSISTANT TO VP/FINANCE
Dominique Smith
DIRECTOR OF MARKETING SERVICES
Pamela Esty
DIRECTOR OF CIRCULATION
William P. Howard
ASSISTANT CIRCULATION MANAGER
Frank Smith
DIRECT AND NEWSSTAND SALES MANAGER
Ralph Wirein
1-800-343-0728
DIRECTOR OF CREDIT SALES
AND COLLECTION
William M. Boyer
EXECUTIVE CREATIVE DIRECTOR
Christine Destrempe
PUBLIC RELATIONS
Michele Christian
FOUNDER
Wayne Green

80 Micro is a member of the CW Communications Inc. group, the world's largest publisher of computer-related information. The group publishes 52 computer publications in 19 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's *ComputersWorld/Argentina*, Australia's *Australia ComputersWorld*, Australia's *Micro Computer Magazine*, Australia's *PC World and Directories*, Brazil's *InfoVirus* and *MicroMundo*, China's *China ComputersWorld*, Denmark's *Computerworld/Danmark* and *MicroVerden*, Finland's *Micro*, France's *Le Monde Informatique*, Golden Apple and *PC (IBM)*, Germany's *Computerwoche*, *Microcomputerwelt*, *PC Welt*, *Software Markt*, *CW Edition/Seminar*, *Computer Business* and *Commodore Magazine*, Italy's *Computerworld Italia*, Japan's *Computerworld Japan* and *Perso Com World*, Mexico's *ComputersWorld/Mexico* and *CompuMundo*, Netherlands' *CW Benelux* and *MicroInfo*, Norway's *Computerworld Norge* and *MicroData*, Saudi Arabia's *Saudi ComputersWorld*, Singapore's *The Asian ComputersWorld*, Spain's *ComputersWorld/Espana* and *MicroSistemas*, Sweden's *ComputersSweden*, *MicroData* and *Min Hemdat*, the UK's *Computer Management* and *Computer Business*, Europe: the U.S.' *Computerworld*, *HOT CoCo*, *Infider*, *InfoWorld*, *Mac World*, *Micro Marketworld*, *PC World*, *Run*, *73 Magazine* and *80 Micro*.

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 Lori Eaton, 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 Ralph Wirein, Retail Sales Manager, *80 Micro*, Pine St., Peterborough, NH 03458, (800) 343-0728.



You've Got TOTAL ACCESS

(specializing in TRS-80™)

TO YOUR COMPUTER HARDWARE & SOFTWARE
NEEDS. CALL ROSE TODAY!

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. Add \$5 per drive shipping unless otherwise specified. All drives have a one year warranty on parts and labor.

COMPLETE FULL SIZE 5.25" DISK DRIVES

40tk Single Side Tandem TM100-1.....	\$ 169
40tk Dual Side Tandem TM100-2.....	209
80tk Dual Side Tandem TM101-4.....	279

COMPLETE HALF-HIGH 5.25" DISK DRIVES

1ea. 40tk SS TEAC FD-55A in dual case.....	\$ 189
2ea. 40tk SS TEAC FD-55A in dual case.....	324
1ea. 40tk DS TEAC FD-55B in dual case.....	243
2ea. 40tk DS TEAC FD-55B in dual case.....	424
1ea. 80tk DS TEAC FD-55F in dual case.....	297
2ea. 80tk DS TEAC FD-55F in dual case.....	522

COMPLETE 8" DISK DRIVES

Add \$10 shipping per 2-drive case

2ea. SS TM848-1E's in dual case with fan.....	\$ 699
2ea. DS TM848-2E's in dual case with fan.....	799

BARE 5.25" & 8" DISK DRIVES

Add \$4 shipping per drive

40tk SS, Full Size, Tandem TM100-1.....	\$ 129
40tk DS, Full Size, Tandem TM100-2.....	169
80tk DS, Full Size, Tandem TM101-4.....	239
40tk SS, Half-High, TEAC FD55-A.....	129
40tk DS, Half-High, TEAC FD55-B.....	169
80tk DS, Half-High, TEAC FD55-F.....	239
8" SS, Thinline, Tandem TM848-1E.....	290
8" DS, Thinline, Tandem TM848-2E.....	360

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.....\$ 199

OTHER DRIVE GOODIES

Add \$2 shipping

TRSDOS 1.3 Disk & Manual for Model III.....	\$ 23
TRSDOS 2.3 Disk & Manual for Model I.....	23
TRSDOS 6.x Disk & Manual for Model 4.....	29
LDOS for the Model I or III.....	69
NEWDOS 80 v2.0 for the Model I or III.....	93
2-drive cable for Model I/III/4.....	24
2-drive cable for IBM PC.....	40
4-drive cable for Model I.....	34
Extender cable, 7' long.....	13
5.25" power supply & encl., white or silver.....	59
8" power supply, fan & enclosure, beige.....	159

TRS-80 MODEL I DOUBLE DENSITY CONTROLLERS

Add \$3 shipping

Aerocomp "DDC" Really the best by test.....	\$ 99
Aerocomp "DDC" with LDOS.....	149
Aerocomp "DDC" with NEWDOS 80-v2.0.....	189
LNDoubler 5 1/8" if you need 8" drives.....	169

MEDIA & SUPPLIES

5" Diskettes SSDD, Lifetime Guarantee. Pk of 10.....	\$16
5" Diskettes DSDD, Lifetime Guarantee. Pk of 10.....	21
5" Flipart, holds 75 Diskettes.....	19
8" Diskettes SSDD, Lifetime Guarantee. Pk of 10.....	29
8" Diskettes DSDD, Lifetime Guarantee. Pk of 10.....	34
8" Flipart, holds 50 Diskettes.....	29
5.25" or 8" Head Cleaning Kit.....	9
Letter Size 20 lb. Tractor Paper, 2900 sheets.....	25

TRS-80 SPECIAL EQUIPMENT

12" Green Phosphor Monitor.....	79
12" Amber Phosphor Monitor.....	84
16K 200 nsec RAM Guaranteed 1 year (8 chips).....	13
64K 200 nsec RAM Guaranteed 1 year (8 chips).....	64
64K RAM plus Genuine PAL for Model 4 upgrade.....	74

ROSE GETS RIGHT! NOW---ROSE'S MOD 4 CP/M \$ 69

Complete with Manual

Rose has developed this streamlined version of CP/M 2.2 that lets you run most of your favorite CP/M programs. They are in stock, ready to ship to you at this unprecedented low price.

SPECIAL SOFTWARE DEALS

WordStar 3.3 (Specify MM or R/S format).....	\$ 250
MailMerg, SpellStar, Starindex.....	220
WordStar Professional (Above 4 Programs).....	450
DataStar Data Entry & Retrieval.....	175
ReportStar Report Generator.....	150
InfoStar Advanced DBMS (Above 2 Programs).....	300
dBASE II Complete With Disk Tutorial.....	385
Super Utility Plus 3.2 by Kim Watt.....	59
CP/M 2.2 for Model 4 by Monte Zuma.....	199
Pickles & Trout CP/M 2.2m for the Model 2-12-16 Floppy Version.....	179
Same thing but the Radio Shack Hard Disk.....	219

Please add \$5 handling charge to orders under \$50

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 Documentation Fee if order is \$500.00 or more. Texans add State Sales tax. No tax collected on shipments outside of Texas. Be sure you know what you are buying. SOFTWARE IS SOLD ON A REPLACEMENT BASIS ONLY - NO REFUNDS. If it is defective call us for instructions. Please order from me now---I need the money and I will not jack you around. 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

Copyright 1984 by Total Access

TRS-80 is a Trademark of the Tandy Corporation
CP/M is a Trademark of Digital Research

CP/M® & 80 COLUMN FOR YOUR MODEL III

No need to buy a new computer when you can use the Holmes VID-80 CP/M, 64K RAM and 80 column modification. This kit is easy to install and requires no soldering. You 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. Now you will be able to use most of the CP/M programs that normal people do, such as dBASE II and WordStar. The regular cost of this kit is \$524.00. Now Rose will fix you up for only..... **\$399**

SUPER SALE

Same as above except complete with WordStar 3.3 installed and ready to run. Only..... **\$499**

PRINTERS & ACCESSORIES

ANADIX DP-9725, 240cps plus COLOR.....	1395
PROWRITER 120cps, 10" Wide Friction/Tractor.....	339
PROWRITER 2, 120cps, 15" Wide Frict/Trac.....	595
STARWRITER F10-40cps Daisy Wheel.....	995
LPRINTMASTER F10-55cps Fast Daisy Wheel.....	1199
Rutishauser Bidirectional Tractor.....	199
Rutishauser Sheet Feeder, A Best One.....	695
A Good, Cheap Sheet Feeder for the F10's.....	475

Selling Out At Comdex

A successful company cannot simply have a good product. It must also present a forceful and distinctive image to the industry, consumers, and media. If November's Comdex show in Las Vegas was any indication, many, if not most, software vendors fail miserably at this. They haven't learned even the most rudimentary of marketing and presentation skills. The result is that a lot of companies are going to fall into a black hole this year, taking with them some decent software.

Let me cite a couple of examples. Case #1 is that of the manufacturer of a reasonably well-known word processor that I'll call SuperCursor. In the booth were a couple of IBM PCs. The company president sat slouched on a stool. I walked over to the PC at his right and found to my surprise that it was not running SuperCursor, but a series of screens that merely explained what the product was.

Hmmm, I thought. This isn't terribly exciting.

After a few minutes, the president noticed me (I was the only one in the booth), and asked if I had any questions.

"Will it run on the Tandy 1000?" I asked.

"That's their new portable, right?" he responded.

Here was a man who clearly knew what was going on in the market.

I moved on. SuperCursor could be the greatest word processor ever written, but I'll never know.

Case #2 involves the vendor of a data base manager (or was it a data communications program?). The company had a fairly impressive booth in one of the main halls, with lots of computers running their product and an army of people giving demonstrations. I asked the same question:

"Will it run on the Tandy 1000?"

"I really couldn't tell you that."



"Do you plan to test it on the 1000?"

"I don't know."

"Is there anyone here who does know?"

"Well, we're just salespeople. Someone at our hospitality suite might be able to tell you...."

End conversation. Why should I waste my time going to a hospitality suite to get one simple question answered?

These are not isolated situations. Comdex had a seemingly endless supply of indolent, insolent, and ignorant exhibitors. Most companies are not well enough established to afford such behavior. Good luck to them—they're going to need it.

It's no coincidence that the most successful software manufacturers generally show a touch of class. Take Infocom. By their own admission, few announcements could be more boring than that of a new data base manager. Yet Cornerstone, their first business package, received much favorable attention. The primary reason was not so much the product itself, but because people feel good about Infocom. This is an outfit run by a helpful, intelligent, knowledgeable, genuinely likable staff.

Other companies that show some style are Lotus, Ashton-Tate, MicroPro, and Microsoft. But for the most part, walking the floor of Comdex is like cruising car dealers on Miracle Mile; the names are different, but just about everything else is the same. I left with the feeling that if every company randomly swapped its products and personnel with everyone else, hardly anyone would notice.

Something Old, Something New

TRS-80 people are hard to please. They expect each new computer to be the ultimate in new technology. So some folks will be disappointed that the Model 200 is not a significant breakthrough in portable computing. They wanted an MS-DOS compatible with 1 megabyte of memory, a 24-line by 80-column color LCD, and the top 30 software packages bundled in ROM. What they got is an upgraded 100.

The Model 200 is to the 100 what the Model III was to the Model I. It's more nicely packaged and has a few interesting modifications, but it's still basically the same computer.

Personally, I don't care about MS-DOS compatibility. I was happy enough to see that Tandy listened to customer complaints and took care of some of the 100's nagging problems. The cursor keys are now in a more convenient cluster, the pause/break key has been moved to the upper left corner for easier reach, and the expansion bus is at the rear of the computer instead of underneath. And, of course, there's the 16-line by 40-column flip-up screen, which gives you more room to work with without resorting to an impossible-to-read 80-column display.

We'll be giving the 200 a thorough review in a future issue. Until then, I recommend you stroll on down to your local Radio Shack and have a look. ■

NEW!

OUTLINE **CAMEO** **Pretorian**
Rotunda **LOMBARDIAN** **celtic**
Nostalgia **INCISED TRAJAN** **Playbill**
LIQUID CRYSTAL **Old English** **CHAINED**
MOON LITE **CLIMBING** **USA** **ANTIQUE**
BANNER *Elegant* **REV BAN**
SHADOW **ROMAN** **CITY** **Mini Cubes**
Chancery Medium **BELLS** **Small Boldface**
CIRCUS **Music** **Bricks** **Small Bold Italics**

These were printed by DOTWRITER on an Epson MX-80.

See What You Can Do With DOTWRITER 4.0!

Now available for the Model 4, too!

DOTWRITER lets you create spectacular, eye-catching letterheads, catalogs, invitations, or even books. It is just what you need to turn your dot-matrix printer into a versatile typesetting machine. And it's available for the Model 4 (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 (white on black), and even print right-justified proportional text.

DOTWRITER includes the printing program, complete documentation, and fourteen useful sets of typefaces (60 to 90 characters in each set). We will also give you the 105-page Letterset Reference Catalog free with your order.

To use DOTWRITER, just write your text with any popular TRS-80 Word Processor, add the necessary format-

ting commands, and DOTWRITER will do the rest.

25 more disks are available separately. Each has 3-12 complete typefaces (60-95 characters in each set).

These disks cost less than \$25 each, and may be purchased at any time.

If you want to create your own logos, modify our typefaces, or even design entirely new typefaces, then you will also want to order the "Letterset Design System" (LDS). We offer LDS at half-price when you order it along with DOTWRITER. LDS operates in Model III mode on the Model 4.

Versions are available for Epson MX-80 with Grafrax, MX-100 with Grafrax-Plus, RX-80, FX-80, C. ITOH 8510/1550, Microline 84/92/93; Radio Shack's DMP series 200-2100, CGP-220 & Gemini 10X, 15X. Please specify printer and computer!

Our print samples were done on an Epson. Sizes vary on other printers. Some of the samples shown here are taken from the additional Letterset disks.

Two disk drives and at least 48K of memory are required. LDS is not available in native Model 4 mode.



Send for free print samples!

We've only shown you a few of the 180 DOTWRITER fonts. If you want the best in graphics printing, we suggest you order DOTWRITER today, toll-free.

Please specify printer and computer when ordering.

DOTWRITER	
(Models I, III)	\$79.95
DOTWRITER (Model 4)	99.95
Letterset Design System	39.95
Special: DOTWRITER and LDS	99.95
Additional Letterset disks (4-12 per disk)	17.95 and 24.95
Letterset Reference Catalog	10.00

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

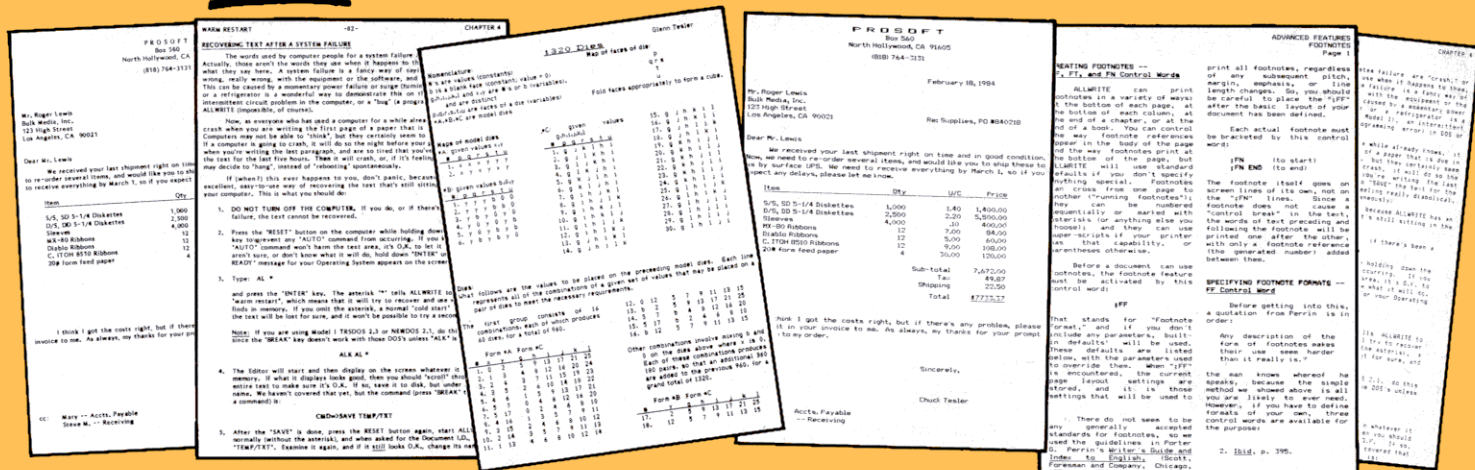
PROSOFT

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, \$15.00 overseas, sales tax in Ca. Most orders filled within one day.

ALLWRITE!

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



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 is based on the proven methods that made NEWSSCRIPT the most popular independently produced TRS-80 word processor, but it also has the speed and new features our customers have asked us for. 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 top 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...without annoying blinking or screen flicker. 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 will skip bad sectors, read the rest of the file,

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.

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

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.

NEWSSCRIPT's documentation was acclaimed in every review, and ALLWRITE's 350-page book is even better. 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 20 years, and understand the importance of good documentation.

To make installation easy, we include Tiny DOSPLUS for the Models I and III, and special, pre-tailored versions of both TRSDOS 6.2 and DOS-PLUS IV for the Model 4, all at no extra charge. The Model I and III versions work equally well with all major DOS's.

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. There is no time limit to our support: if you are our customer and you need help, just call or write. We give free updates for 90 days, and charge little or nothing for minor updates thereafter.

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.)

"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

"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, on-going 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.

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

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.

Attention NEWSSCRIPT Owners

You can trade in your copy of NEWSSCRIPT at very substantial savings. Please call our technical line for details.

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.

~~\$249.95~~ **\$199.95**

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.

Model 4 version available at Radio Shack: Cat. No. 90-0242

30

Fun and Games

Where have all the good times gone? While most of *80 Micro's* articles are helpful, my main interest is in computer games. You no longer publish two of my favorite columns, *Gamer's Cafe* and *Fun House*, and now it seems that most of your programs are in Assembly language rather than in Basic. Whatever happened to Richard Ramella?

Dave M. McCray
Glen Ellyn, IL

Hang on to your joystick—you'll see a couple of good Basic games soon. Also, check out Basic Takes to see what Richard is doing these days.

—Eds.

Basic Manager

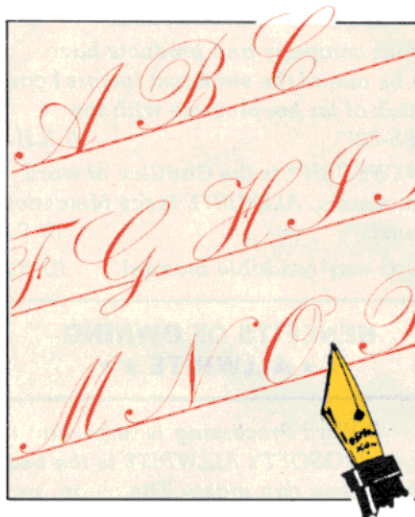
Wynne Keller's review of Basrum (November 1984, p. 190) is fair and accurate. Yet, Keller's difficulty in using the DOS debug utility to transfer Basrum from our distribution disk is misleading. This doesn't reflect a problem with Basrum or the transfer program, but rather is the result of an apparent misunderstanding of the proper Debug command. The documentation for our transfer program explains the correct debug command for TRSDOS users, cautioning other users to refer to their DOS manual for the correct command.

Richard Wiley
Wiley Inc.
Honolulu, HI

Floppy Repair

Vincent E. Meyer's "Drive Ways" (September 1984, p. 42) is informative and well-written. While it may cut down revenues for service centers, it eliminates a lot of frustration for computer users. I restored two erratic drives in under 20 minutes, saving myself close to \$80.

H.J. Porssa
Cincinnati, OH



Allwrite's OK

I share Terry Kepner's enthusiasm for Prosoft's Allwrite word processor (Reviews, November 1984, p. 35). It's immensely faster (and neater) than the old yellow legal pad, and almost as fast as dictating, but with the advantage of easy, unlimited editing.

As powerful as Allwrite is, the hardware limitations of the TRS-80's, particularly the 64-character by 16-line screen on the Model III and the RAM on both the Models III and 4, significantly limit the efficiency of word processing. Superior hardware is available with, for example, the IBM PC and its compatibles, for less than what I've spent on my Model III.

Allwrite is great, but the TRS-80 Models III and 4 are doomed.

Patrick B. Anderson
Issaquah, WA

I'm delighted with Allwrite, or at least the portion of it I've been able to decipher. Unfortunately, the manual, which is wordy and desultory, keeps me from making full use of Allwrite's capabilities.

Although Prosoft policy promises ongoing, unlimited support, they ignore my letters that request further clarification. This attitude certainly isn't compatible with stated policy,

and is especially unfortunate when you consider the high quality of the product at hand.

Reinaldo D. Verson
Miami, FL

Terry Kepner's review of Allwrite echoes my feelings exactly for Prosoft's latest program. It's probably the best word processor ever written for TRS-80 computers.

The manual, too, is "world-class"; it covers every facet of the program, complete with examples of each operation. Yet, Allwrite is so easy to use that you can produce standard business letters after reading only a few pages of the manual.

A.A. Wicks
Agoura, CA

Font'n'Blue

When Supreme reigns ET on 80,
And an El Clarendon leads droppity Dropcap, how in the name of heaven
Or hell do you fit the backslash in
Absence of font-Greek-&-Math?

This is a case of font'n'blue
For typesetter as well as editor
When the supplied-line-cxs are left unpasted and the typesetter's effort is
Plum wasted. The whole damn thing is
Clear-un-done, clear-un-done!!

Prem Gongaju
Peterborough, NH

Prem is one of 80's illustrious typesetters. It seems we asked him to insert a backslash character on an off day, when the muse was with him; ET and Clarendon are type fonts used in 80 Micro.

—Eds.

Send correspondence to Input, c/o 80 Micro, 80 Pine St., Peterborough, NH 03458.

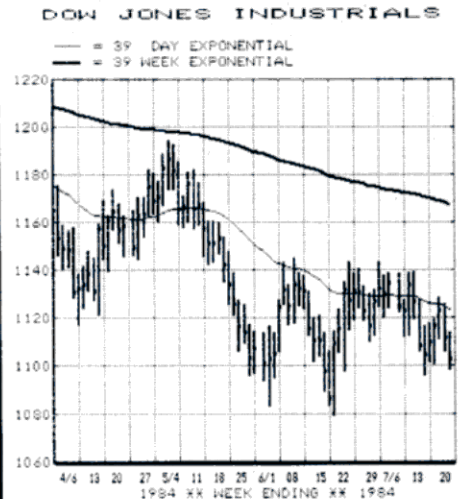
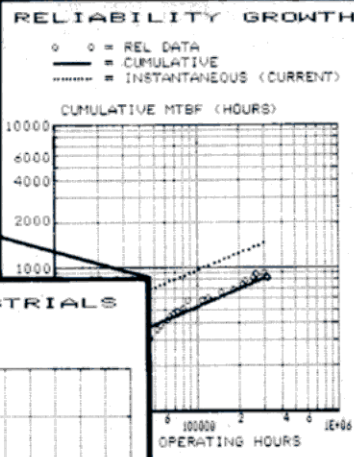
DATAGRAPHTM

PRINTER
GRAPHICS
PROGRAM

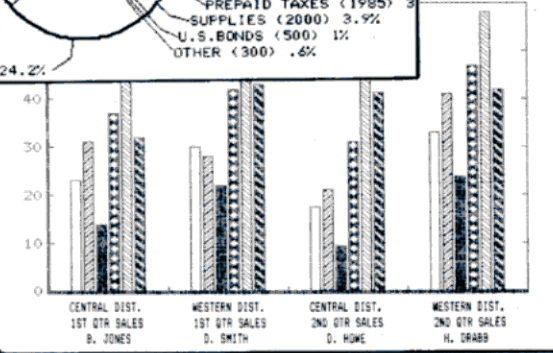
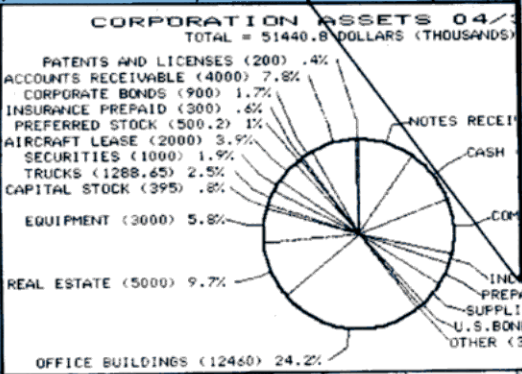
TRANSFORM YOUR VISICALCTM OR MULTIPLANTM FILES INTO HIGH-RESOLUTION
CUSTOM GRAPHS ON YOUR TRS-80TM COMPUTER AND GRAPHICS PRINTER.

ELECTRONIC WORKSHEET											
January	NYCI	DJA	DIT	DUI	SIP	500	Advances	Declines	Up Vol	Down Vol	Dr Vol
1231	77.86	963.77	376.10	114.42	135.76	1040	593	24,338	11,355		
122	78.26	972.78	421.43	115.12	136.34	1062	495	17,275	8,453		
105	79.30	992.55	456.77	117.81	137.97	1080	433	11,159	14,689		
104	79.14	1001.69	402.89	117.16	138.12	1047	440	38,463	23,709		
107	77.27	980.29	391.19	115.19	135.60	216	1550	29,968	85,844		
100	76.20	965.76	388.21	114.99	133.66	578	1020	11,757	39,975		
107	76.44	963.69	384.82	112.89	133.40	907	420	28,723	15,737		
112	76.52	968.77	388.34	112.85	133.52	928	433	25,813	19,192		
113	76.35	965.10	387.10	112.49	133.25	578	993	12,407	24,532		
114	76.55	966.47	389.55	112.38	133.47	914	412	23,382	13,775		
115	76.97	969.97	376.10	112.45	133.90	789	471	21,567	13,526		
116	77.33	973.29	401.98	113.22	134.77	680	642	23,222	14,425		
119	75.10	970.79	401.55	114.35	134.37	740	750	16,714	15,338		
120	75.21	956.68	394.89	113.80	131.80	371	1172	5,889			
121	75.39	944.25	372.46	113.80	131.36	547	554	15,737			
122	74.76	940.44	372.03	113.00	130.26	440	1062	11,057			
123	74.72	942.15	371.41	112.76	130.23	683	780	16,604			
126	74.45	938.01	367.19	111.47	129.84	564	562	11,694			
127	75.17	949.49	374.64	111.72	131.12	943	557	28,173			
128	74.79	942.50	375.43	112.49	130.34	686	763	17,433			
129	74.67	940.09	368.04	112.74	130.29	774	710	17,433			
130	74.27	947.27	402.22	112.82	129.53	727	775	16,777			

WORKSHEET			
DATE	NYSE Vol	100 NYCI	A-D
1231	41.21	77.25	447
102	28.87	77.47	567
105	29.71	77.78	873
106	67.40	78.99	409
107	92.89	77.89	133
108	55.35	77.59	450
109	50.19	77.30	289
112	48.76	77.23	295
113	45.99	77.07	415



NEW!
MODEL IV
VERSIONS FOR
MULTIPLAN
OR
VISICALC



* HIGH RESOLUTION - 60 x 72 data points/inch. * LARGE DATA CAPACITY - 1000 Input Data Points per graph. * SELECTABLE GRAPH SIZES - From 1" sq. to 7" x 24" * STANDARD DATA SOURCE - Plots Data from VISICALC or MULTIPLAN Spreadsheets using the DIFTM or SYLK Formats. * GRAPH FEATURE SELECTION - Fill out Pre-formatted worksheet form with VISICALC or MULTIPLAN Program. * MINIMAL ENTRY REQUIREMENTS - Enter only name of Datafile and location therein of data to be plotted. * MULTIPLE FUNCTION GRAPHS - Plots over 10 Data Sets per graph. * DATA SYMBOLS - Plots data with user composed symbol shapes. * DATA INTERPOLATION - Connects data points with user composed line shapes. * LINE/SYMBOL LIBRARIES - Plots data with 324 different Line/Symbol Shapes chosen from 27 line/symbol libraries. * CUSTOM LINES AND SYMBOLS - Has interactive screen-graphics program for composing symbol shapes. * AUTO SCALING - Selects scale values for ease of graph interpretation. * User adjustable Mantis Table. * SCALE SELECTION - Has Linear, or Log Scales with selectable pattern of grid lines. * CALENDAR SCALE - Optionally prints names of month on horizontal scale. * CURVE SELECTION - Can Mix Scatter, Line, Curve-Fit, Stairstep, Bargraphs, Pie Charts. * OPTIONAL MIN/MAX VALUES - Extends graph beyond the values of the Data Sets. * DATA SET DESCRIPTIONS - Prints text descriptions of each Data Set in graph legend. * TEXT ENTRIES - Prints graph title, axis labels, and date on graph. * USER FRIENDLY - Checks validity of input data and displays cause of errors. * COMPLETE DOCUMENTATION - Comprehensive 100 page Users Manual with examples covering data preparation, graph feature entry, composing lines and symbols, and technical notes.

MODEL I, III, IV
\$79.95
PIE CHART OPTION:
\$34.95
MODEL II/12/16
\$129.95*

*INCLUDES PIE CHARTS
USER REQUIREMENTS

- | | |
|--|---|
| COMPUTER
• TRS-80 MODEL I, III 48K
• TRS-80 MODEL IV 64K
• TRS-80 MODEL II, 12, 16
SPREADSHEET PROGRAM
• VISICALC
• MULTIPLAN (MODEL IV)
DOS
• TRSDOS 1.3, 2.3, 2.0, 4.2, 6.1.2
• NEWDOS, DOSPLUS, LDOS
DISK DRIVES • DUAL | GRAPHICS PRINTER:
• MX-80 GRAFTRAX, OR GT+
• MX-100, FX, RX 80/100
• LP VIII, DMP 120-500, 2100
• NEC 8023 A-C, C.I.TOH 8510
• IDS 460/560, 480, 80/132
• OKIDATA 82/83, 92/93, 84
• GEMINI 10X/15X |
|--|---|

TO ORDER: Send purchase order, check, or COD request. Specify Computer, Spreadsheet Program, and Printer Type. Include \$2.50 for postage and handling. Calif. residents add 6% tax.

MICRO SOFTWARE SYSTEMS • MICROPLOT, INC.

DEALER
INQUIRIES
WELCOME

1815 SMOKEWOOD AVE. • FULLERTON, CA 92631 • (714) 526-8435

TRADEMARKS: DATAGRAPH (MICRO SOFTWARE SYSTEMS); VISICALC (VISICORP); TRS-80 (TANDY CORP); DIF (SOFTWARE ARTS INC.); MULTIPLAN (MICROSOFT CORP)

VISA/MASTERCARD
ACCEPTED



LET'S KISS 1 MILLION **MUTE** TRS-80's GOODBYE.

**NEW
MODEL 4
VERSION !**
VS-100
Voice Synthesizers.

SEE REVIEW IN
DECEMBER 80 MICRO



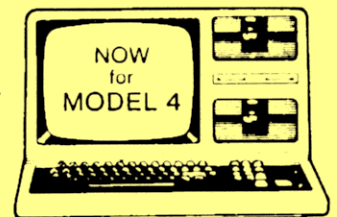
TALKER 4.0 Text to Speech Software

Includes all the features of TALKER 1.4 and TALKER 2.0 (see next page) and:

Full Model 4 support, in Model 4 and III modes!

Including these powerful features:

- ☐ Automatic keyboard echo (letter by letter or word by word, with or without punctuation).
- ☐ Automatic screen echo
- ☐ Pitch and speed control
- ☐ Speech is as easy as: PRINT★ "I'll say anything"
- ☐ Relocates itself into high memory (uses only 6¼K)



TALKER 4.0 on disk only (also includes TALKER 2.0 for use in model III mode)..... \$39.95

"Doctor SIGMUND" will amaze you

See Artificial Intelligence working!



If you want to show off your computer, run "Doctor SIGMUND" and see their expressions as your TRS-80 has an intelligent conversation with you.

If you have our VS-100 voice synthesizer, Sigmund actually talks back to you. Even YOU will be impressed.

Doctor SIGMUND, for Models I, III and 4 (48K required). Available on disk only.....\$29.95



ALPHA Products

79-04 Jamaica Ave., Woodhaven, NY 11421

800-221-0916

9 AM to 5 PM E.S.T.

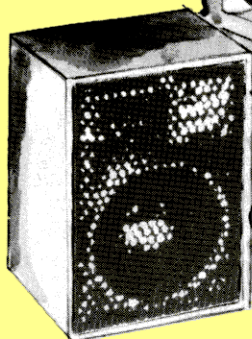
In NY call: (718) 296-5916.

GIVE YOUR COMPUTER A


VOICE

As Well as a Mind

VS-100
VOICE
SYNTHESIZER
FOR RADIO SHACK MODELS
I, III, 4P and Color Computer



Introducing
the "No Compromise"
Voice Synthesizer at a
price that speaks for itself!
Price includes synthesizer, module,
power supply, 40 page manual,
editing and demo software.

Call our "NEW" Demo Hot-Line
 212 296-0399
And hear it for yourself!

VS 100
\$ 69⁹⁵

Speaker not included,
add \$5.95

Text to Speech software:

- Talker 1.4.....\$19.95
- Talker 2.0.....\$29.95

An Impressive List of Features:

- Unlimited vocabulary.
- Automatic inflection.
- Proven VOTRAX technology.
- We use the famous VOTRAX SC01 phoneme synthesizer.
4 programable pitch level.
- Built in audio amplifier with volume control.
- You can add voice to any basic program in minutes.
- Super efficient: one single line in Basic will produce a full sentence!
- Works with any speaker (or add \$5.95 for handsome speaker module).
- Price breakthrough: same performance as units costing hundreds of dollars.
- Voice editor will help you create unlimited number of words, sound effects, etc.
- Hundreds of applications—now cost effective in education, robotics, speech therapy, monitoring, games, aid to handicapped, security, prompting...
- Fully assembled and tested.
- Ready to plug in and talk.
- Plugs into 50 pin I/O bus on Model 3
- As usual our 15-day money back guarantee protects you

Text to Speech Software for the VS-100

TALKER 1.4

- ✓ Unlimited vocabulary translation of English text to speech
- ✓ Very easy to use: In BASIC simply type PRINT "I talk"
- ✓ Reads numbers up to 999 trillion
- ✓ Reads many abbreviations correctly (such as Mrs., Mr., lb., Co., etc.)
- ✓ Very fast machine language program is only 4.5K long
- ✓ Loads in high memory

Only \$19.95. Specify disk or tape

TALKER 2.0

- ✓ Same features as TALKER 1.4 plus:
- ✓ Automatic keyboard echo option
- ✓ Automatic video display echo option
- ✓ Punctuation pronunciation if desired
- ✓ And many control codes for increased versatility
- ✓ Self relocatable program is only 6¼K long
- ✓ New BASIC command: PRINT! prints and talks.

\$29.95. On disk only

NEW!

 **ALPHA Products**

79-04 Jamaica Ave., Woodhaven, NY 11421

✓17

(718) 296-5916

Toll Free Order Line

800-221-0916

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

Hours: 9-5 Eastern Standard Time

Add \$3.00 Per Order For Shipping
And Handling. We Accept Visa.
Mastercard, Checks, M.O. C.O.D.
Add Sales Tax. Overseas, FPO
APO: Add 10% Dealer Discounts
Available C.O.D. add \$3.00 extra.

Send any questions or problems dealing with any area of TRS-80 microcomputing to Feedback Loop, 80 Micro, 80 Pine St., Peterborough, NH 03458.

Q: I've recently had trouble backing up disks on my dual-drive Model III. I follow the prompts as I always have, answering no to the reformat prompt. After the reading and verifying procedure starts, the computer gets stuck. A few moments later, input/output error and lost data messages appear on the screen.

I've done everything possible to avoid outside interference, and I've had the drive heads realigned. None of this helped. I've tried backing up the same disks on other computers and there wasn't any problem. Do you have any suggestions? (Jon Handel, Los Angeles, CA)

A: The problem could be your DOS. The back-up utility or the DOS itself could be damaged and the machine-code instructions flawed. An easy and quick test is to use the DOS on another computer and see if the problem disappears. If it does, the problem is not the DOS or the back-up utility.

The next possibility is that your destination disks may be at fault. I'd suggest answering yes to the reformat prompt. It's possible that one of the disk sector header bytes is slightly damaged, causing the DOS to reject the destination disk. By the way, when was the last time you had the drive heads cleaned?

Q: After buying two double-sided disk drives capable of running 40 or 80 tracks, I found out that TRSDOS 1.3 doesn't support two-sided disk reads or 80-track formats. Do you know of a patch to the DOS to correct this? If I have to buy a new DOS, which is best for this purpose? I don't need any other fancy features,



nor do I want to spend a lot of money.

On another subject, is there a program to move the calls on my machine-language software to high memory on my Model III? (Chris Candreva, Rye, NY)

A: Patching TRSDOS for double-sided 80-track drives isn't easy, and I don't know of any companies selling such patches, but I've been told that several people have done it. Can anyone help?

NEWDOS80 (Apparat Inc., 4401 S. Tamarac Parkway, Denver, CO 80237), DOSPLUS (Micro Software Systems, 4301-18 Oak Circle, Boca Raton, FL 33431), LDOS (Logical Systems Inc., 8970 N. 55th St., P.O. Box 23956, Milwaukee, WI 53223), and MULTIDOS (Cosmopolitan Electronics Corp., P.O. Box 234, Plymouth, MI 48170) all support 35-, 40-, and 80-track, single- and double-density, and single- and double-sided drive operation. If your controller can handle them, NEWDOS80, DOSPLUS, and LDOS also support 8-inch drives.

LDOS is currently the least expensive operating system at \$69. MULTIDOS (\$99) is the easiest to use as it conforms the most to standard TRSDOS 1.3 syntax.

You won't find a program to move addresses. The problem is that many jumps are to absolute addresses, such

as subroutines and messages to the operator. Some programs also contain jumps to ROM and low-memory areas. The only way I know of to move addresses is to disassemble the target program, manually change the addresses, and reassemble the program to the new location. Any other suggestions?

Q: I'd like to use Larry Hamilton's book inventory program in the November 1982 *80 Micro* ("Homebrew Librarian," p. 436), but it's for a Model I cassette system and I own a Model III with two disk drives. What would I need to change to store my data on disk? (David E. Myers, Childress, TX)

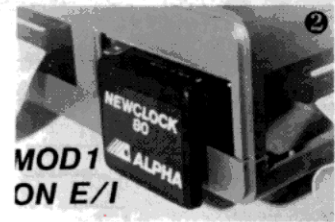
A: First, replace line 670 with a prompt for the data's file name, and add an Open command for the input statement immediately afterward. Change the INPUT#-1 statement in line 690 to INPUT#1. Then, add CLOSE#1 to the beginning of line 750. Now put a file name prompt in line 900, immediately followed by an Open command for the output statement. Change the PRINT#-1 statement in line 940 to PRINT#1. Add CLOSE#1 to line 970 and change "File copied to tape" to read "File copied to disk".

That should do it, but a straight conversion like this tends to waste space on your disk. For a better conversion, change the INPUT statement to LINEINPUT, and remove the commas as data field separators, using CHR\$(13) and semicolons instead. This compresses the data as much as possible on the disk and also lets you use commas inside the field items. Good luck.

Q: I've never seen an article about using 4164 chips in place of the 4116s common in the Model I. The 4164 appears to have the same pin layout with a few exceptions (see the

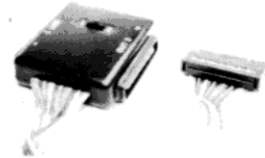
Newclock-80 \$69.95

The right time at the right price! Keep the time and date with quartz accuracy, even when your computer is off. The backup lithium battery (included) will last for over 2 years. Software on tape or disk, please specify. Use "TIMES" 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: plugs into the 50-pin I/O bus. Compatible with all operating systems.



Printswitch \$59.00

Do you have 2 printers? Get a Printswitch. Stop plugging and unplugging those printer cables. With the Printswitch, you can have 2 printers connected to your computer and you can select either one at the flick of a switch. Works with any printer, plotter, or device that uses the parallel printer port. Simply plug the 14 inch Printswitch cable into your computer, and plug your existing printer cables into the Printswitch. This is the nicest unit on the market. Superior quality board with gold plated edge connectors. For Models I, III, 4 and 4P.



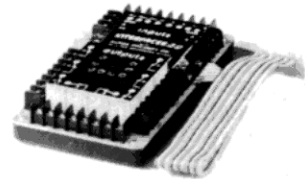
Alpha Joystick \$27.95

When it's time for fun, don't be without your Alpha Joystick. Do you know that most action games are joystick compatible? Stop pounding on your keyboard and enjoy real arcade control. The joystick can also be used with BASIC programs; simply do J=INP(0) to read the joystick position (8 directions and fire button). Model I: plugs into keyboard or expansion interface. Model III, 4 and 4P: plugs into 50-pin I/O bus. The Alpha Joystick comes fully assembled and tested, ready to plug in and enjoy. (Specify Model I, or Model III, 4).



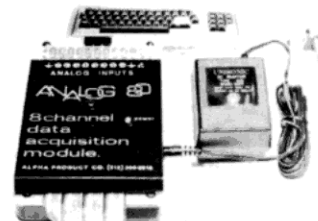
Interfacer-80 \$159.00

Low cost input and output device. The outputs consist of 8 relays (rated 2 Amp @125V), easily controlled using "OUT" commands. For example, OUT 0,0 turns all the relays off. Eight LED's show the states of the relays. The 8 inputs are optically isolated, so it's safe and easy to connect external devices (switches, sensors, thermostats, etc.). Simple "INP" commands read the inputs. Connection: Mod I: 40 pin bus. Mod III, 4, 4P: requires 50-pin I/O bus converter (\$39.95), plugs into 50-pin I/O bus. Comes complete with power supply, cable, and detailed manual. (Up to 8 interfacers can be connected to your TRS-80 using our Y- cables).



Analog-80 \$139.00

8 channel 8 bit Analog to Digital converter. Your TRS-80 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 8 Analog-80's can be connected to your TRS-80 for a total of 64 channels! Connection: Model I: 40 pin I/O bus. Model III, 4, 4P: requires 50-pin bus adapter (\$39.95). Comes complete with power supply, cable, and manual.



Special Cables

Disk drive extender cable (8'')...C160:\$9.95

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

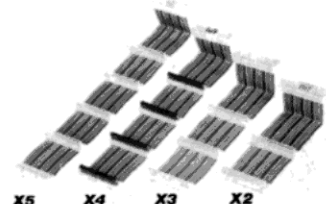
Disk drive cable (34 pin): •2-drive...C162:\$32 •4-drive...C163:\$45

Extension cable, 4 foot: •For printer and drive (34-pin)...C165:\$22

•For Mod I bus (40-pin)...C167:\$24 •For Mod 3 & 4 bus (50-pin)...C169:\$28

Keyboard to E/I (40-pin, 8'')...C161:\$21 If this is confusing, send for our Cable Flyer.

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



NO RISK

We know that ordering by mail can sometimes be a hassle, but with Alpha, you are fully protected.

- 1) Our 15 day money back guarantee protects you from disappointment.
- 2) All our products are tested on a TRS-80 and warranted to 90 days (parts & labor)
- 3) We ship 90% of our orders within 24 hours.
- 4) We are committed to help you

Green Screen \$12.50

Do you eyes a favor, put on a green screen. Tens of thousands are in use for a good reason: 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)



ALPHA Products

79-04 Jamaica Ave., Woodhaven, NY 11421 (718) 296-5916

Toll Free Order Line

800-221-0916

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

Hours: 9-5 Eastern Standard Time

Add \$3.00 Per Order For Shipping And Handling. We Accept Visa, Mastercard, Checks, M.O. C.O.D. Add Sales Tax. Overseas, FPO APO: Add 10% Dealer Discounts Available C.O.D. add \$3.00 extra.

4116	4164
1	?
2 & 14 shorted on both	
WR	R/W
4 RAS	4 RAS
8 + 5v	?
9 + 12v	9 A7
10 to 12 A5, 4, 73 on both	
13 CE/A6	13 A6
15 CAS on both	
16 Gnd	?

Table. Pin layouts of 4116 and 4164 chips.

Table). It seems that some judicious trace cutting would be a good start. Would this change (and one or two others) be effective in increasing memory capability? (C.G. McProud, Lehigh Acres, FL)

A: Yes, it's possible to convert 4116 sockets to 4164s, but I don't have the technical knowledge to tell you what to do. Does anyone know how to do this modification?

Q: I'm trying to track down the address of a company called Progressive Computer Products. Apparently, they made floppy drive controller boards for the Model III. I'd appreciate any clue you might offer about the company's whereabouts. (Brian W. Voth, Urbana, IL)

A: Sorry, Progressive Computer Products seems to have gone out of business, but I found another company, Progressive Electronics, that sells a Model III floppy disk controller board that handles both 5 1/4-inch and 8-inch drives. The controller retails for \$149. Their address is 504 E. Main St., Lancaster, OH 43130, and the phone number is 614-687-1019.

Q: I own a cassette-based Level II Model I. I want to upgrade its graphics capability. I'm particularly interested in Micro Control Systems' CHROMAtr. It increases graphics resolution to 256 by 192 pixels in color. I know of the company only through an old magazine and don't know if they're still around. If not, what about other color or black-and-white graphics expansions for the Model I? (Craig L. Cole, Circleville, NY)

A: Unfortunately, Micro Control Systems is no longer in

business, and I don't know of any other companies that make color boards for the Model I. Does anyone else know of any color or black-and-white graphics expansion boards?

Q: I have some questions regarding Langley-St. Clair's replacement monitors. I have a Model III with Radio Shack's hi-resolution graphics board. Can the replacement monitors handle 640- by 240-pixel resolution? Also, what is the dot pitch of these monitors? What is fast, medium, and slow decay and how does it affect the way the monitor performs? (W.R., Waukegan, IL)

A: The replacement monitors are almost identical to your computer's original monitor. If the original can handle the higher-density graphics, then so can the Langley-St. Clair monitors. I have no idea what you mean by dot pitch (and neither did the Langley-St. Clair technician I asked about it), since the dots are supposed to be perfectly round and flat against the glass screen.

The fast, medium, and slow ratings given to CRTs are relative terms because the phosphor doesn't instantly turn on and off. Instead, when the electron beam hits it, the phosphor flares quite brightly, then diminishes in brightness along a logarithmic scale (fast at first, slower toward the end). The fast phosphor monitors (type P4 is black and white, type P31 is green) have a glow time of .0024 seconds. The P31 is slightly slower than the P4 tube, varying from .0024-.01 glow times, depending on the exact chemical composition of the tube, but it still spends more time off than on.

The medium-amber tubes, P134s, have a glow time of .003 seconds or more. While this is longer than the P4 tubes, it isn't as long as some P31s.

The slow green monitors (P39s and P42s) have a glow time of .33 seconds, lasting until the next scan strobe arrives.

For most people, the P31 green screens or P134 amber screens seem to be the best choices. The fast phosphor green screen doesn't seem to be as harsh on your eyes as normal black-and-white monitors, and some people prefer the green to the amber.

Q: I think you missed the reason for D.M.W.'s problems with

the USR command (September 1984, p. 16). Several of my readers have written with similar experiences (error message and exits to DOS), so many, in fact, that I've sometimes considered printing up a form letter reply.

Under any Model I/III DOS, Basic uses the top 256 bytes of available memory as a loading buffer. Even if you enter a memory size on the Basic command line (for example, -M:xxx-xx) or at the memory size prompt, it's already too late to protect machine-language routines stored at the top of memory. They've been overwritten and are gone.

The solution is to set high memory before invoking Basic (with the TRSDOS 1.3's Clear command, for example), load the routines after entering Basic, or write the routines so that they're self-relocating and self-protecting.

To add confusion (and it took a while for Jim Kyle of the Software Factory to find the reason for this bug and a solution for it), TRSDOS 1.3's Do command ignores the current high memory value completely. If you load and protect a machine-language routine and then enter Basic with a Do Command, a seemingly easy way to perform several necessary steps, the high-memory routines will still be garbled. (Hardin Brothers, Up-land, CA)

A: Thank you for sharing your discoveries. I didn't realize Basic used those bytes during loading.

Q: I've heard that somewhere in this world there exists a speed-up chip that gives the Epson MX-80 a printing speed of more than 80 characters per second. Know anything about it? (Bernadette M. Kennelly, Pittsburgh, PA)

A: That's a new one for me. Can anyone help out?

Q: I have an LNW-80 computer and a Diablo 1620 serial printer that uses ETX/ACK protocol. I want to run the printer at 1,200 baud through the RS-232 interface. I've been unable to get a serial driver that will handle the ETX/ACK protocol. I've contacted LNW and Xerox to no avail. If someone who has a driver is willing to share, I'd be very grateful. I'm also willing to pay for a program

or to pay someone to write one.
(Robert J. Aubrey, Massena, IA)

A: Suggestions, anyone?

Q: I bought an RX-80 printer and it's great, but it doesn't have block graphics. I've tried unsuccessfully to work with the RX's bit graphics. I'm hoping that one of your readers, better versed in Basic than I, may have worked up an RX screen dump for graphics as well as text. (James Criscimagna, Leesburg, FL)

A: Does anyone have a graphics screen-dump program they wouldn't mind sharing with Jim?

Q: I'm considering buying a Model 4 for word processing, but I've found a major flaw in SuperScript. I'm writing a dissertation and must know where page breaks fall so I can position footnotes. I formatted a document for double line spacing and then changed an entire paragraph to single spacing. As I moved the cursor through the text, the line-spacing indicator changed from 2 to 1 and back to 2, but the line counter continued to be incremented by twos, and the top-of-page feature showed me the same "next page" as it had when the entire page was double-spaced.

Do you know of a patch to correct the problem? If not, do you know of an alternative word processor that shows page breaks correctly in the Editor mode? (Duff Kennedy, Santa Barbara, CA)

A: I don't know of any patches to SuperScript that do what you want. Does anyone else? Nor do I know of another Model 4 word processor that gives you page-break information. However, Allwrite (ProSoft, Box 560, N. Hollywood, CA 91603) lets you type footnotes immediately after the word, phrase, or sentence they reference, then automatically makes room for them when printing the page.

Q: M.J. Mockler asked about an overflow error encountered while attempting to POKE a machine-language routine into core locations 32752-32767 using a For...Next loop. M. J. was able to correct the problem by looping from 32751-

32767 and computing the POKE address as the loop variable plus 1, but didn't understand why that worked. I think your response overlooked the problem's most likely cause.

In a For...Next loop, the loop variable increments when Basic encounters the Next statement and compares the result to the upper limit. If it exceeds the limit, the loop terminates; otherwise it repeats. If you define the loop variable as an integer in a DEFINT statement and subsequently use it in a loop with an upper limit of 32767, the Next statement tries to increment the integer 32767 the last time through the loop, producing an overflow. The fact that a POKE is executed within the loop is irrelevant.

Based on this explanation, it's likely that changing the loop limits would remedy the problem. Another way is to use a single-precision variable to control the loop. The same For...Next loop would work fine if the loop variable weren't defined as an integer. Perhaps this was the case in the reader's other program, which ran without error. (Robert W. Miller, Stow, MA)

A: You're right, that is the explanation. Don't know why it didn't occur to me.

Q: I have a Model 4 and use cassette Scriptit 3.1 for word processing. Do you know why the program crashes about one time out of 20 or 30 when I save copy to tape? I don't think it's my machine, because a friend's Model III does the same thing using a different copy of the same program. (James Merlini, Montgomery AL)

A: Since it's an intermittent problem or the computer is at fault. It could be that power line fluctuations (refrigerator, air conditioning, and so on) send voltage spikes through the equipment and foul things up. The only practical solution is to use a scratch tape for periodic file saves while writing so you won't lose too much of the file in the event of a crash.

Q: I'm trying to connect my Model 4P to an IBM mainframe host. I use a protocol converter to make the micro's asynchronous com-

munications protocol compatible with the mainframe's bisynchronous communication. However, the protocol converter requires that the micro emulate one of the following terminals: DEC VT-100, IBM 3101, Televideo 910, Adds Viewpoint, or Lear-Siegler ADM-3A/5. I can't find a Model 4P communications program that provides any of these terminal emulations. Do you know of one? (Dick Moore, Wilmington, DE)

A: I know of only one: Logical Systems' LS-HOST/TERM, which uses TRSDOS 6.X.X as its operating system and operates as an ADDS-25 terminal emulator. It costs \$199.

Q: I have a 48K Model I with a single drive operating under TRSDOS 2.3. I also have a data disk full of machine-language programs. To run the programs, I have to copy them to a disk that has the DOS on it, or copy the DOS to the data disk. I can't copy with one disk drive; the Backup utility will reformat the disk with the DOS on it. I've seen single-drive copy programs in 80 Micro, but they require a DOS to open the files to be copied. ARRGH!

Also, do you know of a way to modify Radio Shack's cheap color mouse to work on my Model I? (Joseph W. Howard, Cleveland, OH)

A: The two possible solutions to your dilemma are to get a single-drive copy utility or get a DOS that will let you make single-drive copies. The best copy utility is Super Utility Plus (Powersoft, 11500 Stemmons Freeway, Suite 125, Dallas, TX, 75229). It also lets you copy a file, or group of files from one disk to another without losing a byte or requiring a DOS on either disk.

As for the non-Tandy DOSes, NEWDOS80, DOSPLUS, LDOS, and MULTIDOS, all of them support single-drive file copying. See my answer to Chris Candreva's letter above for manufacturers' names and addresses. ■

Terry Kepner is a freelance writer and programmer, and an associate editor of 80 Micro. He's been writing about microcomputers since 1979.

**Model 4
Producer Version
Now Available**



The **PRODUCER**

The Professional Program Writer.

YOU CAN MULTIPLY YOUR PRODUCTIVITY WITH THIS SENSATIONAL SOFTWARE BREAKTHROUGH

Beginners can now program with no experience necessary.
Professional programmers now have a tool to save days and weeks of time.

THE PRODUCER WRITES CUSTOM PROGRAMS FOR YOU!

Why buy expensive Data Base programs that are only half effective and require the original Data Base system disk to run the finished program? The Producer is a Program Generator that can create the exact programs you want.

You don't need any previous programming experience since The Producer writes all the code for you. And when the program is finished, it runs without the support of the original Producer system disk.

What Kind of Programs Can The Producer Write?

With the Producer you can create impressive, sophisticated and functional software to manage your data. The only limit is your imagination. You can quickly and easily create programs to manage such things as mail lists, personnel records, inventory control, library catalogs, loan calculations, personal finances, and maintenance schedules.

You may never again need to buy a canned program to perform a needed task related to data storage and retrieval. The Producer can write all those programs for you, including the capacity to do all standard calculations and to generate both on-screen and printed reports. The freeform report generator even allows you to design reports on your preprinted forms.

How Does The Producer Work?

The Producer itself is a sophisticated program based on years of research and development. But The Producer was written with the end user in mind and the program generation process is quite simple.

You can begin by using a planning form designed to help you organize your program ideas. The Producer then asks you a series of simple English questions to enable those ideas to be translated into a program format. You use the computer's arrow keys and graphic characters to draw the data entry screen just the way you want it.

Then with the press of a button, the program generator takes over and does all that complex coding for you in a matter of minutes. The result is a complete program, capable of running by itself. That means your customized programs may be used independently of The Producer. (A feature not possible with Data Base creations.) You may duplicate your Producer generated programs and even sell them for others to use, without paying royalties.

How Difficult Is The Producer Process to Learn?

The Producer software package makes learning simple. An easy to follow tutorial takes you through each step of The Producer process as you sit at the computer. (This includes audio cassette tapes with the Model I/III versions.) This hands-on experience not only teaches you the process but allows you to create a program of your own design while you learn. The tutorial is all you need to get started.

Later, if you have need for more specific information, you can turn to the fully indexed Producer Reference Manual. The 200 pages of documentation cover virtually any question you may have so you will never be left guessing what to do next. The Producer package also includes a quick reference card to streamline your program operation and, should you ever need technical assistance, you may call a Producer Software technician for free counsel and trouble shooting.

Is It True That I Can Both Create and Edit At Will With The Producer?

Yes! Unlike most other program generators, The Producer gives you complete freedom to design the screen any way you wish. Experiment, rearrange, "cut and paste" between trial screens. That's the kind of versatility you get. And even after your program is complete, you can change your mind. With The Producer you can edit and refine finished programs without starting over. That's a real time saving.

What Are Some Other Outstanding Features Of The Producer?

- Our B-Tree file structure gives extremely fast access to data, allows global search and replace, data entry by batch mode and automatic file rebuilding.
- The Screen Generator is the best anywhere at any price and gives full screen control including graphics. You can add, insert, or delete, and move blocks of text on screen and between screens.
- All math calculations are supported including subtotals and global recalculations.
- The Freeform Report Generator gives you an amazing versatility to design text placement, interfield calculations, and formats. You can even print reports on your standard forms.
- The Producer package also includes a free Home Inventory program and a one year subscription to The Producer Newsletter.

The Producer \$199.95

**Available now for TRS-80
Models I, III, IV**

Ask about DATA SHUFFLER,
New Sort/Merge Program \$34.95

Order toll free:

1-800-433-5355

Texas 817 274-6998



And Baby Makes Three: The Tandy 200

Introducing new computers is getting to be a habit with the people at Tandy. The debut of the Tandy 200 last month marks Tandy's third computer unveiling since September 1984.

The 200, priced at \$999, is Tandy's long-awaited enhanced version of the Model 100 briefcase computer (see Photo 1). Its firmware features MS-Plan, a full-function, 63-column by 99-row version of Microsoft's Multiplan spreadsheet, and an improved text processor that provides better page formatting. The screen is a 40-column by 16-row liquid crystal display. Standard RAM is 24K, and expansion ports support two additional 24K memory banks.

Other enhancements include optional NiCad battery operation, an improved cursor key cluster at the keyboard's top right-hand corner, and a calculator function. The text program now has a list function that performs string searches in .DO files.

The 200 has the same ROM-based software and menu screen as the Model 100, along with a bar code reader port and an internal 300-baud modem. The expansion bus, awkwardly positioned on the bottom of the Model 100, is on the back of the 200, next to the parallel printer port. Users of Radio Shack's disk/video interface or other portable disk drives will appreciate the change.

The new computer is wider and perhaps a half inch thicker than the 100 to provide room for the new hardware.

That's the good news. The not-so-good news is that the 200 isn't 100 percent compatible with its predecessor. Radio Shack's Director of Market Planning, Ed Juge, told *80 Micro* that

edited by Bradford N. Dixon

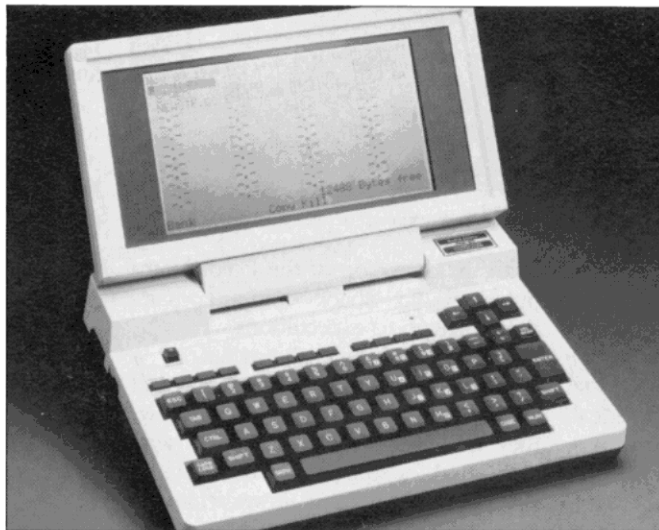


Photo 1. The Tandy 200.

Tandy aimed for 100 percent compatibility but didn't quite achieve it. The 200 runs Model 100 programs only if they're straight Basic, without any PEEKs, POKEs, or USR statements. Machine-language Model 100 programs probably won't work either, because the new machine's addresses are different from the 100's.

When *80 Micro* asked Juge if Tandy expected to discontinue the Model 100, he said the company had no immediate plans to do so, so long as the older portable continues to sell and be profitable.

The Tandy 200 may not be the super portable featuring a disk drive, MS-DOS, and 256K of RAM that some Tandy watchers hoped for, but it does follow Tandy's winning formula of low price, performance, and ease of use. And that may be all it needs to find acceptance in the marketplace.

Tandyland

Industry analysts' reaction to Tandy's fall 1984 introduction of its 1200 HD

computer was lukewarm. Ken Churilla of San Jose-based Creative Strategies thinks marketing the IBM PC/XT-compatible will be a "real challenge" because of Tandy's traditional association with low-end, small-business users.

Lloyd Cohen of International Data Corp. in Framingham, MA, thinks Tandy may have hitched its wagon to a falling star. Cohen predicts PC/XT sales will drop because of IBM's introduction of the PC/AT. He argues that the 1200 won't attract prospective corporate buyers because they'll get service discounts for adding PC/

ATs to their PC fleets and won't care that the 1200 HD is \$1,000 cheaper.

When the same experts were asked if the 1200 would affect sales of Tandy's Model 2000, most followed Tandy's logic by noting the performance differences between the two machines. As Barbara Isgur, a securities analyst with Paine Webber Mitchel Hutchins Inc., put it, the 1200 won't cannibalize sales of the Tandy 2000 because "people will appreciate the faster speed and better display" of the 2000.

Rumors about mass storage for Radio Shack's Model 100 shifted focus from floppy disks to wafers last fall, after Entrepo president Bob MacDonald said his company was working on a wafer storage system for Tandy.

When *80 Micro* asked Radio Shack's Model 100 line manager Stewart Weinstock about a wafer drive from Entrepo, Weinstock said he had no knowledge of such a project. Weinstock said wafer systems offered some solid advantages such as low power consumption, light weight, and small

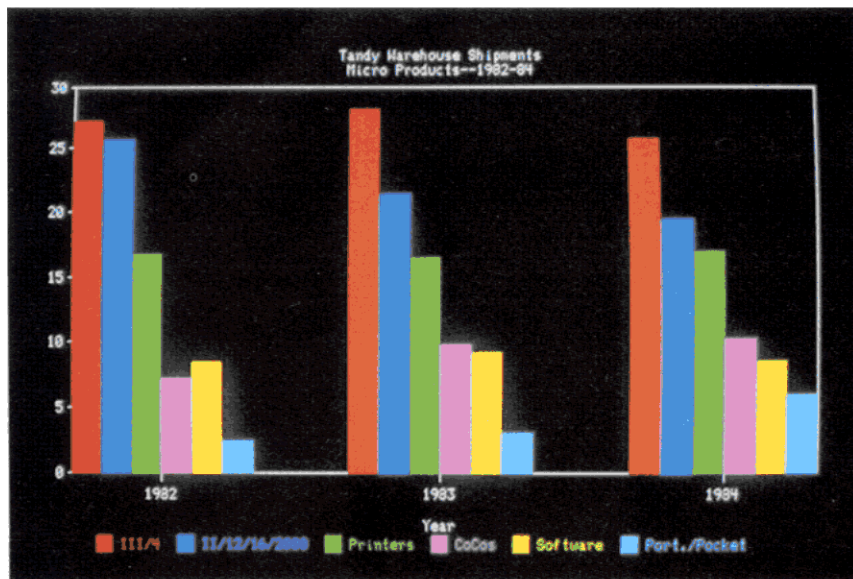


Photo 2. Tandy's fiscal 1984 warehouse shipments.

size, but that in the past, they've exhibited a read/write accuracy problem.

Weinstock did mention, however, that he was looking for another Model 100 mass storage device similar to the present disk/video interface. The ideal unit would be a bit more portable, use both ac and battery power, and support video capability. Weinstock went on to say that although the technology for the product was under research, no such product could be expected until late in the first quarter of 1985.

You see plenty of Model 100s on Eastern Airlines' New York shuttle, so why not on the space shuttle? The space shuttle Challenger's October 1984 mission included experiments measuring the earth's atmosphere using Radio Shack's briefcase computer.

Canadian astronaut Marc Garneau used the 100 with a sunphotometer to measure solar radiation and the effects of volcanic haze on earth's atmosphere. Garneau linked the sunphotometer to the Model 100 via a cable connected to the computer's RS-232C port. Periodically, he downloaded data from the sunphotometer to cassette tape for storage.

NASA tested the Model 100 for electromagnetic and toxic gas emissions before approving it as the second portable computer qualified for space shuttle missions; the GRiD Compass was the first portable to make a shuttle trip.

Tandy's 1984 annual report had some disappointing news for stockholders:

With the exception of the Color Computer, Radio Shack computer sales didn't live up to expectations.

Using warehouse shipments as a measure, Tandy said that not only did computer product sales fail to grow, they declined. Computer-related sales accounted for 33.6 percent of all Tandy shipments, 1 percent lower than in fiscal 1983. Tandy blames a variety of factors for the drop, including increased competition, price reductions, delays in product introductions, and semiconductor shortages.

The Models III and 4 accounted for 25.8 percent of Tandy's computer-related shipments, followed by the Model II/12/16/2000 lines with 19.4 percent. Radio Shack's Color Computer line was third with 10.3 percent, while portable and pocket computers chalked up only 6 percent. Printers, software, and miscellaneous products made up the remaining 48.8 percent (see the Fig. and Photo 2).

MicroTrends

What's with home computer users?

According to Tricia Parks of Future Computing, 16 percent of all U.S. households will have computers by the end of 1985. The Dallas-based research company has come out with a report profiling home users and detailing what models they own, what they like and dislike about their systems, and what they use them for.

The report, called "Consumers and Computers 84," costs \$12,000, but you

can guess at its findings in this Pulse Train quiz. Answer true or false to each statement below:

1. Home computer owners look for ease of use, then for other product features.
2. Home computer owners are more satisfied with productivity applications than with other types of software.
3. The typical home computer owner is dissatisfied with her product.
4. Owners of high-end home computers and owners of low-end home computers read the same magazines.
5. After the novelty wears off, most home computers end up in the closet and are rarely used.

According to the report, the answer to each statement is false.

Future Computing broke down home computer owners into three groups: the home group, the straddlers, and the office/home group. Those in the home group usually own under-\$600 systems with 64K or less of RAM like Commodores, Ataris, or Radio Shack Color Computers. The home group is most interested in computer literacy, personal enrichment, child education, and games.

Straddlers typically own an Apple II, a TRS-80, or a PCjr with 64-128K of RAM, and they spend about \$1,650 on their initial computer purchase. Home computerists in this group prefer home and business management, word processing, personal enrichment, and child education applications.

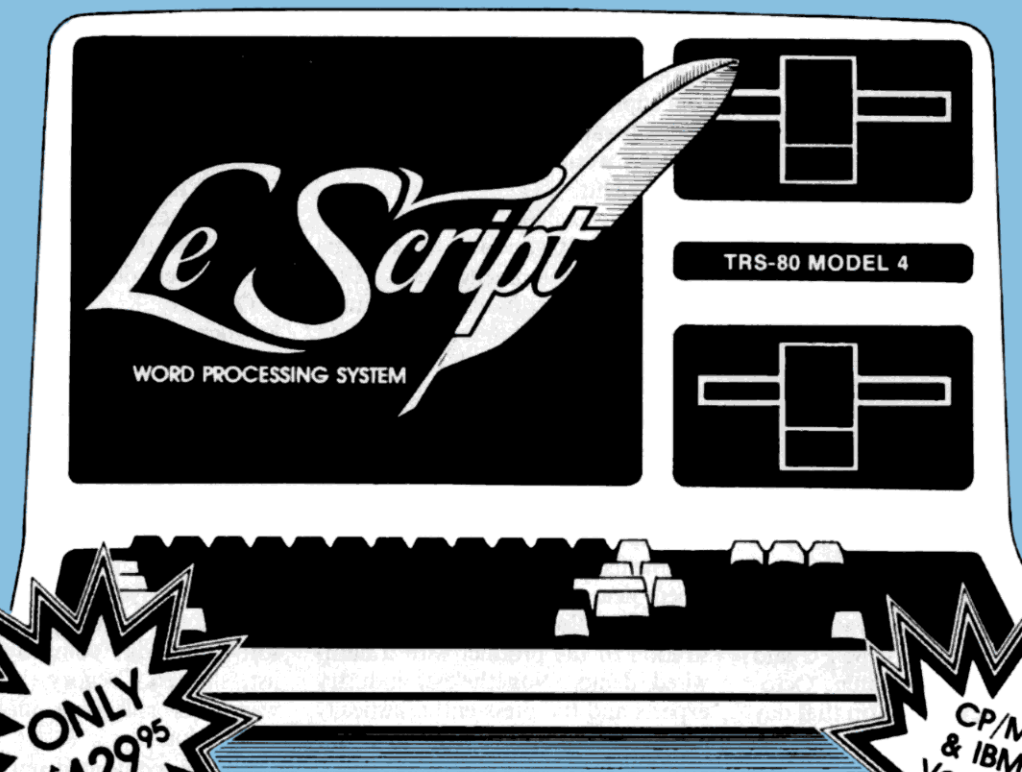
Office/home owners are relative high rollers, spending \$3,500-\$4,000 for IBM PCs, Apple IIIs, Macintoshes, or other high-performance computers which typically have 128K or more RAM. Office/home users are mostly concerned with household and business management, word processing, and communications.

Now you know where you fit in the computer caste system. ■

Model	1984	1983	1982
III/4	25.8	28.1	27.2
II/12/16/2000	19.4	21.4	25.7
Color Computers	10.3	9.8	7.2
Portable/Pocket computers	6.0	3.1	2.5
Printers	17.0	16.5	16.7
Software	8.6	9.2	8.5
Other	12.9	11.9	12.2

Figure. Tandy's computer and computer-related shipments for fiscal 1982-1984.

TRS-80 MODEL 4 Word Processing Program



ONLY
\$129.95

"For \$129.95 you'll be
hard-pressed to find a better
overall word processing product."

(LSI JOURNAL, January, 1984)

CP/M
& IBM
Versions
\$199.95

- ☐ 80x24 DISPLAY using TRSDOS 6 or any MODEL III DOS. Built-in FORM LETTER and MAIL-MERGE capabilities.
- ☐ Built-in HYPHENATION capabilities.
- ☐ 55 separately programmable MACRO FUNCTION KEYS.
- ☐ Performs PROPORTIONAL-SPACE right-margin justification on over 80 different printers (all drivers included FREE).
- ☐ Integrates with ELECTRIC WEBSTER spelling checker.
- ☐ Keyboard entry and printing of 31 European Characters and special symbols.
- ☐ LeScript also available to run on TRS-80 MODEL I, MODEL III, LNW-80, LNW-TEAM (80x24), Holmes VID-80 (80x24), and Lobo MAX-80 (80x24).
- ☐ CP/M and TRS-80 MODEL II versions now available (only \$199.95).
- ☐ MODEL 2/12/16 Versions now available for TRS-DOS 2.0, TRS DOS 4.2 and CP/M.

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.

✓ 141

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 _____

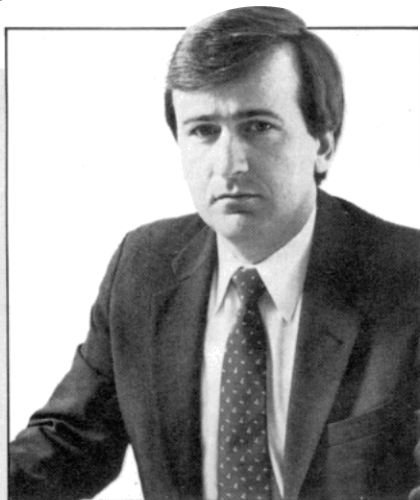
Telephone _____

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

The Company That Cried "Ovation"



Ovation's president, Thomas Gregory.

October 15, 1984, was supposed to be the day Ovation Technologies of Norwood, MA shipped its highly acclaimed integrated software, also called Ovation, for the IBM PC and Tandy 2000 (see Pulse Train, October 1984, p. 21). Instead, on that day the *Boston Globe* reported that the company had laid off all but two employees and wouldn't release Ovation in the foreseeable future.

The Oct. 29, 1984, *Mass High Tech* traced the history of Ovation's rise and fall, a story of particular interest to Tandy 2000 owners, because the product was billed as the brightest star among software packages for the 2000. It was to be a state-of-the-art integrated program with five modules: a word processor, graphics module, 7-million-cell spreadsheet, terminal program, and data base manager. Ovation was an ambitious undertaking that, during its 20-month life, cost \$6.8 million.

In December 1982, four partners founded the company, including Thomas Gregory, who was named President (see the Photo). His goal was to produce a powerful yet easy-to-use integrated business program, aimed at "knowledge workers" who didn't want to deal with 1-2-3's or Symphony's complicated commands. Gregory was able to raise

\$1.3 million in research and development capital, but his team of investors stipulated that they would own the software, while Ovation Technologies would retain exclusive marketing rights.

In March of 1983, Robert D. Kutnick came to Ovation to head up the software development staff. Programming began in earnest in June; however, design work continued even after coding had begun. The business plan called for the product to enter the market during the first quarter of 1984.

Ovation introduced its business application on Oct. 18, 1983, which was supposed to be the date for beta shipments. The product was nowhere near that stage, however, and Kutnick pulled off a press demonstration of the product with a hardwired demo. Nonetheless, industry experts and the press enthusiastically received the product.

With November came Comdex and Tandy's entry on the scene. Tandy was about to unveil the Model 2000 and Tandy and Ovation benefited from each other's projects. Even at Comdex, Ovation had to hardwire their demo, but at least according to Gregory's side of the story, Kutnick still maintained that a first-quarter delivery date was possible.

Kutnick says he was told to have Ovation ready by the first quarter, but he says by November he was feeling uncomfortable with the deadline. By December, the company had run out of money and was surviving on a \$1 million line of credit secured by the four founders. Fortunately, more venture money came through by the end of 1983, giving Ovation a \$5.5 million shot in the arm.

But new money didn't solve the company's problems. Ovation had to postpone beta shipments a second time, from January to April 1984, missing its first-quarter release. Product shipment was set for June

28, 1984. With Lotus Corp.'s Symphony scheduled to appear on July 2, the June 28 date loomed important to Ovation. But, by the end of March, the technical staff told Gregory that the project wasn't close enough to completion for beta testing and that Ovation would miss the new beta date.

On May 1, 1984, Gregory fired Kutnick. Gregory decided to scale down the software package by eliminating the communications and data base modules. By early July he realized that even the scaled-down version wouldn't be ready for some time.

The company announced no more completion dates, and in July laid off 50 employees, including some of the software development staff. A software audit, completed in August, showed Gregory that the software was still nine months from completion.

Layoffs continued until early October, when only Gregory and the company's financial controller, John McDonough, remained on board. Development on Ovation ceased; however, when *80 Micro* contacted Gregory in October, he said, "Ovation Technologies still exists and will continue to exist. The company will not file for Chapter 11 relief."

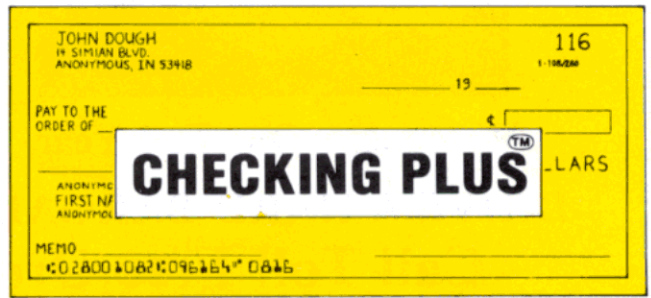
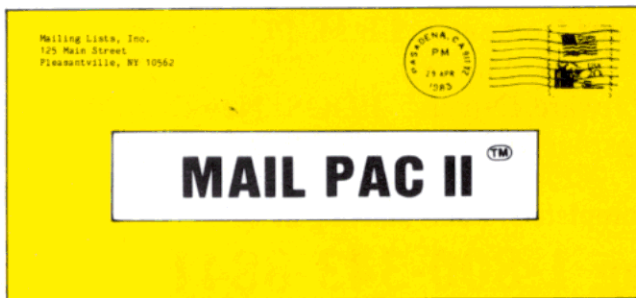
At the time, Gregory wasn't sure if he would try to raise money to continue the project or sell it as-is for another company to finish. He cited bugs as the main reason for the delays, but from stories emanating from the company's Norwood, MA, office, it's clear personality problems also played a major role.

Asked how Ovation compares to Symphony or Framework, Gregory insisted that his product is truly innovative as well as easy to use. Despite everything that's happened, Gregory remains hopeful that Ovation will somehow come to market... someday. ■

ANYONE CAN USE OUR SOFTWARE!



MAIL PAC II and CHECKING PLUS represent a new generation of computer software. Our software doesn't even need a manual! Anyone can quickly learn to use either package by following simple, explicit on-screen instructions. But, for those of you who insist -- we've included a complete user's manual as well.



MAIL PAC II FEATURES:

High Capacity --

Stores from one to one million names in Zip Code, Numerical or Alphabetical order. The only limitation is your disk storage space.

Flexibility --

Prints your mailing list on 1, 2, 3, or 4-across labels (with up to 5 user-defined lines on each label) or as a compact, user-designed directory. The record length is completely user-defined, and each field within each of your records is completely variable (allowing storage of any number of characters for any particular address entry). Devote fields to telephone numbers, codes, or even special messages related to each particular name on file.

Powerful --

A built-in word processor allows you to create personalized form letters for each address on your list (or just a particular group of addresses).

Ease of Use --

Create new mailing lists, review existing lists, handle changes of address, delete cancelled names, sort lists, and purge duplicate names from your files. Complete on-screen instructions tell you in plain english exactly how to accomplish all of these tasks.

MAIL PAC II \$99.95

CHECKING PLUS FEATURES:

Complete Check Register --

Checking Plus stores your entire check register in a disk file, and then uses the data to balance your account, track your expenses, and help you make budget projections. Review the entire checkbook, enter checks, deposits, fees and adjustments, mark outstanding checks when paid, and get an instant cash balance at any time. All data can be viewed onscreen or printed out in report form.

Tax Preparation --

Storage of monthly and yearly totals and other important information aids in income tax preparation, for your personal use or for your accountant.

Handles the Details --

Store names and addresses for frequently written checks, then print checks to fit standard window envelopes, eliminating the need for extra typing. You can even store any comment, explanation or other message (up to 255 characters) related to a particular check.

Automatic Monthly Bill Payments --

Enter amounts and names of payees for all of your fixed-cost monthly payments, and then sit back while the system automatically prints checks.

CHECKING PLUS \$99.95

Both Programs Require 48K And At Least One Disk Drive (2 Drives For Higher Storage Capacities). And All Hard Disk Systems Are Supported.

FREE--TRS-80 Mod I,III & 4 programs supplied on DosPlus (minimum system). Complete DosPlus also available.

FOR YOUR TRS-80™ • APPLE™ • IBM PC™ • NEC™ • OSBORNE™ • XEROX™ • KAYPRO™ • TELEVIDEO™ • ZENITH™ • SANYO™
DEC™ • TI PROFESSIONAL COMPUTER™ • SUPERBRAIN JR.™ • EPSON™ • Any CP/M™ Computer
CP/M-based Computers must be equipped with Microsoft BASIC (MBASIC or BASIC-80)

TRS-80 trademark Tandy Corp. - APPLE trademark Apple Corp. - IBM PC trademark IBM Corp. - ATARI trademark Atari, Inc. - OSBORNE trademark Osborne Corp. - XEROX trademark Xerox Corp.
KAYPRO trademark Non-Linear Systems, Inc. - TELEVIDEO trademark TeleVideo Systems, Inc. - SANYO trademark Sanyo Corp. - NEC trademark NEC Corp. - DEC trademark Digital Equipment Corp.
ZENITH trademark Zenith Corp. - TI PROFESSIONAL COMPUTER trademark Texas Instruments, Inc. - SUPERBRAIN trademark Intertec Corp. - CP/M trademark Digital Research - EPSON trademark Epson Corp.

OUR SOFTWARE CATALOG

H & E Computronics, Inc., has mailed more than 1 million software catalogs since 1978. Send \$2 for our new 64-page catalog today! (We also send you our catalog FREE with every order). **DEALER INQUIRIES WELCOME**

30-DAY MONEY BACK GUARANTEE

*** ALL PRICES & SPECIFICATIONS SUBJECT TO CHANGE ***
DELIVERY SUBJECT TO AVAILABILITY

COMPUTRONICS!

50 N. PASCACK RD., SPRING VALLEY, N.Y. 10977

24 HOUR ORDER LINE
(914) 425-1535

ADD \$3.00 FOR SHIPPING IN UPS AREAS
ADD \$4.00 FOR C.O.D. OR NON-UPS AREAS
ADD \$5.00 TO CANADA & MEXICO
ADD PROPER POSTAGE OUTSIDE OF U.S., CANADA & MEXICO

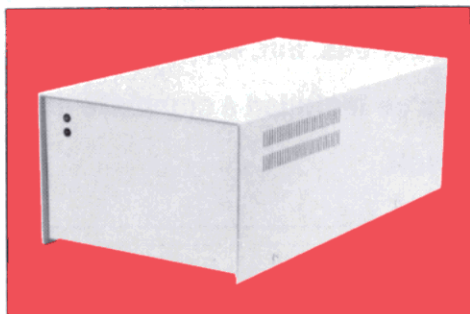
NEW TOLL-FREE ORDER LINE
(OUTSIDE OF N.Y. STATE)
(800) 431-2818



DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Hard Drives



Warranty - One Full Year

Introducing

MEGADISK™

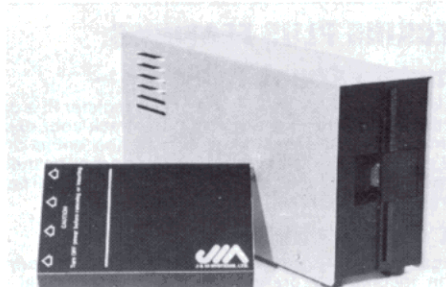
Winchester Hard Drive ready to run on the TRS 80 Model I/III/IV/4P, Color Computer, I.B.M.-PC, Apple, Franklin, Max/80.

Software Drivers: LDOS, NewDos/80, Dosplus, TRSDOS 6.0, CP/M

CALL FOR NEW LOW PRICE

DRIVE A HARD BARGAIN™ Complete systems starting at \$699.95

Call Toll Free Ordering 1-800-343-8841



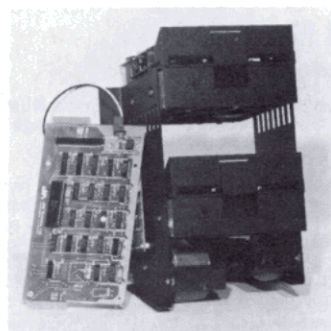
High Quality Lowest Price

Drive 0, 1, 2, 3

for the

Color Computer

Starting at ~~\$199.95~~ **CALL FOR NEW LOW PRICE**



Disk Drive Upgrade
for Model III/IV easy to install system

Starting at ~~\$309.95~~ **CALL FOR NEW LOW PRICE**

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. 10:00 am to 3:30 pm

DEALER INQUIRIES INVITED.

TERMS:

M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add \$3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.
Prices subject to change.

CANADA MICRO R.G.S. INC.

751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular Tel. (514) 287-1563
Canadian Toll Free 800-361-5155

Service! Service!

All in stock products are shipped within 24 hours of order.
Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp.

Apple Registered Trademark Apple Computer Corp

IBM-PC Registered IBM Corp.

Franklin Registered Trademark Franklin Corp.

Max/80 Registered Trademark Lobo Int.

LDOS Reg. Logical System Inc.

Dosplus - Micro Systems Software

Newdos/80 - Apparit Inc.

PRICE BREAKTHROUGH

Super Sale on New Disk Drives

Starting at **\$169.00!** CALL FOR NEW
NEW LOW PRICE

Tandon — Siemens — Remex — MPI — Teac — Shugart

40 or 80 Tracks — Single or Dual Head

IBM/PC — TRS/80 — Sanyo Computers ----- \$Call

Drive a Hard Bargain!!! For your TRS/80, Color Computer, IBM, Apple, Franklin,
Max/80, Complete Systems.....from \$699.95 CALL FOR NEW
LOW PRICE

PLEASE CALL FOR OUR MOST CURRENT PRICE REDUCTIONS.

TOLL FREE ORDERING

1-800-343-8841

GENERAL AND TECHNICAL

1-617-872-9090

Disk Drives (0123) TRS/80-IBM-Apple-TI-Franklin-Max/80-LNW	▲ CALL
Model I/III/IV Upgrade (Disk Drives - Memory)	▲
Printers—Daisywheel/Dot Matrix	▲ TOLL
Double Density Controller (Model I)	▲
Color Computer Printer Interfaces	▲ FREE
Disk Drive Operating Systems	▲
Repair Services Now Offered—FAST Turn-a-Round	▲ FOR
Apple/Franklin Compatible Add-On Drives with Case & Cable	▲
Diskettes — Lifetime Guarantee — Low-Low Prices	▲ NEW
DISK DRIVE CASES AND POWER SUPPLIES (5 year warranty)	PRICES
Printer Buffers 8K to 512K	starting at \$143.95
Model I/III/IV Speed-up Mod	starting at \$75.00
Cables—Printer/Disk Drive	starting at \$16.00

Warranty on Disk Drives — 1 Full Year Parts and Labor

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

DEALER INQUIRIES INVITED.

TERMS:

M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add \$3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.
Prices subject to change.

CANADA MICRO R.G.S. INC.

751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular Tel. (514) 287-1563
Canadian Toll Free 800-361-5155

Service! Service!

All in stock products are shipped within 24 hours of order.
Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp.

Apple Registered Trademark Apple Computer Corp

IBM-PC Registered IBM Corp.
LDOS Reg. Logical System Inc.

Franklin Registered Trademark Franklin Corp.
Dosplus - Micro Systems Software

Max/80 Registered Trademark Lobo Int.
Newdos/80 - Apparat Inc.

PRICES SLASHED!

Our Same Super Service at New Lower Prices

ELECTRIC
WEBSTER
W/Corrections

105⁹⁵



HYPHENATION
OR
GRAMMAR

37⁹⁵

Le Script **97⁹⁵**

NewsScript
77⁹⁵



93⁵⁰

DOT WRITER
W/Letterset Design System
71⁹⁵

SOFTWARE

NEWDOS80/V.2	\$ 97.50
COMREF for Newdos80	13.95
MICRO CLINIC Mod 1	24.50
MICRO CLINIC Mod 3	28.50
ARRANGER II	44.95
TRASHMAN	32.50
FASTER	22.95
R.P.M.	21.50
DSMBLR II	33.95
PRO-DUCE	33.95
SUPER UTILITY +3.2	62.95
ZORLOF II	49.95
MSCRIPIT	55.95
EDAS IV	84.00
PRO-CREATE	84.00
OMNITERM	64.95
CYBERCHESS	24.95
TALLYMASTER	54.75
MAXI CRAS	74.95
MAXI MANAGER II	146.95
ENBase	132.50
SBSG Accounting Modules	
Model 1 or 3	165.00
Model II	240.00
MAS80 Accounting	
Syst.	299.95
EDIT-Basic Editor	33.50
PASSWORD 300	
Modem	184.95
PASSWORD 1200	
Modem	339.95
VOLKSMODEM w/cable	81.90

VERBATIM DATALIFE DISKS	
5 1/4" SS/DD	22.95/10
5 1/4" DS/DD	29.95/10

WRITE FOR OUR
FREE CATALOG

DOSPLUS 3.5
\$50⁹⁵

DOSPLUS 4A
with M-ZAL
115⁹⁵

6.X PLUS
Improve Your TRSDOS 6.2
37⁹⁵

MTERM
Special Price thru 1/31/85
\$49⁹⁵

MOD4 Speedup Kit
By Alpha Technology, Inc.
75⁰⁰

TEAC DRIVES
FD55A 40 Track 145.95
FD55B 40 Track Double 179.95
FD55F 80 Track Double 199.95
The above Teac Drives are half height bare drives and include a full year limited warranty.

- Free Use of Credit Cards
- Friendly, Honest, Reliable Service

- Toll Free Order Line

- 24-Hour Shipping for Items in Stock
- Large Selection-Call for Items Not Listed

We accept Visa, MasterCard, check, cash money orders, COD, and POs on approval. In the 48 continental States, please add \$2.50 for UPS standard shipping. Alaska, Hawaii, FPO, U.S. Mail, and foreign orders are charged actual shipping & handling charges. COD orders are charged an extra \$2.00 and require cash or certified check upon delivery.

When ordering by mail include your telephone number, credit card information, computer model, memory size, and number of drives. Colorado residents add appropriate sales tax. Prices are subject to change without notice.

TOLL-FREE ORDER LINE
1-800-468-4474

COLORADO/TECHNICAL
(303) 861-9250

AMI applied
microsystems,
inc.
612 Washington, Denver, CO 80203

Stop Basic!

Model 4 Basic users (TRSDOS 6.1.2) can keep Basic from converting CHR\$(9)s or horizontal tabs into a string of spaces with a POKE &H40FD,&H18 command.

This is especially useful when you're producing dot graphics on a printer as this is the only character that doesn't reproduce correctly.

Seth Monger
4694 Coas Bay Wagon Road
Roseburg, OR 97470

Printing Problems

When using the DWP-410 Super-Script printer driver with my DWP-210 printer in proportional space mode, I encountered this problem: Three characters (the hyphen, uppercase M, and uppercase W) on the proportional print wheel have a different width on the DWP-210. As a result, lines with these characters don't justify properly. Also, the bold print feature works incorrectly with these char-



acters. You can correct the DWP-410 printer driver with the following patches in Model III TRSDOS:

PATCH DWP410/CTL (ADD=BAE2,FIND=08,CHG=0A)

PATCH DWP410/CTL (ADD=BB02,FIND=10,CHG=0E)

PATCH DWP410/CTL (ADD=BB0C,FIND=10,CHG=0E)

To avoid any confusion over drivers, change the name of the patched

driver to DWP210/CTL and the printer type on existing documents to DWP210.

Matt Parker
P.O. Box 296
Grayson, LA 71435

A Change for the Better

Here's a short modification to MPBANK/JCL for Model 4 Multiplan that lets you see your storage disk directory before you enter Multiplan. My routine first sets up the Memdisk and gives you these three options: enter Multiplan without a file, display the directory in drive 1 and then enter MP and the file you want loaded, or exit to DOS. Line 6 sounds several tones that prompt you to enter your choice.

My method takes just a few seconds longer to run than the regular MPBANK, but the added options are worth the wait. You can also apply the program to Scripsit and Lazy Writer.

```
1 system (drive = 2, driver = "MEMDISK")
2 D
3 D
4 Y
5 copy mp/bak mp/ovr:2
6 //ALERT 7,6,5,4,3,2,1
7 // . SELECTION MENU
8 //KEYIN 1 ENTER MP, 2 CALL DIR DR 1,
9 //3 EXIT
10 MP
11 //2
12 DIR :1
13 // INPUT ENTER MP AND THEN THE
14 // FILE YOU WANT
15 //3 EXIT
16 //STOP
```

Lance K. Mertz
Snohomish Publishing Co. Inc.
P.O. Box 499
Snohomish, WA 9829

Side Steps

Carl Oppedahl's "The Searcher" (C-Notes, June 1984, p. 157) discusses creating a program to redirect the Model 100's ADDRSS string Find

The following articles were inadvertently left out of 80 Micro's 1984 Article Index (December 1984, p. 198):

Author	Title	Issue:Page
Antunes, George	What's So Good About CP/M?	4:42
Brothers, Hardin	Making Your Selection: Choosing the Right Editor/Assembler	9:58
Lobdell, Gregory E.	A Better Breed of Basic	7:94
Wilson, C. David	Oops—Wrong Disk	4:160

The following reviews were inadvertently left off the 1984 Review Index (December 1984, p. 196):

Product	Manufacturer	Issue:Page
CP/M 2.2	Montezuma Micro	3:94
dBase II	Ashton-Tate	1:80
LC Compiler	Misosys	2:100
Secret Guide to Computers	Birkhauser Boston Inc.	10:36

In addition, Dan Robinson's "The Stripper" was published in July, not in June as stated in the Article Index, and the review of Nanos Systems' Reference Card for the CP/M System appeared in October, not in August.

80 Micro regrets these errors.—Eds.

READER EXCHANGE

function. I've found that you can sidestep the whole issue by naming D“(FILE).DO” as “ADRS.DO”. This way, your document file becomes ADRS.DO.

*Hamish Drummond
P.O. Box 310
Cayman Islands
British West Indies*

Aid Forum

I'm running a TRS-80 Vidtex (Radio Shack catalog number 26-1588) as my terminal driver on a Model III, and need a patch that converts the left-arrow key from a BS (ASCII 8) to a DEL/RUBOUT (ASCII 127). I've disassembled the program, but can't find the keyboard look-up table. Also, any ideas where I could get a commented source to Vidtex or any equivalent assembler terminal driver?

*Wayne Smith
Department of Accounting/M.I.S.
Cal State Northridge
Northridge, CA 91330*

Can anyone help me locate a memory map? Computers exported to Germany contain a ROM different from the ROM referred to in *80 Micro*. Also, I'm interested in any Model 100 software, especially a Basic Compiler.

*Hans-Heinrich Bast
Erbacher Str. 1
D-6200 Wiesbaden
West Germany*

I belong to CompuServe and use a Model III with a Lynx modem. I bought Videotex Plus so I could download from CIS, but the software package doesn't seem to work. I get as far as “Data carrier restored” and the program quits. I'd appreciate any assistance.

*Bob Eichel
515 Ash St.
Vandenberg AFB, CA 93437*

I'm trying to find software connected with floor loom handweaving, particularly for looms with eight harness-

es. The programs must be suitable for the Model 4P and a DMP-420 printer driver. My main interests are draw-downs, fabric analysis, and pricing calculations for raw materials.

*Joel Kahn
Route 1 Box 129C
Mountain View, MO 65548*

Error Trap

The photographs of the DMP-110 and DMP-420 printers are incorrectly labeled (Reviews, November 1984, p. 39). The printer in Photo 1 is the DMP-420, while the printer in Photo 3 is the DMP-110.

—Eds.

To correct the error in the Zap listings of J.L. Kissel's “Tape Transfer” (November 1984, p. 125), change the code at sector 00, offset C0 from 53 to 55.

*Bob Hardy
71014 Austin Ave.
Fort Hood, TX 76544*

PROFESSIONAL QUALITY SOFTWARE THAT'S AFFORDABLE

From MISOSYS - Supporting the TRS-80 users since 1978

ADE	\$39.95	MSP-01	\$24.95	PRO-MACH2	\$24.95
CMD-FILE	\$24.95	PaDS	\$24.95	PRO-MLIB	\$24.95
CON80Z	\$24.95	PRO-ADE	\$39.95	PRO-PaDS	\$24.95
CONVCPM	\$39.95	PRO-CESS	\$24.95	PRO-SAID	\$24.95
DD&T	\$24.95	PRO-CON80Z	\$24.95	PRO-XFTS	\$24.95
DW2PS/FLT	\$24.95	PRO-CREATE	\$74.95##	PRO-ZCAT	\$24.95
EDAS 4.3	\$74.95##	PRO-CURE	\$39.95	PRO-ZGRAPH	\$24.95
ESP	\$24.95	PRO-DD&T	\$24.95	PRO-ZSHELL	\$24.95
GRASP	\$24.95	PRO-DUCE	\$24.95	SAID	\$24.95
HartFORTH	\$74.95##	PRO-ESP	\$24.95	SOLE	\$14.95
IFC	\$24.95	PRO-GENY	\$24.95	VRHARD	\$74.95
LC 1.2	\$124.95**	PRO-HartFORTH .	\$74.95##	X-FTS	\$24.95
LCOPY	\$39.95	PRO-HELP	\$14.95	ZCAT	\$24.95
MACH2	\$24.95	PRO-IFC	\$24.95	ZGRAPH	\$24.95
MLIB	\$24.95	PRO-LC	\$124.95**	ZSHELL	\$24.95

US/CANADA Shipping: ** add \$5, ## add \$4, All others add \$2 each

C PROG LANGUAGE by K&R . \$21.95 PROGRAMMER'S GUIDE TRSDOS 6 by Soltoff . \$14.95
MISOSYS 3/4" Binder \$9.95 | Perma Products DISK MAILERS 10-pak | \$9.95 || CENTECH DISKS - Box of 10 - Most colors in stock - Specify COLOR | | | | \$24.95 |

MISOSYS, Inc. PO Box 239 Sterling, VA 22170-0239 703-450-4181
We accept Check/MasterCard/VISA/CHOICE - Call or write for catalog

✓107

SPECIAL #1**LC Compiler & book: \$114.50**

Save \$55.00 on an ideal compiler for anyone interested in the "C" programming language. The MisoSys LC compiler combined with "The C Programming Language" book and the EDAS Editor/Assembler. For Model I/III under LDOS or DOSPLUS IV, Model 4 under TRSDOS6 or DOSPLUS IV. (Total Value is \$170.00). And LC alone, without book, is an astounding \$99.50!

SPECIAL #2**DOSPLUS 3.5; \$49.50**

A new low price on this great Model I/III DOS! Features include ease of use, powerful and versatile commands, device independence, and many extra utilities included free. This is the best DOS at any price, and the best DOS deal of the year! (Total DOS deal of the year! owners: DOS \$99.95) (Model 4 owners: If you buy DOSPLUS 3.5 added for only \$49.50!)

SPECIAL #3**NEWBASIC Enhancement Package: \$34.50**

Buy the excellent NEWBASIC enhancement package to add powerful commands to you Model I/III Basic, and we'll throw in either "The Analyst" (program speedup utility) or "The Collector" (string-delay fix utility) for FREE! (Total value: \$64.85)

SPECIAL #4**SUPREME RULER PLUS: \$26.50**

Order this fine strategy game for one to nine players and receive either "Battle of Zeigty" or "Sitter Shifter" for FREE. For Model I/III, 48K. (Also available on cassette. Total value: \$35.00)

JMG Software's YEAR END SPECIALS Continue!

We've reached into our product line and pulled out the great specials outlined above. We've made some incredible deals, so get 'em quick before the prices go back up. And, of course, we still have our everyday great values as outlined below. Remember, we are THE source for TRS-80 Model I, III and 4 software!

LESCRIPT-\$94.50

(By Anitek; list \$129.95) We've made this excellent word processor affordable: loads of features, great printer support, ease of use, and more. For models I/III or 4; makes use of extended features on Model 4 including 128K RAM if you have it. (Ask for a free demo disk if you're not sure about it.)

DOSPLUS IVa-\$109.50

(By Micro Systems; list \$169.95) A great price on a great DOS; for the Model 4 this is by far the best DOS around. It beats TRSDOS 6 in speed, versatility, and power. Compatible with programs and media for TRSDOS 6; also comes with the M-ZAL Editor/Assembler program and other utilities. Most users rate it a 10 out of 10 on our reply cards!

DOTWRITER 4.0-\$69.50

(By Prosoft; list \$99.95) Use the full power of your printer with this excellent custom-character set program. Use one of the many supplied or available character styles, or make your own with the LDS utility included. Model I/III or Model 4 (specify); also specify printer brand (Epson, DMP, Okidata, Prowriter or Gemini).

ElectricWebster \$99.50

(By Cornucopia; list \$149.95) A fine spelling checker program, integrates with most word processors. Has a 50,000 word dictionary, and it allows you to add your own words also. A Grammar-checking option is available for \$38.50 extra.

KSoft's LOG and SUPERLOG 4

These "Electronic Notebook" programs are like a "memo pad" available instantly, even when running other programs. LOG is for Model I or III at \$44.50; SUPERLOG-4 has many advanced features and is available for \$99.50 (list \$119.50) for the Model 4. Once you start to use it you'll wonder how you ever did without it!

TASMOM \$29.50

(By TAS; list \$39.95) An excellent machine language monitor/debugger. Available for Model I/III or Model 4 (specify). Loads of features, this is one of the best programs of its type. The price will soon go up to \$34.50, so get 'em quick...

TO ORDER:

We accept orders by phone or mail. When ordering please specify the Model of TRS-80 you own, the exact program(s) wanted, and the method of payment. We accept Check, Money Order, VISA, MasterCard, and Gold. Please enclose \$2.50 for shipping costs. For Electric Webster and Dotwriter, please mention your word processor and printer brands.

TAS Journal & Disk: \$15.00

The Alternate Source Programmer's Journal has published a "Special Issue", full of great information for any serious users and programmers.

New - JMG's APPLICATIONS "TOP TEN"

Want to know what's popular in the TRS-80 software world? We've compiled this list of the "top ten", in order, based on our sales for one month ending in November.

1. LESCRIPT (\$99.50)
2. DOTWRITER 4.0 (\$74.50)
3. DOSPLUS (\$59.50 / \$129.50)
4. TAS Journal & Disk (\$15.00)
5. ZORLOF II (\$49.50)
6. Electric Webster (\$118.50)
7. TASMOM (\$29.50)
8. Tallymaster (\$54.50)
9. Analyst/Collector (\$19.50 ea.)
10. DSMBLR III/PRO-DUCE (\$34.50)

COMMUNICATIONS

We sell many communications/terminal programs, and here's a partial listing:

MODEM-80	\$34.50
LAZYCOMM	\$29.50
MTERM	\$64.50
MTERM Mod 4	\$64.50
Ultraterm 2	\$64.50

**"TOLL FREE" ORDER LINE:
(416) 389-6086**

Instead of a regular toll free number, we deduct \$2.00 from your order to pay for your phone charge (which is usually less than \$2). That way you come out ahead, we come out ahead, and everyone is happy. And if you order by mail, ask for our "Toll Free Discount" and deduct \$2.00!

(Phones are staffed 10 A.M. to 7 P.M., Monday to Saturday, except Wednesday).

OUR PRICING POLICY:

We will beat any legitimate price advertised for any product that we carry. If you find a lower price advertised, our price will be \$1.00 less, under the same conditions (eg. same shipping and other charges, etc). To receive the lower price you must mention the location of the other ad when ordering.

**WRITE FOR OUR
FREE CATALOG!****OUR GUARANTEE:**

We sell only top-quality software. If, however, you are unsatisfied with a product you have purchased from JMG, you may return it (in good condition) within 10 days for a refund, less a \$2.50 handling charge for programs under \$50 (\$5.00 for programs over \$50). We also ask that you send us a letter stating the reason for your return.

**JMG SOFTWARE
INTERNATIONAL****THE FINE PRINT:**

Shipping Charges are \$2.50 in Canada and U.S. Overseas surface shipping is \$5.00, \$10 for air mail. All prices in U.S. Funds. Add \$1.50 for COD Charges. Model III programs will all run on a Model 4 in III mode.

**3235 LOCKPORT ROAD
NIAGARA FALLS, NY 14305**

OR

**710 UPPER JAMES ST.
HAMILTON, ONTARIO
CANADA L9C 2Z8****Phone: (416) 389-6086**

“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

352B8

READER EXCHANGE

New User's Groups

Tandy Hobart User's Group
G.P.O. Box 1271 N
Hobart, Tas. 7001
Australia
Contact: H.L. Smith

SYDTRUG
P.O. Box 43
Erskineville, N.S.W. 2043
Australia
Contact: Geza A. Dujmovich

Central Coast TRS-80 User's Group
408-B N. Elizabeth
Santa Maria, CA 93454

Calgary Color Computer Club
Calgary, Alberta
Canada T2W 1T4
Contact: Don Towson

Send correspondence to Reader Exchange, c/o 80 Micro, 80 Pine St., Peterborough, NH 03458.

DEBUG

The following routine corrects Dynaterm's clear buffer routine that deletes routines placed in high memory ("Smart Talk" by David M. Fischer, May 1984, p. 50):

```
11010 CLRBUF NOP
11020 PUSH BC
11030 PUSH HL
11040 LD HL,(HIMEM)
11045 LD BC,EOP
11050 OR A
11055 SBC HL,BC
11060 LD C,L
11065 LD B,H
11070 LD HL,EOP
11080 LD DE,EOP+1
11090 LD (HL),00H
11100 LDIR
11110 POP HL
11120 POP BC
11130 RET
```

Joe Johnson
P.O. Box 654
Middlefield, OH 44062

Four of the ROM routines in "Rooting out ROM Routines" (October 1984, p. 120) contain errors in the exit conditions. Here are the corrections for these ROM routines:

01C9H (Table 3): "All registers altered" should read "A register altered."

021BH (Table 3): In addition the registers listed, the A register is also altered.

0FAFH (Table 3): "A register altered" should read "All registers altered."

RST 18H (Table 5): The A register is destroyed.

Bob Covington
1239 Cheverly Court
St. Louis, MO 63146

Line 280 of Peter G. Savard's "Testing 1-2-3" (October 1984, p. 70) should read:

```
280 IFR = 1 THEN C1 = PEEK(PO):
POKEPO,95:FOR I2 = 1 TO 10:NEXT I2:
POKE PO, C1:GOTO 230 ELSE 200
```

—Eds.

SUPERTAX™ Get Supertax by Rockware Data and get the jump on your 1984 Income Tax Planning

THIRD SUCCESSFUL YEAR! • THOUSANDS ALREADY IN USE!

Use SUPERTAX personal income tax programs to calculate your tax liability now and have plenty of time to make year-end investment decisions to improve your position. SUPERTAX was developed by a practicing CPA with a Master's degree in tax accounting. Highly acclaimed by tax pros, CPAs and tax preparers, SUPERTAX is easy to understand and a pleasure to work with. Available for TRS-80 (2 drives), Apple II+, IBM-PC, Kaypro II and Sanyo MBC-550 Series.

- SUPERTAX is fully screen-prompted and includes a manual loaded with valuable tax information, instruction and guidance.
- SUPERTAX instantly recalculates your entire return when you change any item.
- SUPERTAX prints directly on IRS forms.
- SUPERTAX DATA can be stored on a diskette.
- SUPERTAX updates are available at 50% discount to registered SUPERTAX owners.
- SUPERTAX is an essential addition to your personal software library—best of all it's tax deductible.

FOR TAX PLANNING

Using either screen or printer output, SUPERTAX generates clear and concise summaries of Page 1 and 2 and Schedule A of FORM 1040 allowing you to see at a glance and to quickly comprehend your tax situation. This program also prints an OVERALL SUMMARY of the return showing Adjusted Gross Income, Itemized Deductions, Taxable Income, Regular Tax and Payment Due or Refund—all of which are calculated by the program. SUPERTAX also calculates the moving expense deduction, investment credit, taxable capital gains, political and child care credits, medical limitations, and much more. Input is fast and easy and changes can be made in seconds. This program actually makes tax planning a breeze.

FOR RETURN PREPARATION

SUPERTAX PRINTS THE INCOME TAX RETURN: This program prints page 1, page 2 of the FORM 1040, Schedules A, B, C, W and G (income averaging) of the FORM 1040 as well as FORM 3468 (investment tax credit) on standard IRS government forms or on blank computer paper for use with transparencies. Any item of input can be changed in seconds and the entire return is automatically recalculated to instantly reflect the change.

TRS-80, Apple II+, IBM-PC, Kaypro and Sanyo are trademarks of Tandy Corp., Apple Computer, Inc., International Business Machines, Non-Linear Systems, Inc. and Sanyo Business Systems Corp. respectively.

FOR DEPRECIATION CALCULATION

SUPERTAX also includes a stand alone depreciation program which calculates and prints your complete depreciation schedule using both the old rules and the new ACRS rules. Output from the depreciation program is designed to serve as a supplement to IRS FORM 4562.

\$99

New—PREPARER'S EDITION: Includes all of the above, PLUS, it will also print Schedules D, E, SE and FORM 6251. The PREPARER'S EDITION also prints preparer data at the bottom of page 2 of the FORM 1040.

\$149

TO ORDER Send Check or Money Order to **ROCKWARE DATA CORP.** P.O. Box 365, Plano, TX 75074, or call 214-596-0588. VISA and MasterCard accepted. Add \$3.00 shipping on all orders. TX residents add state tax.

Rockware Data Corporation

512

HOWE SOFTWARE PRODUCT GUIDE

SYSTEM DIAGNOSTIC

Is your computer working correctly? **Are you sure?** Find out for certain with System Diagnostic, which has complete diagnostic tests for every component of your TRS-80™ Model 1, 3 or 4.

- **ROM:** checksum tests
- **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.

System Diagnostic \$99.95

MAILING LIST

Maintains mailing lists of over 1250 names per disk file. Add, change, delete, or find names. Sort according to the data in **any** field. Labels printed in 1, 2, 3, or 4 columns, with adjustable tabs.

Model 1, 3, or 4 version \$69.95
Mod. 2/12 or IBM version ... \$79.95

SMALL BUSINESS MANAGEMENT SYSTEM

A complete system for using your computer to manage a small business.

- **Order Entry:** enter orders, print invoices, change past invoices. Use pre-printed forms or plain paper.
 - **Bookkeeping:** complete general ledger by user-defined categories. Print monthly or year-to-date summaries and ledgers.
 - **Accounts Receivable:** show balances due from unpaid invoices at any time.
 - **Accounts Payable:** show amounts you owe for unpaid bills in any category.
 - **Inventory:** complete summary of products sold by part number and prices charged. Limited to 1,000 8-character part numbers (2,000 for MS-DOS).
 - **Installation package** tailors the programs to your business.
- Available for: TRS-80™ Models I, III, 4, 2, 12, 16 (TRSDOS), or 2000, IBM-PC, and most CP/M computers.

Need more information? Ask for our detailed description of this program with sample forms and reports.

All versions \$250.00

TYPITALL — The most powerful TRS-80 Word Processor

TYPITALL is a word processor which is upward compatible with SCRIPSIT™ for the TRS-80™ Models 1, 3 and 4. If you know SCRIPSIT™, you can start using TYPITALL immediately. Even if you have never used a word processor before, you will find TYPITALL easy to learn, and full of so many powerful features that you'll wonder why other word processors don't have them. Following is a list of some of TYPITALL's features. (If you need to know more, ask for our **free** catalogue.)

- Send **any** control or graphic/special character to the printer.
- Print the formatted text **on the screen** before going to the printer.
- Send the formatted text to a **disk file** for later printing.

"If you like SCRIPSIT™, you'll probably love TYPITALL." - 80 Micro.

TYPITALL Demo Version \$49.95
TYPITALL Complete Version \$129.95
TYPITALL with Spelling Checker \$179.95

HOME BUDGET and CHECKBOOK ANALYST

Combines the functions of a checkbook program with budget analysis, comparisons, summaries and projections.

First, it is a checking program, which can be used to maintain your checking account. Enter deposits, print check registers, compute your current balance.

The program analyzes your income and expenses, keeps track of your budget. Computes monthly and year-to-date income and expense summaries, and projections for the year based on data through a known month. Monthly expenses can be compared to a pre-established budget.

Model 1/3/4 disk version ... \$59.95
Model 1/3/4 cassette version \$29.95
Mod. 2/12 or IBM PC version . \$39.95

SMALL BUSINESS ACCOUNTING

Based on Dome Bookkeeping Record #612, this program keeps track of income, expenses, and payroll for a small business.

Complete ledgers are maintained for both income and expenses. The program computes monthly, through last month, and year to date summaries.

The payroll section (not included in cassette version) contains provision for up to 99 employees with up to six categories of deductions. The program can print both checks and summaries of payroll for one employee or all employees.

Model 1/3/4 disk version \$59.95
Model 1/3/4 cassette version \$29.95
Mod. 2/12 or IBM PC version . \$39.95

TRS-80™ MODEL III ASSEMBLY LANGUAGE

A complete course in assembly language, written for the **beginner**. Contents include:

- The Z-80 instruction set
- TRS-80™ Model III ROM and RAM
- Using the Editor/Assembler
- Reading, printing, and moving data
- Arithmetic operations with integers
- Floating-point and BCD numbers
- Logical and bit operations
- Cassette input and output
- USR subroutines in BASIC
- RS-232-C data communications
- Disk input and output
- The TRSDOS 1.3 disk operating system

With the book you can also purchase **Monitor #5**, a comprehensive machine language monitor and debugger program. (Monitor #5 also avail. for Models 1 & 4.)

Book only \$16.95
Monitor #5 only \$22.95
Book and Monitor #5 \$29.95

SMART TERMINAL

The **intelligent** communication program. Use your TRS-80 to communicate with other computers, bulletin boards, information services, time sharing, or for data transmission.

- Memory buffer holds data to be transmitted or received.
- Automatic transmission from buffer.
- Automatic storage of incoming data.
- Character translations.
- Data files compatible with word processors and BASIC programs.
- True BREAK key.

Model 1, 3 or 4 version \$74.95
Model 2/12 CP/M version ... \$79.95

Howe Software

14 Lexington Rd., New City, NY 10956

Developing software for TRS-80 computers since 1979.

24-Hour TOLL-FREE Order Number:

Outside California call:

(800) 428-7825, ext. 169

Inside California call:

(800) 428-7824, ext. 169

Visa, Master Card, or COD orders only.

For information call:

(914) 634-1821

✓175

Add \$3.00 postage & handling.
 New York residents add sales tax

*TRS-80 is a trademark of Tandy Corp.

Open Communications: Let's Talk Transfers Files

by Gary A. Shade

edited by Ryan Davis-Wright

In a world of multiple computer ownership, where compatibility is a big consideration, file transfer utilities are gaining in popularity and importance. Such utilities let you share data and programs between dissimilar computers. The arrival of Tandy's new MS-DOS machines (the 1000 and 1200) makes this type of utility especially important to TRS-80 users. If you own both an MS-DOS machine and one of Tandy's non-MS-DOS computers, you'll probably want to transfer data between them.

Let's Talk supports ASCII-file transfer between any two of the following computers: IBM PC/XT, Tandy 2000, Compaq and other compatibles, and the TRS-80 Models III, 4, II, 12, and 16 (this review was written before the 1200 and the 1000 were available). Let's Talk does a good job at its specific function. Unfortunately, it stops just short of being the panacea you would expect.

Let's Talk contains four master program disks, one for MS-DOS computers, one each for the Models III and 4, and an 8-inch disk for the Models II, 12, and 16.

I used a Compaq and a Model 4 (in both Model III and Model 4 modes) to test Let's Talk.

File Transfers

Installing Let's Talk is easy, since all you have to do is boot it up. You have to load Let's Talk into both computers involved in a file transfer. You can link the computers via modems (either locally or by telephone lines) or by a

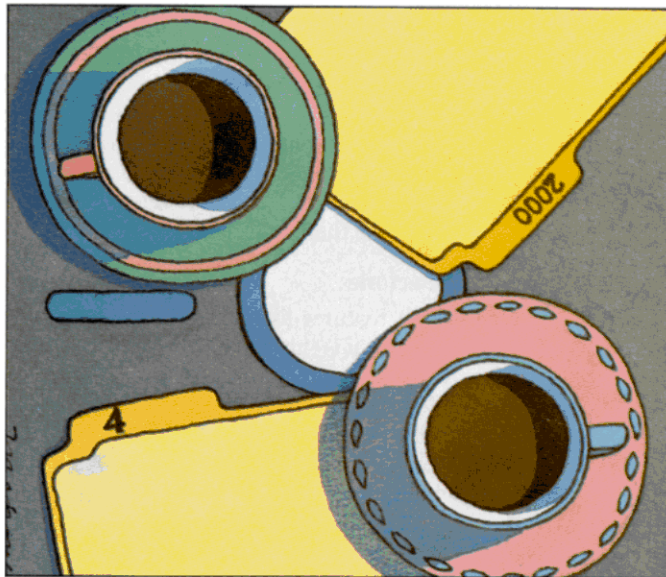


Illustration by Katherine Mahoney

null cable (crossover). The manual explains in detail how to physically establish the communications link.

After you get the program running, you're prompted for a transfer baud rate. Let's Talk allows 300-, 1,200-, and 2,400-baud operation. Of course, you must set both computers to the same baud rate for communications.

Then Let's Talk asks if you want to be "consulted prior to the transfer of any files to this computer." Pressing the Y key in response triggers the receiving computer to intervene before each file transfer. At that time, you can specify a new file name for the file you're about to receive, and whether or not you want to overwrite any existing file that has the same file name. In this mode, you can't use either terminal unattended.

If you press the N key in answer to the consultation prompt, the computer initiating the file transfer prompts you for the file name you want transmitted and the file name the receiving computer should use.

Let's Talk displays a transfer status line at the top of each computer's display, informing the operator of the program's status and the communication's line status (quiet or link-established). The program offers three basic modes of operation:

- Quiet. Waiting for you to establish a communications link.
- Conversational. The link is established. Whatever you type on one computer automatically appears on both, letting you and the second operator communicate directly.
- Sending or receiving a file.

Either computer can initiate a transfer by electing to send or receive a file. You control the program in all modes of operation with a combination of the control key and another key.

Once you supply the file names, the file transfer begins without further operator intervention. Control-Q stops any transfer in progress and returns both computers to the conversational mode.

Save to ASCII

I used Let's Talk to transfer a 75,000-byte text file from a Compaq to a Model 4 without any problems. I also transferred other files of varying length from the Model 4 to the Compaq, again without a hitch.

You must save files not normally stored in ASCII format in ASCII prior to using Let's Talk. Although the user's manual says that "most files need no special preparation," it later states that Scripsit, Basic, Lotus 1-2-3, and some data base files may not be in ASCII format and must be converted. The exceptions, therefore, seem to be

the rule. The manual contains ample explanations of the types of files you can transfer and where to find the information necessary to do so.

Since Let's Talk supports only ASCII file transfers, you can't transfer binary files. Other brands of file transfer utilities let you convert binary files to ASCII-hex files, which you can then transmit; after the receiving computer gets the file, the utility converts it back into binary format. However, Let's Talk lacks such a conversion utility.

Let's Talk



Good Software Corp.
12900 Preston Road
Dallas, TX 75230-9990
Models III and 4, 16K RAM
Models II, 12, and 16, 64K RAM
Tandy 2000, IBM PC/XT, Compaq, other compatibles, 64K RAM
One disk drive, RS-232
\$149

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

Basic Language Differences

The Model III normally stores Basic programs in compressed format, removing any spaces between keywords and variables. But the Basic implementation found on the IBM PC/XT, Tandy 2000, and Model 4 expects keywords and variables separated by spaces. Let's Talk provides a utility that "decompresses" Model III Basic programs by inserting the required spaces and puts the program in the proper format.

While your Basic program may now be in a compatible format, it possibly contains keywords incompatible with the different Microsoft Basic interpreters. Fortunately, Let's Talk's manual contains an entire section detailing keywords you may have to

change before you can run a Basic program on a receiving machine.

Most of the programs I had on hand contained too many incompatible keywords for the Compaq's Basic interpreter. So I wrote a short, 50-line program in Basic on the Model 4 (in Model III mode), without spaces between the keywords and variables, and I avoided the incompatible Basic keywords. I then saved the program on disk in ASCII format.

After transferring the file from the Model 4 to the Compaq, I ran the Decompress utility, and it inserted the necessary spaces into the program. I could then run the program on the Compaq.

Let's Talk also offers support for programmable modems such as the D.C. Hayes Smartmodem and describes how to use them in the manual.

Remote Directories

One of the features listed in Good Software's manual is that "files can be sent or retrieved from an unattended computer." While this is true, you can't obtain a directory from the remote computer.

Imagine this: You're on the road and remember you need a file that's on your computer at home. Fortunately, you left it running Let's Talk.

You dial up your home computer with your portable, anxious to obtain that forecast and inventory report on disk at home. You're connected and on-line with the home computer, but you can't remember the names of the files you want to download. Let's Talk offers no provision for listing the directory of your home computer from a remote one. You have to know what files reside on the default disk before using Let's Talk.

The way to get around this is to obtain a hardcopy listing of the directory prior to initiating the file transfer.

The directory function (control-D) only works on the computer where you enter the directory command, and then it only displays the directory for the default drive. For example, if the default drive on your Tandy 2000 is drive A, you can't display the directory for drive B. This severely limits the program's utility in multiple drive systems.

Conclusion

My overall impression of Let's Talk is favorable. The program works as ad-

vertised and does so flawlessly. The 50-page manual is professionally packaged and contains all the information necessary to install and operate the program. An average or even novice user will only need about 30 minutes to become proficient with Let's Talk.

However, I feel the package doesn't quite merit the price tag it carries. If the program were priced around \$80 (a more common price for utilities such as this), I could more easily recommend it.

There are several full-featured terminal programs that perform all Let's Talk functions and more. While they may not be as easy to use, you have a greater degree of flexibility in the types of data transfers allowed. If you have only two of the different types of computers supported by Let's Talk, the alternatives are more functional for about the same price.

The price of the package certainly reflects the stylish packaging and the fact that you get four program disks for the different computers it supports. If your business has multiple computers and you need to share ASCII files, you may want to check out Let's Talk. Just remember that Let's Talk is a file transfer utility and not a communications package. ■

Draftsman's Delight

by David L. Engelhardt

If you're a draftsman or if you just enjoy drafting, xT.CAD may be the program you've been dreaming about. This software package incorporates different modules that together give you a complete computer-assisted drafting (CAD) system. XT.CAD lets you create intricate pictures and diagrams and send them to a plotter for printouts. This CAD program works with any Model III or 4 with the Radio Shack high-resolution graphics board installed, and with Houston Instruments serial interface plotters DMP-29, -40, -41, -42, -51, and -52.

XT.CAD draws plots of up to 24 by 36 inches and features two display overlays, zooming, cursor speed control, single-key draw commands, display rotation, optional grids, and a help screen.

Setting It Up

All the necessary modules come on a data disk that you have to transfer to either a TRSDOS 6.1 or 1.3 disk that contains BASICG. The program provides two useful samples to familiarize yourself with the software and commands.

The documentation explains which modules on the BASICG disk you should purge to free up room for the xT.CAD programs. You also have to move the RS-232 driver to the target disk to control the plotter.

After setting up xT.CAD, you're instructed to test your graphics board with a program named HRGTEST, which comes on your BASICG disk. But you don't have to do this if you know your board's working properly.

HRGTEST takes about 20 minutes to check out all of the board's functions and capabilities. If you experience any errors, consult your Radio Shack dealer to have the problem corrected.

Point and Mark

xT.CAD supports any kind of drafting. The software contains five different-size tracing templates (labeled A-E) that correspond to the plotter paper you're using.

xT.CAD displays the E-sized tracing sheet as a default on start-up, with a scale of 10 pixels per grid unit (the

represented screen size is 21 by 30 inches). You can also select 12 or 16 pixels per grid to change the scale, which is helpful in selected drafting applications requiring inch or pound scaling.

The two cursors, called Point (an arrow) and Mark (a square), define areas of the screen where you want to invoke xT.CAD commands. While you can position them anywhere on the screen, Point is the only one you control with the arrow keys. You move Mark by positioning Point to the desired location and hitting the @ key to move Mark to Point's position.

You can increase the speed at which Point moves by 1 to 10 pixels per keystroke. Moving one pixel at a time lets you accurately and precisely control resolution. For example, if one pixel movement represents 1 inch, then the speed set at 6 would represent 6-inch increments per keystroke.

You can draw circles of any size, four different types of lines, and even arcs by hitting the appropriate keys. You use xT.CAD's scaling system to divide the screen into 1-inch grids marked at every 10 pixels, or into fractional grids. The fractional grids further divide the screen so you can create more detailed drawings.

One useful xT.CAD feature is the magnification/zoom capability. You can expand any drawing up to 10 times

its size. Since the normal scaling is 1X with 10 pixels per inch, a 3X zoom represents 30 pixels per inch.

You can create a drawing in whole or in part by using the zoom feature to decrease or increase the display. When you choose a desired zoom, xT.CAD clears and redraws the screen.

You may need to sketch without messing up a design on the display. If you decide you don't like the last item, you can erase it. This feature only pertains to the last item put on the screen. If you want to clean up the display by removing all sketch marks, hit the clear/space bar keys to clear the screen and redraw the original design.

xT.CAD lets you paint areas on the screen to enhance a display; you can fill in any area enclosed by solid lines. You can't reproduce painting on the plotter, but you can color in areas to see what a final drawing might look like.

Editing and Printing

You use the editing features to change an existing drawing, move items, and add to, erase, and correct displays. To pull an item from memory, you use the cursors to point to the item or section you want to edit. Once you locate it, you can zoom the display to enlarge it and make the necessary changes.

You define blocks using the Mark

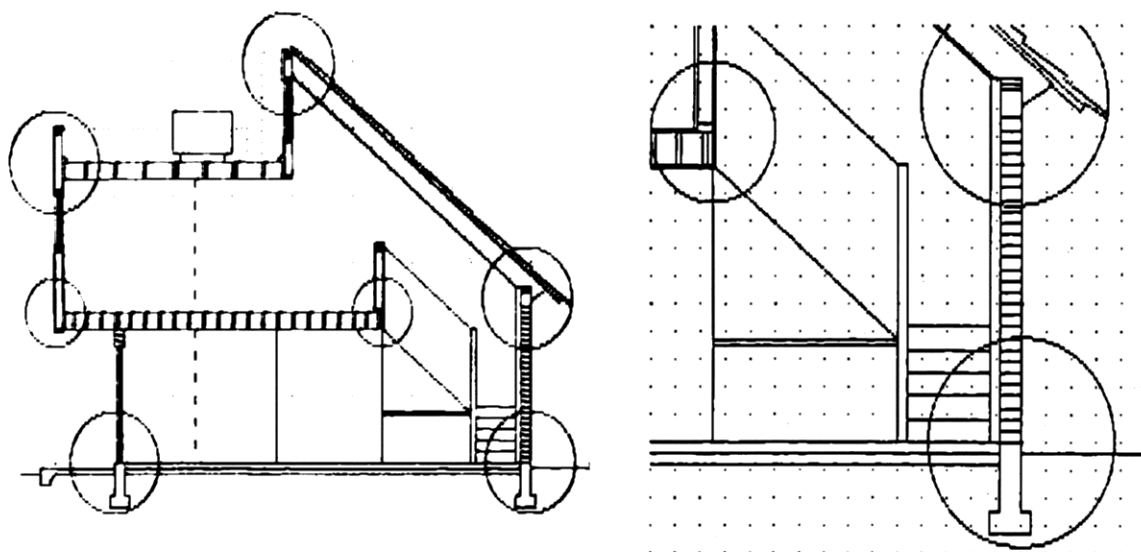


Figure 1. Magnification of drawing. Left is two times of original (2x), right is five times of original (5x). These are screen dumps onto a dot-matrix printer. A plotter would yield true circles and arcs.

and Point cursors to outline a rectangular area of the drawing. This allows you to expand, move, copy, zoom, and delete all or part of any display. You can copy an object to a different section of the screen, rotate it up to 360 degrees, or zoom in on a particular section.

You can change the drawing's position on the screen by shifting or panning the display window. The current window coordinates appear in the upper right-hand corner of the screen, and you can't shift a drawing beyond the edges of the computer's E-sheet.

Two overlay displays are available and you can call either or both at any time. This is useful if you want to create a display by superimposing all or part of another one you've created. For example, you can split up the overlays so that one contains drawings and the other text. You can also plot two overlays together, with each one plotted in a different color.

Display manipulations let you show both overlays separately, together, or swapped. You can draw only one overlay at a time and this is designated the "top" working overlay. You can't access the second overlay until you've entered at least one item into the memory of overlay 1.

XT.CAD also saves and loads displays to disk. Use prompts to select the target disk drive; once selected, XT.CAD automatically displays the directory for you.

If you've displayed both overlays on the screen, XT.CAD saves or loads only the top one. By swapping the two overlays, you can save or load the second one. A safety feature asks if you want to load a display with one currently in memory. Both cursors have to be in the upper left-hand corner (the home position) to load the displays into memory.

XT.CAD also lets you label text and insert it horizontally or vertically. This feature is useful for graphs and labeling parts. You enter all text at the bottom of the screen and XT.CAD marks the display with lines representing the direction and position of the text on the printout. It suppresses labels to prevent clutter. In some instances, they would be too hard to read when you use the zoom feature.

To print a display on the plotter, you must define the work area by a window marked with the two cursors.

*I was impressed
with xT.CAD's drawing
capabilities and features.*

*It makes the
high-resolution graphics
board truly useful.*

You set up the window around the designated area in the same way you set blocks (positioning Mark at the lower left of the item and Point at the upper right).

You can reduce or enlarge a design as you're plotting it. You enter enlargement/reduction values as a percentage; typing in 200 enlarges the final copy to twice screen size while entering 50 reduces the display by one-half.

The default value is 100 percent of the original screen size. You may select any percentage value from 1-9999, but be careful not to make the value more than the size of the plotter paper or the plotter may hang up. The last value required before plotting is the paper size selection from A-E.

A help screen reminds you of xT.CAD commands. The screen contains a brief description of each command along with the key or keys that invokes it.

A Weak Manual

The manual is the weakest part of the system. It's short and broken up into different sections, each with its own numbering system. When you buy xT.CAD, the section that tells you how to create a disk and run the program is at the very back of the manual. This obviously should be located first. You can, however, easily rearrange the sections.

Since the manual is so brief, few examples are provided on how to use the commands. I found it difficult to understand the commands or how to use them. Examples would have helped immensely. Be prepared to spend some time by trial and error to become familiar with xT.CAD's capabilities.

Despite the manual's drawbacks, I was impressed with xT.CAD's drawing capabilities and features. It's the first commercial application I've seen that makes the high-resolution graphics board truly useful. This CAD program can benefit any draftsman or engineering firm that needs such an application. ■

xT.CAD



Microdex Corp.
1212 North Sawtelle
Tucson, AZ 85716
602-326-3502
Model III, 48K RAM
Radio Shack Model III High Resolution Graphics Board (#26-1125)
Model 4/4P, 64K RAM
Radio Shack Model 4 High Resolution Graphics Board (#26-1126)
Two disk drives
RS-232
xT.CAD \$449.95
T.CAD \$249.95

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

Checkbook Plus Manages Your Money

by Wynne Keller

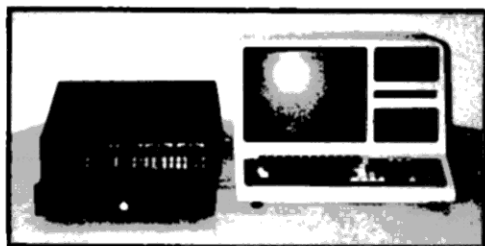
Checkbook Plus is a handy check management system for your home or small business. You can assign a transaction to more than one account; edit, delete, and sort entries; and include comments for each check you issue, as you would with a conventional checkbook record. Checkbook Plus even writes checks and makes automatic payments on periodic expenses like rent or car payments. On the whole, Checkbook Plus had some good features and it was easy to use. While it's awkward in a few places and slow in others, it generally performed well.

Set-Up and Documentation

Checkbook's documentation comes in an 8½- by 11-inch spiral-bound

REGIT

THE COMPLETE CASH REGISTER AND INVENTORY CONTROL SYSTEM



HARDWARE FEATURES:

- Heavy duty 15 6" W x 16 6" L x 4 4" H metal cash drawer.
- Locking drawer with removeable money tray
- Drawer works automatically or manually — connects directly to cassette port.

SOFTWARE FEATURES:

- Assign code numbers to your merchandise or services — You enter the code number, the screen displays price and item, then updates inventory and sales records
- Calculates subtotals, totals, sales tax (if applicable), and change.
- Screen displays in double size characters for easy viewing
- Will maintain inventory and sales records for over 3000 items (with two disk drives).
- Produces daily, monthly, and annual inventory, sales, and tax reports.
- Totals by employee/cashier.
- Printer generates sales receipt
- Cash drawer opens automatically
- Straight dollar entry cash register program available for tape systems.

TRS-80 Model III or IV Disk \$179.00

TRS-80 Model III or IV Tape \$169.00

please specify model when ordering

Calif. residents please add 6% state sales tax

check or money order to:

APCA Systems • P.O. Box 978 • Arbutle, CA 95912

for COD orders (916) 476-3356

*TRS-80 is a trademark of Tandy Corporation

✓170

LOG SUPERLOG and SUPERLOG 4

KSoft's Electronic Notebooks. Free-format information management for the 90% of your information needs that won't fit into a data-base or spreadsheet. 1024 characters per page. Lightning fast search and retrieval. Interrupt activated and accessible while another program is running.

A LOG or SUPERLOG Electronic Notebook is designed to replace your diary, address book, memo pad, card file, calendar, and scratch pad — so conveniently you will use it all day long. Call today for more information or immediate shipment.

SUPERLOG 4 for Models 4 and 4P TRSDOS 6 \$119.95

SUPERLOG 3 for I, III, 4 and 4P LDOS 5.1 \$119.95

LOG for Model I TRSDOS 2.3 \$ 49.95

LOG for Model III TRSDOS 1.3 \$ 49.95

KSoft Inc.

318 Lakeside Drive
Brandon, MS 39042

(601) 992-2239 C/S 70075,137

MasterCard or Visa accepted

Add \$5.00 for shipping and handling

Dealer inquiries welcome

(TRSDOS is a trademark of Tandy Corporation)
(LDOS is a trademark of Logical Systems Inc.)

✓331

IBMTM Compatible (OR) WILL YOU PAY TOO MUCH?

NEW

Ask About Our
"30 DAYS
Buy-Back-Policy"

MODEL 1200 640K

COMPATIBLE

1 DRIVE PLUS 10 MEG

HARDDRIVE
BUILT-IN

MODEL 2000 768K

1 or 2 DRIVES PLUS 10 MEG
HARDDRIVE
BUILT-IN

"MANUFACTURER'S WARRANTY
NATIONWIDE"

SAVE SALES TAX*
PLUS DISCOUNT

*TEXAS RESIDENTS ADD ONLY 4 1/8%

**SERVICE AND
WARRANTY NATIONWIDE**

FORT WORTH COMPUTERS

WE ARE SERIOUS ABOUT SAVING YOU MONEY

(Located 30 miles from Fort Worth)

377 Plaza • GRANBURY • NR FORT WORTH, TEXAS 76048

CALL FREE NUMBER: 1-800-433-S-A-V-E

Monday thru Friday — 9:00 a.m. to 5:00 p.m. Texas Time
(Order Inquiries/Customer Service &) IN TEXAS: 817-573-4111

✓214

TM INTERNATIONAL BUSINESS MACHINES INC.

notebook. The manual contains a brief overview of the system followed by a detailed description of each of the main menu options. It includes machine-specific instructions to back up and format Checkbook disks when you first start to use the program.

Checkbook comes with a subsystem of DOSPLUS called TDOS; the TDOS manual is included in the documentation for those unfamiliar with DOSPLUS.

Initializing the program is simple on the Model III/4: You simply back up the Checkbook disks and begin work. On-screen help is available by typing in an asterisk at any command prompt throughout the program. This brings you back to the main menu, where you select the Help option for the program section that's giving you trouble. The disk includes sample data so you can learn by using the system.

Using Checkbook Plus

When you're ready to set up your own checkbook, assign your checking account a three-letter code that will uniquely identify it. This code remains current until you select a new one. You can store more than one checkbook register per disk and you can move from one register to another without exiting the add mode.

When entering transactions, you work one month at a time. To change months, you make a menu choice and specify a new month number.

It's a good idea to select the starting number for your checks, since Checkbook Plus automatically increments the check number as you draw a new check. But you can override this convenient feature should you need to enter checks out of sequence.

You can check your balance from the main menu and you can manually change the amount, if necessary.

Before you start to draw checks, you have to enter the account names and numbers in the program; you're allowed up to 30 characters for the account name, and up to three digits for the account number. You can enter both expense and credit accounts, and you can group them logically according to your needs. You can also edit and delete any mistakes.

I was disappointed in the way Checkbook Plus handled the mechanics of data entry in the different sections of the program. After entering a

*If you have fixed
monthly expenses, you
can set up Checkbook
for automatic payment.
It will print your
checks on set dates.*

new account, you press a key to verify that it's correct. Then you have to press another key to continue (taking you back to the account menu) and yet another key to add an additional account. The middle step here seems completely unnecessary. Pressing the key to verify entry should automatically take you to the menu. Better still, you could eliminate the third step as well, designating an escape key to exit the program.

If you use a printer to write checks (using Checkbook Plus's Rapidforms, catalog number 2847), you should next enter the payee name and address. Checkbook Plus will print them so that you can use the checks with window envelopes.

If you have fixed monthly expenses, you can set up Checkbook for automatic payment. It will print a check to the payee you specify on a set date.

After these preliminaries, you enter your transactions. For each check,

type in the date, payee, category, short comment, amount, and long comment. After you enter the date once, it remains the default until you change it. If you type any new digit in the date field, Checkbook erases the entire date. For example, in order to change the date from 06/06/84 to 06/07/84, you have to retype the whole date. Checkbook Plus's programmer should at least have left the year as a default when you change the day.

You enter the account number to which you want to assign expenses in the Category field. It allows a short comment of up to 15 characters, and up to 270 characters in the long field. However, the long comments wrap around on printouts and spoil the appearance of the report.

After each transaction, you may approve, cancel, edit, or add another. I found the edit function convenient because you don't have to retype the entire transactions when correcting errors. As Checkbook displays each line, pressing the enter key retains the old data; alternatively, you can type in new data.

I noticed a serious bug in this section of my review copy. The check amount wouldn't display correctly. If you pressed the enter key to accept the amount of a check, the program booted back to Basic. The manufacturer has since corrected this bug and new copies don't have the same problem. Owners of the bugged software can upgrade free.

Checkbook's More option is for a check or deposit you want divided among more than one account. For instance, say you write a check to the grocery store for \$68.75, of which \$19.89 is household expense and the rest food expense. For such a transaction, you should keep a calculator handy (which seems a little ridiculous to me since you're working with a computer). To enter the above transaction, you have to manually subtract the \$19.89 from \$69.75, then enter the two accounts as separate transactions. Later, when you print out the transaction, Checkbook Plus totals it, but it isn't totaled on-screen as you work. It would be easy to make a mistake so that the total doesn't add up to the actual amount of the check.

Canceling checks is easy and best of all, you can correct any mistakes.

Continued on p. 125

Checkbook Plus



H&E Computronics
50 N. Pascack Road
Spring Valley, NY 10977
Models I, III, and 4
\$100

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

CONVERT MOD III BASIC MOD 4 IBM PC TANDY 2000

If you own a TRS-80 Mod III and have resisted upgrading to the TRS-80 Mod 4, IBM PC, or Tandy 2000 because your software would not be compatible, good news has finally arrived. EMSI offers 3 powerful utilities for converting your Mod III BASIC programs to run on any of these new machines.

The programs are menu driven, very easy to use and automatically translate 95% or more of even your largest BASIC programs in just a few minutes. They insert all required spaces between keywords, recalculate PRINT@ addresses (or replace them with LOCATEs), adjust TAB addresses, correct exponentiation symbols, eliminate unnecessary spaces, remove down arrows, optionally remove REM's, and flag and list unresolved line numbers. User guides explain program operation in complete detail, offer alternatives for revising lines that need manual intervention and numerous hints for easier, more thorough conversions.

CONV3TO4 Converts TRS-80 Mod III BASIC to **\$ 49.95**

TRS-80 Mod 4
Hundreds of satisfied users. Ask to see program review (three stars) at your local Radio Shack Computer Center.

CONV3TOPC **NEW!** Converts TRS-80 Mod III BASIC to IBM PC* **\$139.95**

CONV3TO2000 **NEW!** Converts TRS-80 Mod III BASIC to Tandy 2000* **\$139.95**

*Includes convenient diskette formatter and file transfer program so that programs and files may be exchanged between machines without modems. Diskettes and guides are packaged in deluxe three ring binders. User Guides available separately for those who want complete details before ordering entire package (\$5.00 cash or MO only, credited to subsequent package order).

TO ORDER, CALL NOW — TOLL FREE (Except NJ)

800-922-0786

NJ residents, and local dealers: 201-879-5982

✓85

EDUCATIONAL MICRO SYSTEMS, Inc.

P.O. Box 471, Chester, New Jersey 07930

DEALER INQUIRIES INVITED

Terms: VISA, Mastercard, MO, check, or COD. Orders shipped within 24 hrs. Add \$3.00 shipping/handling. Add \$1.65 for COD. Foreign or first class, add first class postage (package wt. 2 1/4 lbs.). NJ residents add 6% sales tax.

70 INCOME TAX PROGRAMS

(For Filing by April 15, 1985)

TRS-80* Models I, II, III, 4, 12 & 16

FEATURES: —

1. Menu Driven.
2. "Save on Disk"
3. BASIC, Unlocked, Listable
4. Name SS No. F-S carried over
5. Inputs on screen before printing
6. I.R.S. approved REVPROC format printing
7. Prints entire Form Schedule
8. Calculates Tax etc.
9. For Mod III 4, CONVERT
10. For Mod 12 16, use 2 0b
11. Use GREENBAR in Triplicate — don't change paper all season!
12. Our 6th Year in Tax Programming
13. We BACK-UP our programs!

For the Tax Preparer, C.P.A., Lawyer and Individual. 70 Tax Programs on 12-5 1/4" Format disks, or on 3-8" Format disks. Order only the disks you'll use.

Programmed for easy-use. Follow the Form or Schedule closely. Check-points along the way. Results on screen before printing.

70 TAX PROGRAMS include: Forms 1040, 1040A, 1120, 1120S, 1065 and 1041 Schedules A, B, C, D, E, F, G, R, SE and W Forms 1116, 2555, 2106, 2119, 2210, 2440, 2441, 3468, 3800, 3903, 4136, 4137, 4255, 4562, 4684, 4972, 4797, 5695, 5884, 6251, 6252 and 6765.

Also we have TAX PREPARER HELPER includes 12 PROGRAMS such as INCOME STATEMENT, RENTAL STATEMENT, SUPPORTING STATEMENT, IRA, ACRS, 1040 ES, ADD W-2's, PRINT W-2's and others.

5 1/4" disks at \$24.75; 8" disks at \$99 Postpaid. Tryout disks available.



Write:—

GOOTH TAX PROGRAMS

✓185

931 So. Bemiston • St. Louis, Mo. 63105

*T.M. Reg. by Tandy Corp. Ft. Worth, Tx.

EXPAND TRS-80 MEMORY

TRS-80 to 16K, 32K, or 48K

**Model 1 = From 4K-16K Requires (1) One Kit
Model 3 = From 4K-48K Requires (3) Three Kits
Color = From 4K-16K Requires (1) Kit

**Model 1 equipped with Expansion Board up to 48K Two Kits Required
— One Kit Required for each 16K of Expansion —

TRS-16K3 200ns for Color & Model III. . . \$8.95

TRS-16K4 250ns for Model I. \$6.95

TRS-80 Color 32K or 64K Conversion Kit

Easy to install kits come complete with 8 ea. 4164-2 (200ns) 64K dynamic RAMs and conversion documentation. 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-64K2. \$38.95

NEW! TRS-80 Model IV 64K or 128K Conversion Kit

Easy to install kit comes complete with 8 each 4164 (200ns) 64K dynamic RAMs and conversion documentation. Converts TRS-80 Model IV computers from 16K to 64K. Also expands Model 4P from 64K to 128K.

TRS-64K2. \$38.95

(Converts the Model IV from 16K to 64K or will expand the Model 4P from 64K to 128K)

TRS-64K2PAL (Model IV only). \$59.95

(8-4164's with PAL Chip to expand from 64K to 128K)

DIP/IC INSERTER/EXTRACTOR TOOLS

MOS-1416 (Inserts all above RAM pkgs. 14/16 pin). . . **\$10.95**

EX-1 (Extracts 8-24 pin pkgs.). **\$ 2.49**

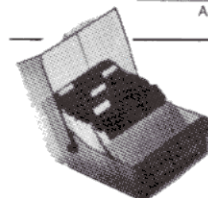


5 1/4" Diskettes
SSDD = Single Sided Double Density
DSDD = Double Sided Double Density

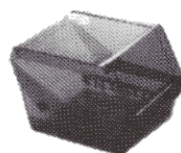
ULTRA MAGNETICS

Part No.	Description	Boxed	Price
UM51401	SSDD with Hub Ring	10	\$24.95
UM52401	DSDD with Hub Ring	10	\$33.95

All diskettes are soft-sectored and have hub rings.
Bulk prices available on request.



DISK MINDER



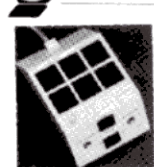
• Attractive, functional disk storage system • 36 (3", 3.25" and 3.5"), 50 (8") or 75 (5 1/4") disk storage capacity • Easy filing and retrieving • Protects disk from dust contamination • Molded from durable smoked plastic with front carrying handle • Size (DM36): 8 3/4" L x 5 1/2" W x 4 1/4" D • Size (DM50 & DM75): 7" W x 6 1/2" H x 9 1/4" D • Weight: 2 lbs.

Part No.	Description	Price
DM36	Stores 36 (3", 3.25" and 3.5") Diskettes. . .	\$19.95 ea.
DM75	Stores 75 (5 1/4") Diskettes.	\$19.95 ea.
DM50	Stores 50 (8") Diskettes.	\$29.95 ea.

We also specialize in integrated circuits, custom cables, power supplies, keyboards, and much, much more!
Give us a call today!

INDUSTRIES

Protect Yourself..



DATASHIELD® Surge Protector

Eliminates voltage spikes and EMI-RFI noise before it can damage your equipment or cause data loss. Six month warranty.

Model 100. \$69.95

DATA SHIELD® Back-Up Power Source also available.
Protect your TRS-80 Model computers.

PC200 (200 Watt Rating). \$299.95

XT300 (300 Watt Rating). \$399.95

\$10.00 Minimum Order — U.S. Funds Only
California Residents Add 6 1/2% Sales Tax
Shipping — Add 5% plus \$1.50 Insurance
Send S.A.S.E. for Monthly Sales Flyer!

Spec Sheets — 30¢ each
Send \$1.00 Postage for your
FREE 1985 JAMECO CATALOG
Prices Subject to Change



**Jameco
ELECTRONICS**



1355 SHOREWAY ROAD, BELMONT, CA 94002
Phone Orders Welcome (415) 592-8097 Telex: 176043

✓534

THE GW DIFFERENCE

by Jim Heid



Basic differences explained—what Model I/III/4 and Color Computer programmers need to know to write GW-Basic code.

T

he Model 1000's DOS and hardware may be alien territory to most veteran TRS-80 users, but its Basic programming environment is familiar turf. Microsoft's GW-Basic is essentially an expanded version of TRS-80 Basic rather than a brand-new language. That means you can easily convert most of your

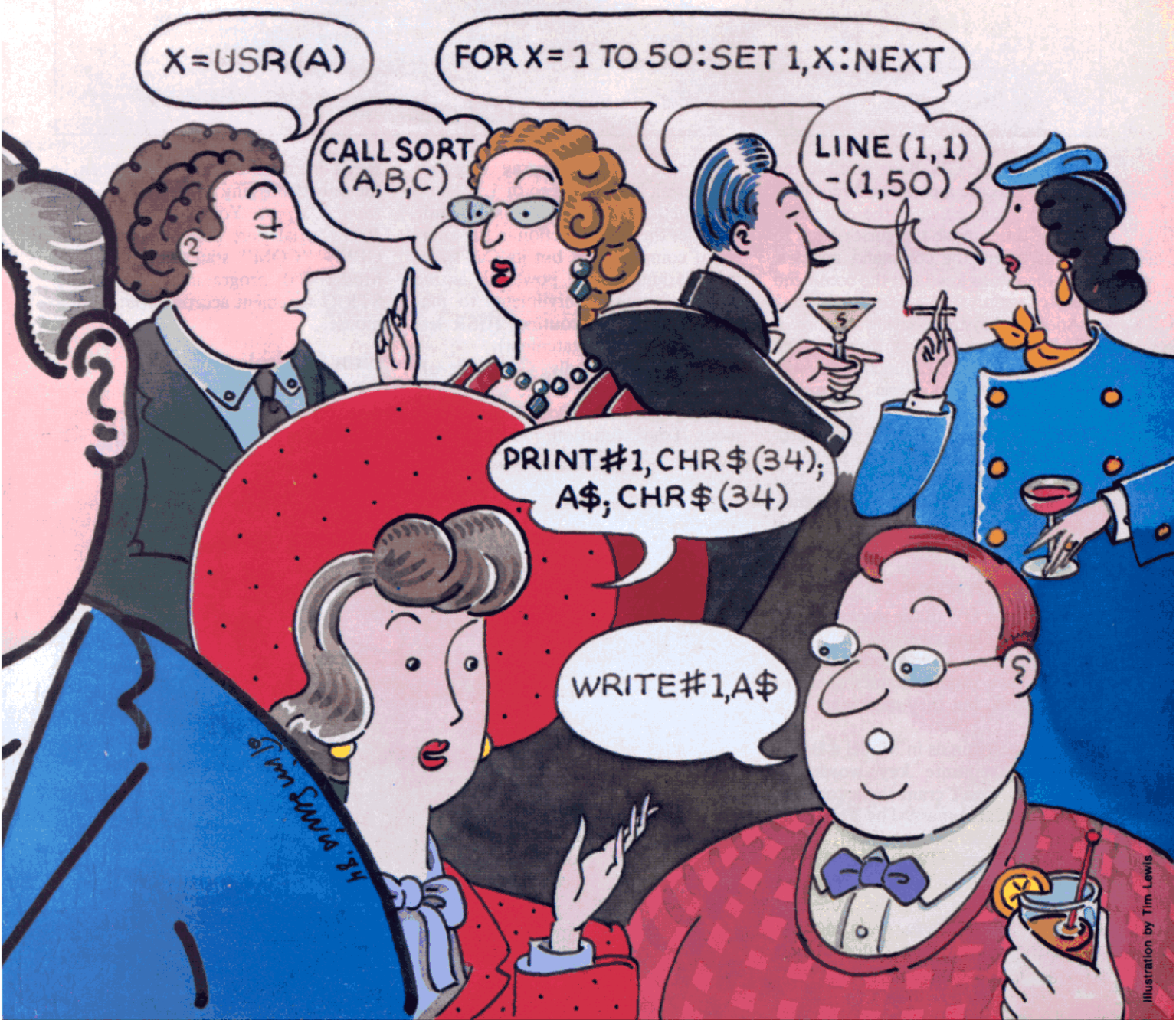
Model I/III/4 and Color Computer programs to run on the Model 1000.

In this article, I'll take a brief look at GW-Basic's main features, spotlighting functions that may be new to the Model I/III/4 or CoCo programmer. I'll also give you some guidelines for converting traditional TRS-80 Basic programs to the Model 1000's GW-Basic format. (For an introduction to GW-Ba-

sic on the Model 2000, see "A Better Breed of Basic," July 1984, p. 94.)

GW-Basic is compatible with IBM's Advanced Basic, even though GW-Basic resides entirely in RAM on the Models 1000 and 1200. The IBM PC's Basic is partly ROM-based, like Radio Shack's Model I/III Basic.

When you enter GW-Basic, the first thing you notice is its full-screen editor. No more agonizing over TRS-80 Basic's single-line editor with its Hack-and-Insert, Extend, and Search-and-Kill commands. To edit, you simply type in new text over the old. For major changes, use the insert and delete keys. You can even change line numbers by typing in the new number over the old one and pressing the enter key. Duplicating program lines is a snap.



ABS	DATA	GET	LPRINT	POKE	STICK
AND	DATES	GOSUB	LSET	POS	STOP
ASC	DEF	GOTO	MERGE	PRESET	STR\$
ATN	DEFDBL	HEX\$	MID\$	PRINT	STRIG
AUTO	DEFINT	IF	MKD\$	PRINT#	STRING\$
BEEP	DEFSNG	IMP	MKIS	PSET	SWAP
BLOAD	DEFSTR	INKEY\$	MK\$	RANDOMIZE	SYSTEM
BSAVE	DEF FN	INP	MOD	READ	TAB
CALL	DEF USR	INPUT	MOTOR	REM	TAN
CDBL	DELETE	INPUT#	NAME	RENUM	THEN
CHAIN	DIM	INPUT\$	NEW	RESET	TIMES\$
CHRS	DRAW	INSTR	HEX\$	RESTORE	TO
CINT	EDIT	INT	NOT	RETURN	TROFF
CIRCLE	ELSE	KEY	OCT\$	RIGHT\$	TRON
CLEAR	END	KILL	OFF	RND	USING
CLOSE	EOF	LEFT\$	ON	RSET	USR
CLS	ERASE	LEN	OPEN	RUN	VAL
COLOR	ERL	LET	OPTION	SAVE	VARPTR
COM	ERR	LINE	OR	SBN	VARPTR\$
COMMON	ERROR	LIST	OUT	SCREEN	WAIT
CONT	EXP	LLIST	PAINT	SGN	WEND
COS	FIELD	LOAD	PALETTE	SIN	WHILE
CSRLIN	FILES	LOC	PALETTE USING	SOUND	WIDTH
CSNG	FIX	LOCATE	PEEK	SPACE\$	WRITE
CVD	FN	LOF	PEN	SPC	WRITE#
CVI	FOR	LOG	PLAY	SQR	XOR
CVS	FRE	LPOS	POINT	STEP	

Table. GW-Basic's reserved words.

You can use GW-Basic's full-screen editor to execute a command repeatedly. After Basic executes the command the first time, move the cursor back to the line where the command appears, press the return key, and the command executes again.

Another keystroke-saving feature is GW-Basic's function key support. Ten of the Model 100's 12 function keys are preset to common Basic commands such as Run, List, Save, Load, and CONT (continue). And you can reprogram each function key with up to 15 characters. The screen display's 25th line shows current key assignments. Function key support works within Basic programs, too.

Language Overview

Here's how GW-Basic stacks up as a programming language:

Variable names: As in Model 4 Basic, you can have variable names of up to 40 characters, but they must start with a letter.

Key words: Again as in Model 4 Basic, you must separate key words by spaces. You can't cram them together in an unreadable mass. The Table lists GW-Basic's reserved words.

Data structures: GW-Basic provides integer, single-, and double-precision numeric variables with the same accuracy as TRS-80 Basic. As in Model 4 Basic, the Option Base statement lets

you specify whether array subscript numbering begins at zero or 1.

Machine-language support: GW-Basic provides the USR function in the interest of compatibility, but its Call statement is much more powerful, letting you pass multiple arguments to machine-language subroutines (USR lets you pass only one statement).

Debugging aids: Sadly, GW-Basic offers nothing special in the way of debugging aids. Microsoft Basic's infamous Trace function, which simply

spews line numbers across the screen, is the only debugging aid provided.

Input/Output: You can adjust the 1000's serial port parameters with an OPEN "COM" statement, much as Model 100 programmers can. The STRIG statement accepts input from a mouse.

Firm Control

GW-Basic offers some exciting control structures. Beside the usual GOTO, On...GOTO, and On...GO-





SUB statements, it has event-trapping capabilities and a While...Wend structure.

Event-trapping statements call a program subroutine when a predefined event occurs. The On Key statement shunts program execution when you press a function or cursor key. ON COM branches program flow when the computer detects data entering the serial communications port. ON STRIG transfers execution when you press a mouse button, and On Error redirects the program when an error occurs. On Error is the only event-trapping TRS-80 Basic provides, except for Model 100 Basic, which can detect serial communications events with its ON COM structure.

GW-Basic's event-trapping features make programs more responsive. For instance, you can use On Key to branch to a help routine when you press a specific function key. ON COM lets you write communications programs that go into action as soon as they detect incoming data at the serial port. ON STRIG allows input from a mouse, opening the door to games and other applications, even to that MacPaint clone you always knew you could write.

While...Wend executes a portion of a program repeatedly as long as the expression following the While statement is true:

```
10 WHILE COUNT < 5
20 PRINT "Count now equals:";COUNT
30 COUNT = COUNT + 1
40 WEND
```

This program displays the contents of the Count variable until its value reaches 5, at which time the While...

Wend loop ends and execution continues with the first statement after Wend.

Saluting the Colors

With 16 colors and up to 640- by 200-pixel resolution, the Model 1000 is a fine graphics machine. GW-Basic offers a rainbow of graphics statements; in fact, Color Computer programmers will probably feel more at home with them than Model I/III/4 programmers.

For starters, there's a Color statement that lets you set the foreground (text) and background colors. The statement COLOR 6,1,0, for example, produces yellow characters on a blue background, with a black border around the screen. The Color statement also works in graphics mode, where its first argument specifies the background color and its second denotes the current palette. A palette comprises a group of eight colors; the Model 1000 can display up to 16 colors, but only eight at a time.

Like the CoCo's Extended Color Basic, GW-Basic includes statements to draw lines, boxes, and circles. The Line statement draws a line between two specified points, and also draws hollow or filled boxes. The Circle statement draws circles and ovals.

The Draw statement lets you draw shapes. The statement DRAW "L40 E20 F20" draws a triangle— "L40" means move left 40 points; "E20" means move diagonally up and right 20 points, and "F20" means move diagonally up and left.

What makes Draw really powerful, however, is that you can put its arguments into a string variable, then execute the variable. Using the example above, first assign the commands that draw a triangle to a string variable:

```
10 TRIANGLES = "L40 E20 F20"
```

Then, anywhere in your program, draw a triangle with:

```
50 DRAW "XTRIANGLES"
```

The X that precedes the variable name tells the Draw statement to execute the contents of the string variable that follows. Finally, Draw has many optional parameters for specifying color, scale, movement without drawing, and more.

The Get and Put statements normally used with direct file access also have graphics applications in GW-Basic, as they do in Extended Color Basic. By

specifying two sets of horizontal and vertical coordinates, you can store a square or rectangular area of the screen in an array using the Get statement. You can then display that area anywhere by using the Put statement followed by the coordinates of a point on the screen.

The Put statement has several modes that make it especially valuable for animation. Its And mode draws an image only if an image already exists at those points. The Or mode superimposes an image onto an existing one, while the XOR (Exclusive-or) mode inverts the points on the screen where one exists in the array. XOR also lets you move an object without erasing the background.

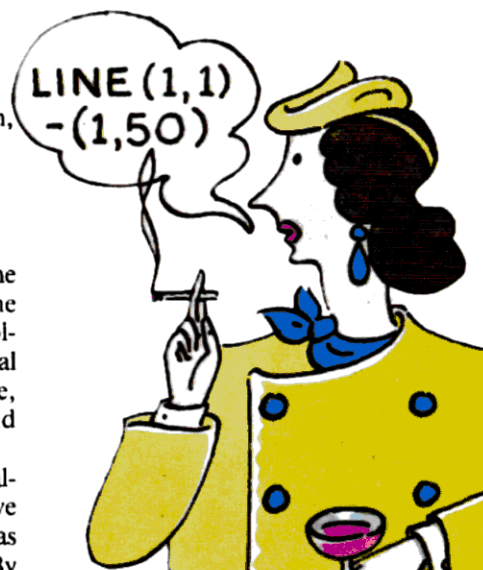
The Paint statement fills an enclosed area with color, given the starting coordinates (and given enough memory; the more complex the area to fill, the more memory required). PSET and Preset turn on and off, respectively, specific points on the display.

Display Formatting

Gone, thank goodness, is Print@. Instead, GW-Basic's Locate statement positions the cursor according to row and column coordinates. For example, the statement LOCATE 12,1 positions the cursor at row 12, column 1. Programming complex displays with Locate is much easier than with Print@, because you don't have to keep referring to the video display worksheet to find out where position 384, for example, really is.

Sounding Off

GW-Basic supports the 1000's sound-generating capabilities with Beep, Sound, and Play statements.



Beep does just what you'd expect: causes a fixed-pitch beep. The Sound statement produces a specified tone for a specified time; you can use it for sound effects or to play music.

The Play statement is for serious music programming. Rather than using arbitrary numbers to specify pitch (like the Sound statement), Play lets you specify musical notes over seven octaves, including sharps (denoted by a # sign) and flats (represented by a minus sign). You can specify whole, half, quarter, eighth, and sixteenth notes, as well as their dotted counterparts, and you can regulate tempo.

The Play statement has two interesting features. First, you can store notes in a string variable, then execute the variable, as in the example above using the Draw command.

Second, you can specify foreground or background music. In foreground mode, GW-Basic doesn't execute any other statements until the Play routine has ended. In background mode, Basic stores the music (up to 32 notes or rests) in a buffer, then resumes program execution while the notes play.

Background mode can be especially valuable in game programming: The game doesn't have to stop every time a musical sequence plays.

Disk File-Handling

Not much is new in the disk file de-

partment. GW-Basic supports both sequential- and direct- (random-) access file input/output, with variable record length files permitted under the latter mode. You have up to 15 disk file buffers available, and you access them with the same statements (PRINT#, INPUT#, LINE INPUT#, Get, and Put) used in TRS-80 Basic.

You do get two amenities not found in I/III/CoCo Basics. The Write# statement writes data to sequential files properly delimited with commas and quotes, eliminating the hassle of remembering all those CHR\$(34) and "," sequences. Also, the Print# Using function lets you format the data you're writing to sequential files.

Conversion Considerations

"Okay," you say, "GW-Basic is the best thing since keyboard debounce. What about my Basic space shuttle simulator? Will it run on the new computer?"

That depends on a number of factors. The Model 1000 can't read Model I/III/4 or CoCo disks, so you'll have to transmit your existing programs using the machine's serial ports.

You can't transfer Basic programs that contain any machine-language subroutines: Z80 and 8088 machine language are as different from each other as the Model 4 is from the Model 1000. You'll have to convert all Z80

machine code to 8088 code to get programs to run on the 1000. Similarly, existing programs will balk if they contain any PEEKs or POKEs to memory locations specific to a particular machine.

Also, you have to change any programs that use graphics. You'll want to take advantage of the Model 1000's improved resolution and color and GW-Basic's battery of graphics statements. Replace complicated, slow For...Next loops that draw lines and circles with Line and Circle statements. Instead of TRS-80 graphics characters, use GW-Basic's Draw statement to draw shapes. Use the Get and Put graphics statements for fast animation and the Paint statement to fill areas with color.

Eliminate Print@ statements—use Locate instead. You may want to replace key-scanning Inkey\$ routines with GW-Basic's On Key control structure. While...Wend can replace For...Next loops and routines that increment or decrement a variable over and over.

Disk file access routines require no modification. However, remember that the Model 1000 disk drive specifier is a letter, not a number, and it goes before the file name (A:file name, not file name:1).

Summary

What's lacking in GW-Basic? Its debugging aids could be better. The only run-time debugging feature is the awful Trace function. Features that would let you monitor the contents of variables and trace program execution without destroying screen displays would help.

That weakness aside, GW-Basic represents one of the better versions of Basic. Its full-screen editor makes typing in and modifying programs easy instead of torturous, its event-trapping features allow for responsive programs, and its graphics statements let you take full advantage of the Model 1000's fine graphics capabilities.

Last but not least, because it's Microsoft Basic, you don't have to learn a whole new language. You'll just have to learn GW-Basic's "gee-whiz" features. And you'll enjoy that. ■



Jim Heid is a freelance writer and the author of a book on Basic programming forthcoming from Ashton-Tate. Contact him c/o 80 Micro, 80 Pine St., Peterborough, NH 03458.

(LISP)

Artificial Intelligence Language UO-LISP Programming Environment The Powerful Implementation of LISP for MICRO COMPUTERS

Excellent for Learning the Preferred Language
of the Artificial Intelligence Community



This POWERFUL subset of the CP/M based UO-LISP supports, the usual LISP Interpreter Functions, Data Types, LISP Structure Editor, Optimizing LISP Source Code Compiler & Assembler, Assembly & LISP Code Intermixing, Compiled Code Library Loader, Numerous Utility Packages, Comprehensive 150 Page Manual, the High Level Language RLISP, and much more.

TURN YOUR TRS-80 INTO A REAL LISP MACHINE FOR ONLY

\$49.95

Above configuration supported on TRS-80 Model I & III running with TRSDOS or any of the TRSDOS compatible systems (send for catalog list), 48K and dual drives and on Model 4 & 4P with Model III TRSDOS.

TO ORDER: Send request for **UO-LISP Model I, Model III, or Model 4/III** with check, money order, or credit card no. with exp. date, add parcel shipping fee of \$3.00 inside U.S. and CN., \$10 outside U.S.

NEW CP/M configuration available on TRS-80 Models II, 4, 4P and modified Model III with Holmes VID-80 + CP/M option. Write for your **FREE CATALOG** with details and order forms for CP/M support.

VISA and MasterCard

✓95

Northwest Computer Algorithms

P.O. Box 90995, Long Beach, CA 90809 (213) 426-1893

New from PowerSOFT! Now Copy files From TRS-80 to PC/MS DOS or CPM and BACK with SuperCROSS/XT!

Did you just get a new Model 1000, 1200, or PC? How about CP/M? Just get that? Now with SuperCROSS/XT you can COPY your files TO or FROM 70 different DOS formats direct disk to disk! You can also FORMAT an alien disk, display the DIRECTORY, or KILL files. Fully MENU driven with plenty of on-line HELP available! Very easy to operate in today's computer environment, especially for non-programmers.

GREAT new features that make SuperCROSS/XT the transfer system of choice:

"FOREIGN-TO-FOREIGN" file transfers for the first time!! No longer a two step operation! Setup two different DOS formats in two different drives ala SU+ for COPYing files back and forth.

MASS FILE TRANSFERS! Now features a new TAG feature which allows you to "mark" any number of files for COPYing or KILLing!

CONFIGURE for the DOS you COPY from most, for faster automatic startup time!

SKIP command for reading or writing a 40 track disk in an 80 track drive!

PowerSOFT presents the **state-of-the-art file transfer program** for use on the TRS-80! SuperCROSS/XT is designed to allow you to move DATA and program files freely between your own TRS-80 and DOS formats or other computers. You can now do this with SuperCROSS/XT and your existing hardware, eliminating modems, wires, and terminal program transfers. SuperCROSS/XT runs as a /CMD file under your TRS-80 operating system and will allow you to COPY files back and forth between different operating systems. You may format on a foreign disk in your TRS-80 and COPY files to it that can be read by, for example a Model 1000, a KAYPRO or an IBM PC. Note that machine language programs, although transferable, will NOT run due to the difference in microprocessor chips used in the different machines.

You can copy BASIC, PASCAL, FORTRAN, C, or other high level language programs, and run them with little modification, unless they make extensive use of graphics, or have machine language calls. CNVBASIC/CMD, available separately, will make most of the syntax and spacing changes required for converting Model/III BASIC programs for use on other systems. Data files, spreadsheet files, and text files can also be usefully moved between machines. If you use or have the same Visicalc or Multiplan on the TRS-80, you can use the same files on other machines! These spreadsheet files are directly convertible to 123 and other calc-type programs. Of course, the combinations and possibilities are endless, and the flexibility is ALL there with SuperCROSS/XT!

DOS Formats Supported: MS-DOS variations include MS-DOS 1.0, 2.0/2.1 single or double-sided (IBM and most compatibles), and Tandy 2000. CP/M variations include most well known single and double-sided formats including Tandy's 3.0+, Montezuma Micro 2.2 (all versions), Holmes and 60 others including: ALTOS, CROMEMCO, DEC, EAGLE, EPSON, HP 125, CP/M 86, KAYPRO, LNW-80, LOBO MAX-80, MORROW, NEC, OSBORNE, OTRONA, SANYO, SUPERBRAIN, TELETEK, TELEVIDEO, TRS-80, LIFEBOAT/I, OMICRON/I, HOLMES/3, HURRICANE COMPACTOR/3, SHUFFLE BOARD/3, XEROX, ZENITH-HEATH, and 8" standard CP/M. *Of course double-sided drives are required for reading DS disks. Use SS for transfers, if needed.

If you use another computer besides your TRS-80 at work or home—you need SuperCROSS/XT so call or write, but order today! Only \$99.95. Check, VISA/Mastercard or COD accepted. Please add \$3 for shipping/handling (\$2 additional for COD). Foreign orders please add \$10 for AIRMAIL.

SuperCROSS/XT \$99.95
(Please specify Model I-DD/III, 4/4P, or MAX-80 version)
CNVBASIC/CMD (CONVERT BASIC for Mod I/III/4) \$29.95
Converts I/III BASIC programs for use on MS-DOS, CP/M, or Mod 4!
If ordered WITH SuperCROSS get BOTH programs
for only \$119.95

PowerSOFT

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

All trademarks are the properties of the companies represented.

✓306

• Outputs:

DIS&DATA

Now for

The Model 4!

The *Only*

Disassembler

That Even Tracks Down

DATA!!!



- AUTOMATICALLY identifies such data areas.
- Outputs fully-labeled Radio Shack* or APPARAT** EDTASM* source code to display, printer, disk (and cassette -- Models I/III only).
- Can relocate itself to any free RAM area.
- Loads programs from disk (or cassette -- Models I/III only) and displays entry point.

*For TRS-80 Model I (Level II), Model III, or Model 4 (in Model III mode or under TRSDOS 6.0, in Model 4 mode).

#1354-42 (Model 4 diskette, TRSDOS* 6.0) \$49.95
#1354-22 (Model III/4 diskette, TRSDOS* 1.3) \$39.95
#1354-12 (Model I/III cassette) \$36.95

* Registered Trademark, Tandy Corporation

** Registered Trademark, APPARAT, Inc.

U.S. Funds Only. Add \$2.00 shipping (U.S. & Canada), \$5.00 (overseas air) per item. Ohio residents please add 6% sales tax.



To order, phone (513) 435-4480 (M-F, 9 a.m.-5 p.m. EST), or send check, money order or VISA/MasterCard information (name, address, card number, expiration date, and your telephone number) to:

PRO/AM SOFTWARE

220 Cordogan Road
Centerville, OH 45459 ✓260

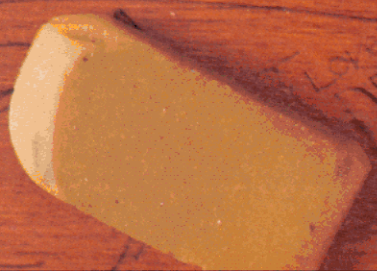
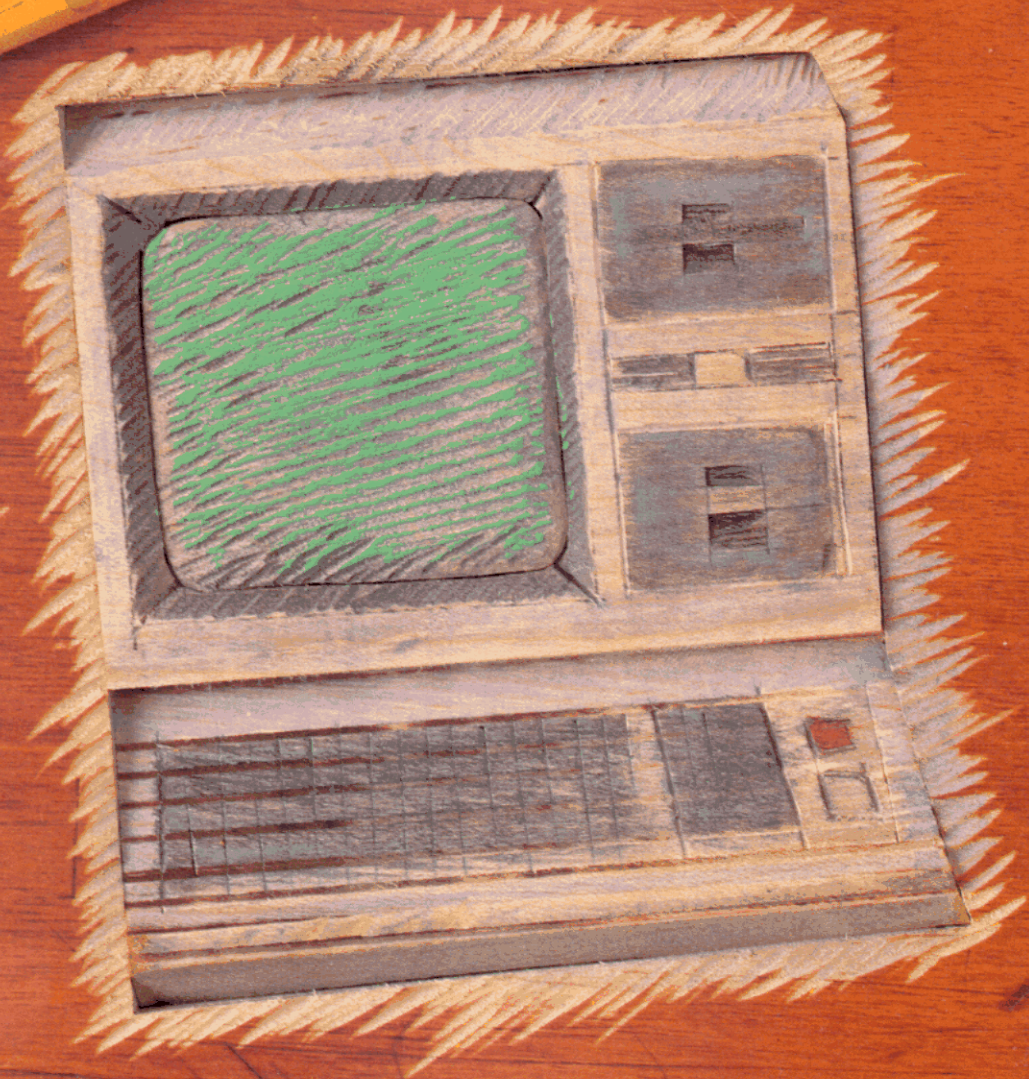
Professional Software for
both Novice and Expert



64K



DIR



Young Programmer's Awards 1984-85



80 *Micro's* Young Programmer's Contest is now three years old. During this time, we've seen hundreds of entries from across the country and around the world. To all who entered, we salute you!

The Judging

It's not easy to judge a contest with so many outstanding entries. *80's* technical staff had to consider many factors in evaluating these programs. The main criteria were: *Originality*. Was the program concept new? Did it present a unique twist to a familiar application?

Documentation. We wanted docs that would easily lead the user through the program, telling him what he needed to know to run the program and anticipating any questions he might have.

Programming elegance. We examined the programming techniques used: Did the program incorporate advanced commands? Were shortcuts used to bypass conventional program flow? How good was the overall programming logic? Were there helpful comments in the listings?

Error-trapping. Could a user easily subvert or crash the program? How well was user input defined? Were there any logic mistakes made in programming?

Usefulness. Would we use the program or technique in our own programs? Did we have fun with the games?

And the Winners Are...

Our Grand Prize winner is 18-year-old Michael Leibow, with his full-screen Model III graphics editor. Graph, written in machine language with Basic modules, can draw and manipulate screens in a variety of ways. You can mix screens with any of three different backgrounds, extract portions of a design for use elsewhere on the screen or in other pictures, rotate graphics up to 360 degrees, print the design in any of three sizes, and define pixel size to either elongate or flatten the printed image. The program can save to and load from disk or tape and supports both Epson and Radio Shack printers. *80* will publish Mike's program next month.

Fantastic Realms, written by Michael Lewicki and James Karls, won first prize in the 15-18-year-old category. A Model III interactive fantasy game similar to Dungeons and Dragons, Fantastic Realms offers five levels of difficulty and lots of chambers filled with monsters and treasures. It also had the most complete docu-

mentation of any of our entries, with game booklets included for each scenario.

Fourteen-year-old Jeff Reifman was the first-place 12-14-year-old winner for Graphix, a program that lets you design and edit pictures on-screen, save them to buffer or disk, and send them to a printer. You can combine individual screens and print out a composite drawing.

The youngest of our young programmers, 9-year-old Jeffrey Zare, won first place in the 11-and-under category with Number Eaters. The object of this Model III game is to gobble up any numbers lower than yourself, while avoiding higher numbers that appear randomly. Watch out though, or you'll get trapped by the killer Z's!

Herman Calabria's Adventure Generator was good enough to take second place in the 15-18-year-old category. This program lets you develop your own adventure games, complete with scenarios, characters, and game items.

Second prize in the 12-15-year-old category goes to Steven Whysong's Operator, a Model III bulletin board program that allows callers to send and receive public and private messages. Operator also contains an on-line Pilot interpreter for callers who want to program, save, and run Pilot programs.

Eleven-year-old Stephen Lardieri garnered second prize in the 11-and-under category for Drawarama, a machine-language graphics program with an option to add captions and print out your drawings. This Model III program came complete with help screens.

Transport, a Model III adventure graphics game that simulated the transport of goods by sea, won third place in the 15-18-year-old category for Christopher Healey.

Ken Buckley's simulation of a Turing machine on a Model III took third place in the 12-15-year-old category.

The first Model 4 program to win in our contest was Eric Mullenbruch's Conversion. This third-place finisher in the 11-and-under category is a menu-driven program for converting measurements (length, volume, weight, temperature, and liquid measure) from English to metric units and back again.

Honorable mentions go to the following: Lee Periolat, 11, for his 3-D Maze; Jeff Reifman, 14, for Gladiator, a machine-language adventure; Mariam Tariq, 14, for her Forms Management program; and Stacy Lamb, 17, for Concentration, based on the old TV show.

Congratulations to all our winners and our thanks to everyone who entered. ■

Monster Mashing

by Michael Lewicki and James Karls
15-18-Year-Old Category

Fantastic Realms is an interactive fantasy in the Dungeons and Dragons vein. You mastermind your war party's progress through a series of up to 70 chambers and hallways stocked with a daunting variety of monsters. There's treasure to be gained, of course, if you can survive your run-ins with the bad guys.

The game is complex and play can easily go on for days. You can choose from five scenarios of increasing difficulty. Screen graphics illustrate the dungeons; you move characters through them using the numeric keypad. Predefined commands advance the action.

What Goes on Here?

Take some time to read this documentation and become familiar with the game before you start to play. Otherwise, your party is liable to be wiped out during its first encounter with Kobolds or Orcs.

You create and control up to six characters that appear on the screen as the numbers 1-6 (see the Photo). A character's main goal is to gain experience points by killing monsters. When he has enough points, he can move up a skill level and increase his chances for survival by drinking a healing potion. On the down side, each time a character fights he risks losing hit points, which measure the injuries he can sustain before dying. Table 1 lists the experience and hit points for the first 10 levels. To reach each level beyond the 10th, you need an additional 250,000 points. A character's number of hit points increases by 10 at each successive level.

Monsters are everywhere, often in groups; fixed monsters stay in one room and guard treasure while wandering monsters can turn up anywhere. The game routines control the monsters, represented on the screen by letters of the alphabet (see the Photo).

Depending on your party's skill level, you can choose from five dungeons, or game scenarios. Table 2 lists the dungeons and recommended experience levels. Each dungeon has its own background story and assortment of monsters and treasures.

In the Lost Crown, for instance, you battle Orcs and Kobolds who are searching for an ancient crown believed to have been stolen by Wraiths. In Goblin's Magic Realm, your job is to kill off the few surviving members of the evil Goblin race. Chambers of Fortune pits your party against the Stone Giants, cunning creatures who terrorize neighboring towns. Subterranean Empire sets you loose in the kingdom of the wizard Valzar, whose army is bent on conquest even though Valzar is rumored to have died. Hallway of Death, chock-full of angry monsters, holds the treasure of the old magician Paritus.

The Programs

Fantastic Realms is actually a series of 20 programs that interact with each other. The game comes on two disks (see the box on this page for instructions on how to get the disks). The Fantastic Realms disk contains machine-language routines and the central Basic program; the Dungeons disk holds data for the five dungeons. In spite of its size and Basic components, the game runs like an all-machine-language program.

Six Characters in Search Of Treasure

You can run the game using one or two disk drives. If you have one drive, boot up the Fantastic Realms disk. You may be prompted to insert the Dungeons disk; if so, swap disks and press the enter key. If you have two drives, insert the Fantastic Realms disk in drive zero and the Dungeons disk in drive 1. On reset, you should see the game logo.

The game will ask if you want to create new characters. If you're playing for the first time, you must answer yes. Fantastic Realms saves characters to disk and you can recall them the next time you play.

You can create up to six characters. Their names may contain only the letters A-Z, without spaces; Fantastic Realms displays up to 20 letters on the screen, but saves only eight letters to disk.

The game randomly assigns your characters' strength and dexterity ratings from 3 (low) to 18 (high). These measure effectiveness against monsters.

Like any group bent on travel, your party goes shopping before heading for the dungeon. Each character has a supply of gold pieces to spend on protective

Because of Fantastic Realms' length and MULTIDOS-specific ROM calls, no program listing is provided. However, readers interested in obtaining a copy of the game should send two Model III MULTIDOS-formatted disks and a stamped, self-addressed return mailer to Mike Lewicki and James Karls; 5291 Old 22 Road, Gillett, WI 54124.

armor, weapons and arrows, and special items. Table 3 lists the types of armor available—don't leave home without it. The lower the armor class, the greater the protection it offers and the more it costs. It's wise to buy the best armor you can afford.

Table 4 lists weapons; a character can carry up to nine weapons. Cheaper weapons break more easily and tend to slip out of your hands in the heat of battle. Bows and arrows are for those times when you're not close enough to use another weapon; you can fire them from anywhere in a room. As with the other weapons, you get what you pay for: Deadlier bows cost more (see Table 5).

You haggle over price with a barterer. During the transaction, you can consult a list of available items by pressing the enter key without typing in an item number. If you want to buy a different type of equipment, press the zero key or type in NONE and you'll be able to choose another category.

If you want to add magic force to a weapon, add asterisks to its name. Magic force is rated from +1 to +3. AWL PIKE** means you want a +2 magic awl pike. Some magic weapons are unavailable at any price; you have to find them in the dungeon. They're indicated by an asterisk next to the weapon's name. The magic force can backfire, however, if your enchanted weapon becomes cursed.

Characters can also buy special items. A healing potion cures wounds; it costs 250 gold pieces times the experience level of the character buying it. Holy water is for throwing at undead monsters. A vial costs five gold pieces.

Dungeonward Ho!

Once your party is armed and ready for trouble, you choose a dungeon (see Table 2). Usually you enter through room 1, although in some dungeons you're transported to the middle of the dungeon. You can leave the dungeon to create new characters or buy more equipment only through room 1. When the game loads the dungeon, it asks if your party is reentering the dungeon. If you're continuing a game, answer yes.

On the screen, your party is a clump of numbers, one for each character (see the Photo). When Fantastic Realms displays a character's name and attributes in the upper left-hand corner of the screen, it's his turn to do something. You can move by pressing the appropriate key, give a command, or do nothing. If characters are in different rooms, each gets 10 turns; otherwise, the game rotates after every turn.

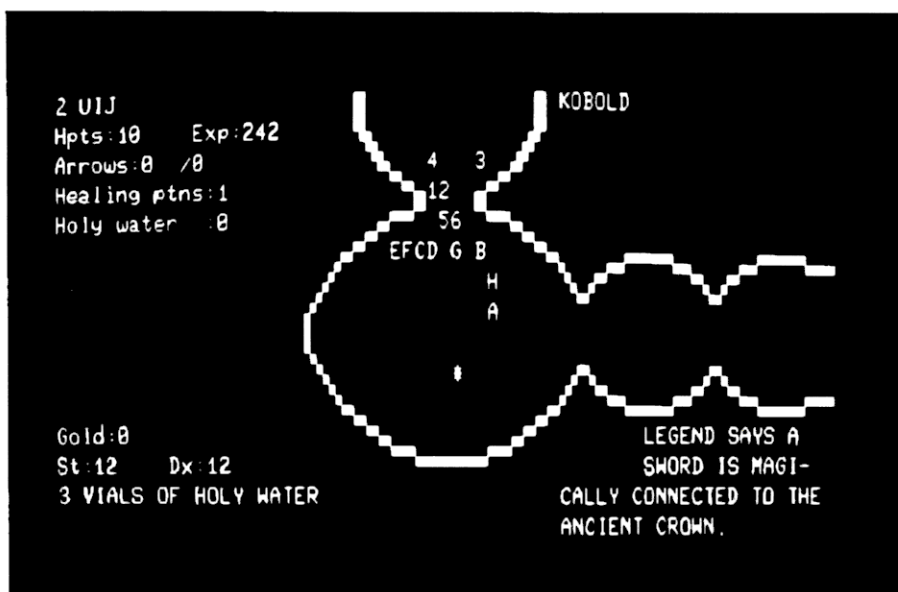


Photo. Screen display of a Fantastic Realms dungeon.

Level	Experience Points	Hit Points
1	0-1,999	10
2	2,000-3,999	20
3	4,000-7,999	30
4	8,000-15,999	40
5	16,000-31,999	50
6	32,000-63,999	60
7	64,000-127,999	70
8	128,000-249,999	80
9	250,000-499,999	90
10	500,000-749,999	100

Table 1. Experience levels.

Type	Avg. Cost	Class
Banded	90	4
Chain	75	5
Leather	10	8
Plate	400	3
Ring	30	7
Scale	45	6

Table 3. Armor.

Weapon	Avg. Cost
Composite Bow	100
Long Bow	60
Short Bow	15
Normal Arrow	1 (four arrows)
Magic Arrow	25

Table 5. Bows and Arrows.

Dungeon	Recommended Experience Level
Lost Crown	1
Goblin's Magic Realm	1-3
Chambers of Fortune	3
Subterranean Empire	5
Hallway of Death	8

Table 2. The five dungeons and recommended experience levels.

Type	Avg. Cost	Max. Damage
Awl Pike	3	12
Bardiche	7	12
Bastard Sword	25	16
Battle Axe	5	8
Bill-Guisarme	6	10
Broad Sword	10	8
Fauchard-Fork	8	10
Glaive-Guisarme	10	12
Long Sword	15	12
Morning Star	5	8
Retailor	80	25
Shocker	5,000	10
Short Sword	8	8
Spear	1	8
Trident	4	12
Two-Handed Sword	30	18
Voulge	2	8

Table 4. Weapons.

Command	Description	Command	Description
F	Fight	R	Rearrange weapons
N	Fire a normal arrow	P	Pick up dropped weapon
M	Fire a magic arrow	E	Exchange equipment
T	Throw a holy water vial	L	Look for secret passageways
G	Get the treasure	H	Drink a healing potion
W	List weapons	S	Save game

Table 6. Commands.

Name	Hit Points	Max. Damage	Armor Class	Movement	Attack Distance	Un-dead	Exp.
Ghoul	16	12	6	1	1	Yes	360
Gnoll	16	8	5	1	1	No	225
Hell Hound	40	10	4	2	3	Yes	600
Hobgoblin	9	8	5	2	1	No	175
Kobold	8	6	6	1	1	No	100
Lizardman	17	14	5	2	1	No	475
Ogre	33	10	5	1	2	No	480
Orc	8	6	6	1	1	No	100
Skeleton	8	6	7	1	1	Yes	100
Wraith	32	6	3	3	2	Yes	320

Table 7. Monsters of the Lost Crown.

Name	Hit Points	Max. Damage	Armor Class	Movement	Attack Distance	Un-dead	Exp.
Bugbear	25	8	5	2	1	No	300
Gargoyle	36	16	5	3	1	No	880
Gelatinous Cube	32	8	8	2	1	No	340
Giant Tick	16	4	3	1	1	No	135
Gnoll	16	8	5	2	1	No	230
Goblin	7	6	6	1	1	No	100
Hobgoblin	9	8	5	2	1	No	175
Kobold	4	4	7	1	1	No	50
Lemure	24	3	7	1	1	Yes	100
Manes	8	8	7	1	1	Yes	145
Ochre Jelly	48	12	6	4	1	No	780
Stirge	9	3	8	3	1	No	65
Toad	16	5	7	2	1	No	130

Table 8. Monsters of Goblin's Magic Realm.

Name	Hit Points	Max. Damage	Armor Class	Movement	Attack Distance	Un-dead	Exp.
Anhkheg	32	18	2	2	2	No	1,000
Ant	16	6	3	3	1	No	200
Badger	10	7	4	1	1	No	160
Centaur	32	12	4	3	2	No	610
Centipede	8	4	9	1	1	No	50
Ghast	32	16	4	2	1	Yes	820
Ghoul	16	12	6	1	1	Yes	360
Hell Hound	40	10	4	2	3	Yes	600
Leech	16	4	9	1	1	No	90
Mummy	41	12	3	1	2	Yes	710
Orc	8	8	5	1	1	No	160
Peryton	32	16	7	3	2	No	820
Shadow	20	4	7	3	1	Yes	130
Skeleton	8	6	7	1	1	Yes	100
Stirge	8	3	7	3	1	No	70
Stone Giant	75	18	0	2	3	No	1,840
Tick	24	4	3	1	1	No	170
Wasp	32	12	4	4	1	No	600
Wererat	25	8	6	2	1	No	295
White Dragon	48	24	3	5	5	No	1,990
Wight	24	4	5	3	1	Yes	165
Wolf	18	5	7	3	1	No	150
Zombie	16	8	8	1	1	Yes	205

Table 9. Monsters of Chambers of Fortune.

You use the numeric keypad to move a character; 8 represents north, 6 east, 4 west, and 2 south. To move all characters at once, press the shift key along with the appropriate number key (you can do so only if no monsters are in the room and no player in the room has moved).

Table 6 lists the commands that control characters' actions. Type in the letter only; don't press the enter key.

Characters can kill a monster in four ways: You can fight (F), fire a normal arrow (N), fire a magic arrow (M), or throw holy water (T). The game prompts you for the letter of the monster you're attacking. To fight, you have to choose a weapon and be close enough to attack; normal weapons can hit from two spaces away, magic weapons from four spaces, and wand weapons from eight spaces.

Tables 7-11 are field guides to the monsters that inhabit each of the five dungeons. Damage points tell you how much harm they can do; hit points and armor class indicate how hard they are to kill; attack distance tells you how close you must be to fight. The experience points you get for a kill vary with the monster's type. If a monster is undead, you can use holy water against it.

If a member of your party or a monster gets hit during a fight, an asterisk flashes over his position on the screen and his hit points are reduced.

You can see a list of your weapons without losing a turn (press the W key). Press the enter key to resume action. You can also rearrange your weapons' order (press R) or exchange weapons with another character (press E). If a character is near death, you might want to give his weapons to someone else; otherwise, when he goes, they go.

Other commands let you pick up a dropped weapon (press the P key), get a treasure (press G), look for secret passageways (press L), or drink a healing potion (press H).

Always save the game by typing in S when you're ready to stop. Don't ever press the reset button or turn off the computer during disk access. And don't ever turn your back on a Hell Hound. ■

Michael Lewicki (age 18) and James Karls (age 17) are seniors at Gillett (Wisconsin) High School. They taught themselves programming on a home computer and spent two years completing Fantastic Realms. Michael plans to study physics in college; James will be majoring in architecture.

What the heck?!?



MOD4 by Jack

This handy, 6x9 inch book has 218 pages packed with all the Model 4 DOS & BASIC commands with full and clear explanations. The only alternative to the bulky Model 4 owner's manual with color-coded sections, 600 entry index, and second BASIC index on the back cover. Handy!

Now only \$9.95

EXPLANATIONS IN PLAIN ENGLISH!

Profile III Plus® \$16.00
108 pages inserts for Mod3 manual w/examples, 2-16"x22" flow charts.

Super SCRIPSIT® \$16.00
Insert pages for Mod3, expands training manual. Incl. command wall chart.

General Ledger \$16.00
Insert pages Mod3 disk manual. How to run it right! Includes wall chart. Shows Cycle, P&L, Bal. Sheet, terms.

INDEXES each \$5.00
Detailed indexes on heavy stock, punched 3 hole for **Profile III Plus®** Manual, **SupSCRIP®** training manual, **Model 4** owner's manual.

WALL CHARTS each \$5.00
All commands with explanations, highly visible form for: **Profile III Plus®**, **SupSCRIPSIT-3®**, **VisiCalc®**, **Gen Ledger**, **Basic-3**, **Basic-4**.

Monthly Newsletter \$24.00
Deals mainly with word processing and data base for Mod3, 4, 100. Wide range of topics — mailed 1st class.

© — Copyright of Tandy or VisiCorp
Add \$2.00 Shipping — We use UPS.
Send Cash, Check or Money Order to

CREST SOFTWARE

2132 Crestview • Durango, CO 81301
(303) 247-9518

VISA, MC accepted — include card # and exp. date

CUT RIBBON COST



E-ZEE INKER
\$39.50

INK MASTER
\$159.00

Re-ink most fabric ribbons with only one machine

- Versatile
- Simple to Use
- No Fuss No Mess
- Adjustable

Stop throwing away used fabric ribbons. Re-ink them yourself with the E-ZEE INKER or INK MASTER. Re-ink almost any cartridge type fabric ribbon in only a few minutes. And you can do most reel to reel ribbons with an optional attachment. All without fuss! Without mess!

The manual E-Zee Inker is only \$39.50. For higher ribbon volumes and more versatility, choose the electric Ink Master at \$159.00. Ink cost is only a few cents per ribbon.



BORG INDUSTRIES, LTD.
100 Main Street
Durango, CO 81301

ORDER TOLL-FREE: 800-553-2404
In Iowa: 319/987-2976
Visa/MC accepted

256

ALWAYS AT SALE PRICES

TRS-80®

ALWAYS AT SALE PRICES

OUR TRS-80s Have the Radio Shack warranty



HARD DISK DRIVES



WE SHIP FAST!

DFW COMPUTER CENTER
326 MAIN ST., GRAPEVINE
TEXAS 76051 — (817) 481-7283



MODEL 12

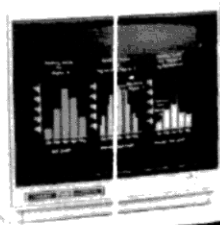


MODEL 4

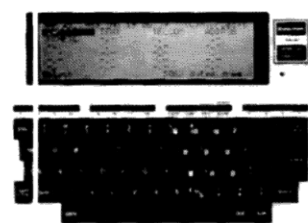
To get YOUR SALE price CALL:
1-800-433-SALE



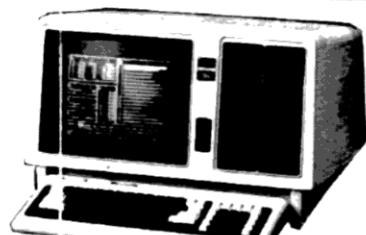
MODEL 4-P



MODEL 2000



MODEL 100



MODEL 16

The Master Handicapper™

Series by Professor Jones



EVALUATES FROM RACING FORM!

Age Gender Post (Today)
Class Jockey (Today) Post (Last)
Condition Jockey (Last) Speed
Consistency Length Trainer
Earnings Time of Year Workouts

And gives you GRAPHIC REPRESENTATION of finish

PROGRAM



GLD. Thoroughbred "Gold" Edition™

A "Full" featured thoroughbred analysis designed for the professional and 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.

PROFESSIONAL HANDICAPPING SYSTEMS

% % %
Age 5 Consistency 15 Speed 10
Class 15 Jockey 15 Workouts 0
Condition 10 Trainer 5 Time of Year 0
Earnings 5 Post 10 Consistency 5
100% Is Everything OK (Y/N)

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™



The only professional dog handicapper on the market, includes:

- 1) Speed
- 2) Post Today
- 3) Kennel
- 4) Post Last
- 5) Distance
- 6) Condition
- 7) Running Style
- 8) Weight
- 9) All new internal weighting
- 10) NEW class indicator

If you are near a greyhound track, you can't afford not to use this program. **\$149.95** complete

(with integrated Master Bettor™) **\$199.95**

Limited DOG analysis™ 299.95



MHH. Master Harness Handicapper™

Professional software designed to provide a thorough analysis of all trotter and pacer races in North America and Canada. Features:

- | | | |
|-----------------|------------------|-------------------|
| Class | Post Positions | Time Finish |
| Driver | Track Conditions | Time Last Quarter |
| Days Since Last | Trainer | Track Rating |
| Gender | Time 1/4 | Temp Allowance |

\$159.95 complete w/integrated Master Bettor™ **\$199.95**

PPX. Professor Jones' Football Predictor, Prof. Pix™

Complete Football Analysis with Data-Base.

- 1) Overlays
- 2) Point Spreads
- 3) "Super Plays"
- 4) "Over/Under" bets
- 5) Data Base Stats
- 6) Holds "100" teams

Highest percentage of winners 1983 **\$39.95** complete

\$99.95 with Data Base Management

\$\$\$ MB. Master Bettor™

A compliment to ALL Master Handicapper programs, includes:

- 1) Win/Place/Show
- 2) Quinella
- 3) Exacta
- 4) Trifecta
- 5) Pick Six
- 6) Daily Double
- 7) Money Management
- 8) Odds Analysis
- 9) and Much More

A perfect program designed to use results from all Master Programs to generate "best bet". **\$59.95** complete

Model 100 Portable Systems

TP1-Thoroughbred/Pace™ (24K) **\$99.95** complete

DG1-Master Dog Analysis™ (24K) **\$99.95** complete

Professor Jones' Basketball Analyzer Complete Program \$79.95

Send check / money order / VISA / MasterCard
(Include expiration date) to:



TELEPHONE
(208) 342-6939

Prof. Jones
1114 N. 24th St.
Boise, ID 83702



TERMS: FREE SHIPPING ALL SOFTWARE.
Add \$6.00 hardware / C.O.D. Add \$6.00 / Add 3
weeks personal checks / Add 4.5% ID residents /
Add \$6.00 outside U.S.A. / Prices subject to change.

BROCHURE AVAILABLE

Name	Hit Points	Max. Damage	Armor Class	Move-ment	Attack Distance	Un-dead	Exp.
Bombardier							
Beetle	18	12	4	2	3	No	460
Boring							
Beetle	40	20	3	1	2	No	1,275
Brownie	4	3	3	2	1	No	85
Bugbear	25	8	5	2	2	No	325
Dryad	16	4	9	2	1	No	95
Dwarf	8	4	8	1	2	No	80
Elf	9	10	5	2	1	No	230
Fire Beetle	10	8	4	2	1	No	195
Fire Giant	93	30	3	2	4	No	3,850
Frost Giant	84	24	4	2	4	No	2,740
Gargoyle	36	16	5	3	3	No	930
Ghast	32	16	4	3	3	Yes	880
Ghost	80	40	0	2	4	Yes	5,000
Ghoul	16	12	6	2	2	Yes	385
Gnoll	16	8	5	2	1	No	230
Gnome	8	6	5	1	1	No	120
Goblin	7	6	6	1	1	No	100
Groaning							
Spirit	56	14	0	3	3	Yes	1,150
Halfling	6	6	7	2	1	No	95
Hill Giant	66	16	4	2	4	No	1,450
Hobgoblin	9	8	5	2	1	No	175
Kobold	4	4	7	1	1	No	50
Lich	88	40	0	3	5	Yes	5,400
Lizard Man	17	12	4	2	2	No	420
Medusa	48	16	5	2	3	No	1,115
Mummy	51	12	3	3	3	Yes	880
Ogre	33	10	5	2	2	No	490
Ogre Mage	64	18	2	2	3	No	1,600
Orc	8	8	6	2	1	No	160
Pixie	4	4	5	2	1	No	70
Rhinoceros							
Beetle	96	34	2	3	3	No	4,560
Satyr	40	8	5	3	1	No	435
Shadow	25	12	7	3	2	Yes	500
Skeleton	8	6	7	2	2	Yes	125
Slyph	24	10	9	6	1	No	430
Spectre	59	16	2	5	3	Yes	1,375
Sprite	8	4	6	3	1	No	90
Stag Beetle	72	36	3	3	2	No	3,980
Stone Giant	75	18	0	2	4	No	1,880
Vampire	67	10	1	2	4	Yes	960
Water Beetle	32	18	3	2	2	No	980
Wight	35	12	5	3	3	Yes	660
Wraith	43	16	4	3	3	Yes	1,050
Zombie	16	8	8	2	2	Yes	230

Table 10. Monsters of the Subterranean Empire.

Table 11. Monsters of the Hallway of Death.

Name	Hit Points	Max. Damage	Armor Class	Move-ment	Attack Distance	Un-dead	Exp.
Basilisk	49	12	4	3	3	No	845
Blue Dragon	80	80	2	4	10	No	13,525
Bulette	72	84	-2	5	6	No	13,530
Chimera	72	34	2	3	4	No	3,790
Clay Golem	50	30	7	3	3	No	2,485
Displacer							
Beast	48	16	2	3	3	No	1,160
Djinni	59	16	4	4	3	No	1,330

Table 11 continued

Table 11 continued

Earth							
Elemental	96	32	2	3	3	No	4,230
Ettin	80	34	3	3	3	No	4,000
Fire Giant	93	30	3	3	4	No	3,860
Gelatinous							
Cube	32	8	8	2	2	No	360
Ghoul	16	12	6	2	2	Yes	385
Goblin	7	6	6	2	1	No	100
Gray Ooze	27	16	8	2	1	No	700
Griffon	56	24	3	5	3	No	2,080
Harpy	24	12	7	3	2	No	480
Hippogriff	27	22	5	6	3	No	1,240
Hobgoblin	9	8	5	2	2	No	195
Homunculous	16	3	6	3	1	No	100
Horned Devil	45	21	-5	3	3	Yes	1,680
9-Headed							
Hydra	72	72	5	3	3	No	10,470
Intellect							
Devourer	54	16	4	4	3	No	1,250
Kobold	4	4	7	2	1	No	50
Lamia	72	4	3	4	3	No	445
Lurker							
Above	80	6	6	3	5	No	700
Manticore	51	6	4	3	10	No	2,680
Marilith	63	18	-5	3	4	Yes	1,800
NeoOtyugh	96	27	0	3	5	No	3,600
Ogre	33	10	5	2	2	No	490
Roc	144	60	4	5	7	No	11,600
Umber Hulk	72	34	2	3	4	No	3,790
Werebear	59	30	2	3	3	No	2,800

Call ELEK-TEK for

UNBELIEVABLE PRICES!!

star PRINTERS

80 COLUMN

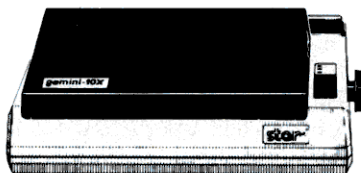
GEMINI 10X 120 CPS 250.00
 DELTA 10 160 CPS 360.00
 RADIX 10 200 CPS 530.00

132 COLUMN

GEMINI 15X 120 CPS 365.00
 DELTA 15 160 CPS 490.00
 RADIX 15 200 CPS 630.00

NEW Letter Quality PRINTER

POWERTYPE Better Quality 18 c.p.s. **325.00**



Cables for Epson	
CB5622 10 ft. 36/36 pin standard parallel	32.00
CB5609 8 ft. 36/25 pin parallel for IBM	25.00
CB5618 6 ft. 36/16 pin parallel for TI-99/4A	25.00
CB5629 10 ft. 25 pin standard RS-232 (fully loaded)	25.00
CB5620 6 ft. parallel for TRS 80 Model I-III-IV	22.00
RS1Y RS-232 Y cable for TI-99/4A	25.00

Interfaces	
CARDCO G	65.00
APPLE DUMPLING GX	65.00
GRAPPLER PLUS	105.00
Buffered (16K) GRAPPLER PLUS	165.00
Elek-Tek Dust Covers available for Gemini models	5.00

CALL TOLL FREE 800-621-1269 EXCEPT Illinois, Alaska, Hawaii

CORP. ACCTS. INVITED. MIN. ORD. \$15.00 Mastercard or Visa by mail or phone. Mail Cashier's Check, Money Ord., Pers. Check (2 wks. to cir.) Add \$4 1st item. (AK, HI, P.R., CANADA ADD \$10.00 FIRST ITEM) \$1.00 ea. add'l shipg. & handl. Shipments to IL addreses add 7% tax. Price sub. to change WRITE FOR FREE CATALOG. RETURN POLICY: Replacement only for defective on arrival. Thereafter, MFR. Warranty applies. All ELEK-TEK MERCHANDISE IS BRAND NEW, FIRST QUALITY AND COMPLETE.

ELEK-TEK, inc.

6557 N. Lincoln Ave. Chicago IL 60645
 (800) 621-1269 (312) 677-7660

134

WHEN YOU TYPE "TALLY"

you get what you
thought those
"CALC" programs
would give you:

- easy to use
- simple and logical
- totals by item and category
- every category named
- built-in sorts
- clear documentation



Whether you're managing
a home budget or business
expenses, TALLYMASTER
gives you better
understanding and control.

Customers told us:

"Looks like just what I need to
keep track of Income & Expenses
in my Real Estate appraisal
business." (L. E.)

"Well-packaged, clear
instructions, easy to
use." (G. L. G.)

"Just what we need for In-
house Budgets." (N. Ariz. Univ.)

And, '80 MICRO gave it a Five
Star review: "I recommend Tally-
master to every user who wants a
good, easy, accurate bookkeep-
ing system, and to anyone inter-
ested in home or small business
budgeting and bookkeeping."
(July, 1983)



All this for only **\$79.95**
 (TRS-80 Models I, III, 48K, disk)

Also available for MS DOS
128K, disk. Has Function Key support and
an even faster sort.
Special price: \$99.95

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

PROSOFT®

Dept. G, Box 560, No. Hollywood, CA 91603
 (818) 764-3131 Information and same-day processing
 TERMS VISA, MC, checks, COD. Please add \$2.00
 shipping in U.S. or Canada, sales tax in CA.
 Most orders filled within one day.



DIXON TICONDEROGA 1388-2 SOFT

Picture This

by Jeff Reifman
12-14-Year-Old Category

I decided to soup up what would otherwise be a standard graphics program with some unique features. Graphix offers a number of ways to create designs. You can use graphics blocks (where you turn on and off individual graphics blocks), string blocks together to form a straight line, or draw diagonal lines using either the arrow keys or the Autoline function (described below).

In addition, Graphix provides routines to fill in a shape with a single key-stroke, create large-size letters, draw a border around your design, and produce inverse video characters and shapes. Graphix also offers a help screen.

Graphix provides a total of nine buffers so you can save one design while you work on another, or combine screens from different buffers to get a composite printout (see the Figure).

Starting Off

To begin using Graphix, assemble the source code in the Program Listing, turn on your printer, and type in PROG.

Graphix then asks from which of the program's nine buffers you want to load a design. Since you haven't saved any screen to a buffer, type in any number from 1-9 and you're ready to draw.

Graphix Modes

Graphix operates in three modes: Print, Clear, and Neutral. When you boot up Graphix, it's automatically in the neutral mode. You change modes by hitting the key corresponding to the mode you want to invoke (P, C, or N). Once you're in that mode, use the command keys as listed in the Table and described below.

The Print Commands

To create a design, you need to get into the Print mode (I use "print" here to mean print on the screen.) Position the cursor using the arrow keys, then hit the P key. In the Print mode, you draw free-form with the cursor; that is, the cursor leaves a trailing line wherever you move it. Pressing the horizontal and vertical arrow keys simultaneously moves the cursor diagonally. Pressing the left-shift key speeds up cursor movement.

To make drawing lines easier, Graphix's Autoline routine draws a line between any two points you select. This routine adds flexibility to the angle of the lines you can create because diagonal lines you draw with the arrow keys draw at one angle only.

To use Autoline, move the cursor to the line's starting point and hit the A key. Then move the cursor to the destination of the line and press the Z key. Graphix then draws a line between those two points.

To draw more lines from point A, move the cursor to new points and hit the Z key each time.

Special Graphics Commands

Graphix also has commands for special graphics features. Inverse video (I) turns the screen from black-on-white to white-on-black, and vice versa. Press the space bar as you invoke reverse video to inverse a portion of the screen.

Type in M to display large letter forms on screen. Position the cursor where you want the left side of the letter to appear and press the M key. Then type in the letter you want to appear, and Graphix displays it. You must

repeat this process for every letter you want to display.

The T command overlays screens from two or more buffers. To make an overlay, load a screen from the buffer, press the T key, and type in the number of another screen buffer. You can combine as many screens as you wish by pressing the T key and a screen buffer number.

The Fill command (F) fills in a figure. Position the cursor inside a figure you've drawn and press the F key. Graphix only fills in enclosed figures. Using Fill with open figures will crash the program.

The Border command (B) draws a border around the screen.

The Clear Mode

You use the Clear mode (C) to erase lines. In the Clear mode, you remove any lines the cursor moves over. You can erase diagonal lines by hitting the horizontal and vertical arrow keys at the same time, and Autoline erases lines between two points. The Border command erases a border in the Clear mode.

The Neutral Mode

The Neutral mode (N) lets you move

The Key Box



Model III
48K RAM
TRSDOS 1.3
Radio Shack Editor/Assembler
Radio Shack printer with bit
graphics required

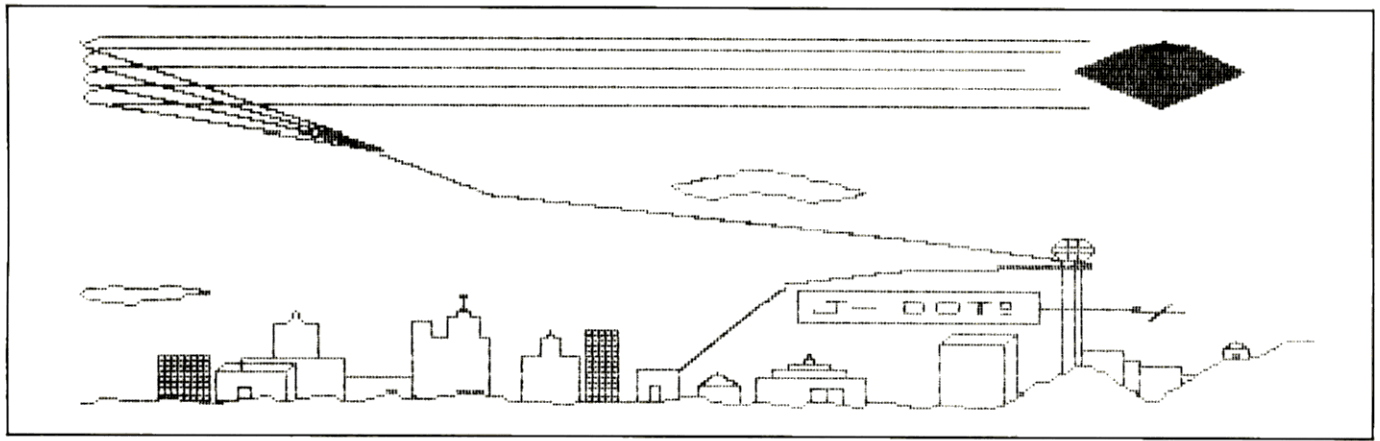


Figure. This small-print picture combines nine of Graphix's screens.

the cursor around the screen without drawing or erasing lines. You can, however, set and reset individual graphics blocks in the Neutral mode by positioning the cursor and hitting the spacebar (to set a graphics block) or the asterisk key (to reset a block) as desired.

Saving and Loading Designs

Graphix does all its work through the buffer. When you first boot up the program, you're asked to select a buffer number; you create a screen in that buffer. But be sure you save the screen back to the buffer or you'll lose it when you invoke one of the ancillary program commands, like printing the screen or overlaying it with another screen. Similarly, when you load a file in from disk, you have to save that file to a buffer to do any further work.

To save a screen to a buffer, hit the S key and type in a buffer number from 1-9 at the prompt. If you want to save that screen to disk, press the O key, then the S key, and Graphix will prompt you for a file name.

To load a screen from a buffer, hit the L key and enter the appropriate buffer number. To load a screen from disk, hit the O key, then the L key, then the file name at the prompt. To keep that screen, save it to a buffer before loading another screen.

You can quit and return to TRSDOS Ready at any time by pressing the Q key; pressing the H key displays a table of program commands and definitions.

Screen Printing

The D command sends screens to the printer. After pressing the D key, select the small- (1) or large- (2) print option. Then you have to specify which buffer you want printed out.

The small-print option prints three screens side by side in compressed for-

mat, producing a high-resolution drawing. You have to identify the three screens you want printed in the order you want them to appear at the appropriate prompt.

You can connect sets of three screens in layers to create a picture. For instance, the Figure comprises a total of nine screens in three layers. If you want to print more than three layers, save the additional screens to disk and load them to buffer as needed.

The large-print option sends one screen to the printer at actual size. Enter

the screen number you want to print at the prompt. ■

Jeff Reifman is 14 years old. His idea for the graphics representation of letters in the Letters Form routine comes from More TRS-80 Assembly Language Programming, by Bill Barden Jr. (available at Radio Shack stores). The Fill routine is from "Fill-Ins," by David Lewis (80 Micro, October 1984, p. 126).

Contact Jeff at 2316 Banyon Drive, Los Angeles, CA 90049.

Command	Definition	Command	Definition
A	Autoline start point for line	M	Display letter forms
B	Draw screen border	N	Invoke Neutral mode
C	Invoke Clear mode	O	Load or save file to disk
D	Send screen to printer	P	Invoke Print mode
F	Fill enclosed figure	Q	Exit program
H	Display help menu	T	Overlay Screens
I	Inverse video	Z	Autoline line end point
L	Load screen buffer		

Table. Graphix's commands.

Program Listing. Graphix source code.

```

00100      ORG      7000H
00110 SR2    DEFB   0
00120 SR3    DEFB   0
00130 PRDAT  DEFS   150
00140 DX      DEFB   0
00150 DY      DEFB   0
00160 XS1    DEFB   0
00170 XS2    DEFB   0
00180 YS1    DEFB   0
00190 YS2    DEFB   0
00200 CRDX   DEFB   0
00210 XPLUS  DEFB   0
00220 YPLUS  DEFB   0
00230 BUF2   DEFW   0
00240 DD      DEFB   1
00250        DEFB   2
00260        DEFB   4
00270        DEFB   8
00280        DEFB  16
00290        DEFB  32
00300        DEFB  64
00310 CURR   DEFS   1024

00320 L1     DEFS   300
00330 SCREEN DEFS   10240
00340 N      DEFB   0
00350 Y      DEFB   0
00360 MD     DEFB   0
00370 A1     DEFB   0
00380 B1     DEFB   0
00390 C1     DEFB   0
00400 PP     DEFB   0
00410 F1     DEFB   0
00420 F2     DEFB   0
00430 START  CALL   FIRSCR
00440        CALL   STATUS
00450        CALL   01C9H
00460        LD     A,18
00470        CALL   3BH
00480        LD     SP,0FFFEH
00490        LD     HL,SCREEN
00500        LD     BC,10240
00510 ST1    LD     A,128
00520        LD     (HL),A
00530        DEC    BC

```

Listing continued on p. 76

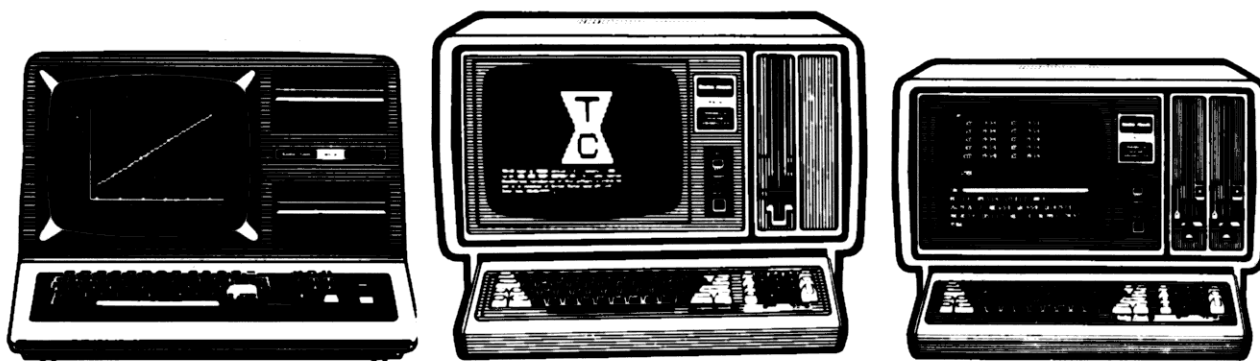
NOCONA

ELECTRONICS

MODEL 4

MODEL 16

MODEL 12



MOD2000 W/MONO MONITOR	2299.00
MOD2000 W/COLOR MONITOR	2669.00
256K MOD 1200 HD 1 DR.	2349.00
128K MOD 1000 1 DR. W/MONO ...	1065.00
128K MOD 1000 2 DR. W/COLOR ..	1519.00
16K MOD 4 CASSETTE VERSION ...	579.00
64K MOD 4 2 DR. RS232	935.00
64K MODEL 4 PORTABLE	935.00
80K MOD 12 W/2 DR.	2719.00
15 MEG HD AND KIT II/12/16	2318.00
15 MEG HD AND KIT III/4	1999.00
30 MEG HD (PRIMARY)	2609.00
35 MEG HD (PRIMARY)	2759.00

DMP 105 PRINTER	145.00
DMP 110 PRINTER	269.00
DMP 120 PRINTER	359.00
DMP 430 PRINTER	585.00
DMP 2100P PRINTER	1499.00
DWP 210 PRINTER	429.00
DWP 510 PRINTER	1139.00
DWP 210 TRACTOR FEED	99.00
DWP II/510 TRACTOR FEED	159.00
DMP 2100/2100P TRACTOR FEED ...	115.00
PARALLEL PRINTER SWITCH	96.00
64K PRINTER CONTROLLER	199.00
6'PRINTER CABLE 4/4P/2000/12/16....	29.00

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

DIXON TICONDEROGA 1388 - 2 SOFT

The Pecking Order

by Jeffrey D. Zare
11-Year-Old and Under Category

Number Eaters uses true number-crunching in a Model I/III game; you scurry around the screen in the guise of a number, gobbling up any numbers lower than yourself while avoiding higher numbers that appear randomly.

You start out as the number 3 and use the arrow keys to move around the screen. You score 10 points for each number you eat that's lower than you, but watch out for higher numbers and other symbols—you lose one life if you touch them.

You also have to beware of asterisks that move constantly from the bottom to the top of the screen. If an asterisk hits any number (including you), that number is immediately surrounded with Z's. If you get trapped by the Z's, you must wait until a number your size or smaller replaces one of the Z's so you can eat your way out of the trap.

For each game, you get three lives, or three chances to reach a score of 200. If you do score 200, you're promoted to the next-highest digit. Each time you increase to a higher number, the screen clears and you start eating a fresh bunch of numbers.

The highest number you can become is a 7. When you reach 200 points after becoming a 7, you get an extra life instead of increasing to the number 8.

If you lose track of where you are during the game, press the clear key and look for the blinking number—that's you.

Game Play

Before you play Number Eaters, get into Basic and type in the Program List-

ing. Save the game under the file name NOEATERS. To play the game, type in BASIC "NOEATERS" at the TRSDOS Ready prompt. Good luck! ■

Jeffrey D. Zare, age 9, lives at 220 Barlow Ave., Sarasota, FL 33582.

The Key Box



Models I and III
16K RAM Cassette Basic
32K RAM Disk Basic

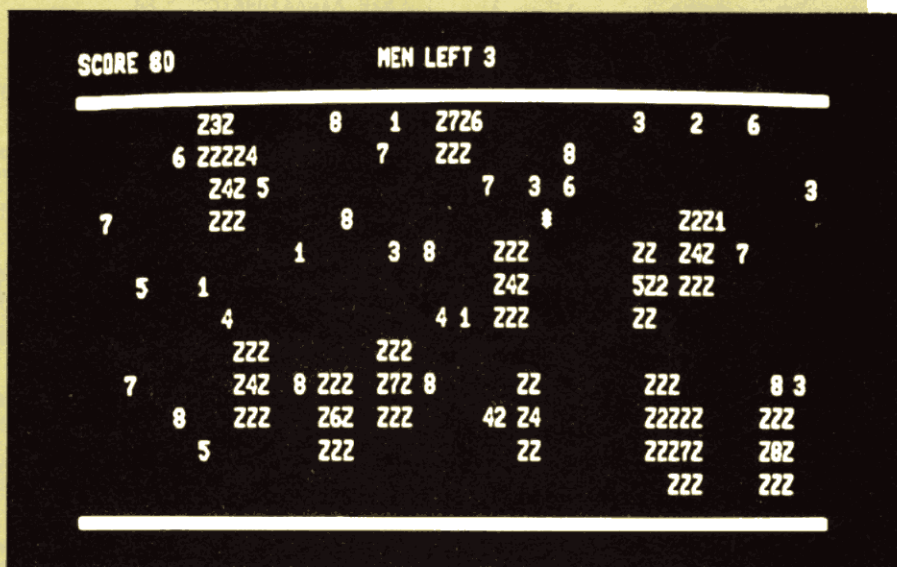


Photo. Playing Number Eaters on the Model III.

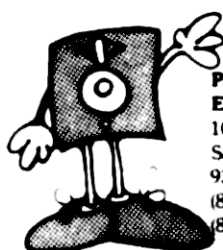
Program Listing. Number Eaters.

```
10 ' NOEATERS by Jeffrey D. Zare
20 CLS
30 CLEAR 6000
40 INPUT "DO YOU WANT INSTRUCTIONS ? (Y/N)";RS
50 IF LEFT$(RS,1)="Y" THEN GOSUB 530
60 CLS
70 YS=3:SC=0:ME=3:YP=542:NC=48:PM=15360:NH=8:A4=RND(64):A4=A4+896
80 A=PEEK(14400)
```

Listing continued

MEMOREX FLEXIBLE DISCS

**WE WILL NOT BE UNDER-
SOLD!** Call Free (800)235-4137
for prices and information. Dealer
inquiries invited and C.O.D.'s
accepted.



**PACIFIC
EXCHANGES**

100 Foothill Blvd
San Luis Obispo, CA
93401 In Cal call
(800)592-5935 or
(805)543-1037

✓207

NEW! Lower Prices!!

wabash

six-year warranted

DISKETTES!

\$11.90/box (10)

5 1/4" single-side, single-density; double-density
add \$2/box. Add \$3 per order shipping. In Illinois
add 7% sales tax.

Library Case-\$1.50 (with disk purchase)

Immediate shipment on VISA, MasterCard or
Money order; add 14 days for personal checks

CALL TOLL FREE

(800) 222-1248

In Illinois Call (312) 882-8315

DEALERS! SCHOOLS! USER GROUPS!

Call for our volume discount prices! ✓367

DIGITAL IMAGES

1185 Tower, Schaumburg IL 60195

PRINTER OWNERS

Letters are received here on a regular basis
from customers saying how much they really
enjoy receiving our lists.

It's probably safe to say that the price lists
issued here are different from most of the
others. Maybe it's the chatty folksy style of
writing? Perhaps it's the low, almost unbe-
lievable, prices on printer cartridges? Again,
it could be dealing with a dealer that under-
stands the hobby Computer user and really
cares about what you think?

Send your name and address today for a
rather fat envelope of printer and computer
related offers.

ZYGOTRON

P.O. Box 27
Fremont, Michigan 49412

✓279

Listing continued

```

90 IF A<>0 THEN PRINT@YP," ";
100 IF A=8 THEN YP=YP-64
110 IF A=16 THEN YP=YP+64
120 IF A=32 THEN YP=YP-1
130 IF A=64 THEN YP=YP+1
140 PRINT@A4," ";A4=A4-64:IF A4<129 THEN 510
150 IF YP>896 THEN 410
160 IF NH>143 THEN NH=143
170 B=B+1
180 IF B=5 THEN B=0:PP=RND(704):PRINT@PP+128,CHR$(NC+RND(NH));PP=
0
190 P4=PEEK(15360+A4-64)
200 IF P4<>32 AND P4<>0 AND P4<>98 AND P4<>140 THEN GOTO 490
210 PRINT@A4,"*";
220 PK=PEEK(15360+YP)
230 PN=PK-48
240 IF PK=32 THEN NN=YS
250 IF PK=0 THEN NN=YS
260 NN=PK-NC
270 IF PK=32 THEN NN=YS
280 IF PK=0 THEN NN=YS
290 IF NN>YS THEN 410
300 IF NN<YS THEN :GOSUB 470
310 IF YS=8 THEN ME=ME+1:YS=7
320 IF NN<0 THEN NN=YS
330 IF A1>190 THEN YS=YS+1:A1=A1-200:CLS:NH=NH+1
340 IF PEEK(14400)=130 THEN NH=NH+1
350 PRINT@YP,CHR$(NC+YS);
360 PRINT@64,STRING$(64,CHR$(140));
370 PRINT@896,STRING$(64,CHR$(140));
380 PRINT@0,"SCORE"SC;
390 PRINT@25,"MEN LEFT"ME;
400 GOTO 80
410 TE=3:YS=3:CLS:ME=ME-1:YP=542:IF ME=0 THEN 420 ELSE 80
420 PRINT@960,"YOUR SCORE WAS"SC;
430 FOR X=1 TO 3000:NEXT
440 CLS:INPUT"DO YOU WANT TO PLAY AGAIN ? (Y/N)";RS
450 IF LEFT$(RS,1)="Y" THEN RUN
460 IF LEFT$(RS,1)="N" THEN END ELSE GOTO 440
470 SC=SC+10
480 A1=A1+10:RETURN
490 PRINT@A4-129,"ZZZ";PRINT@A4-65,"Z";PRINT@A4-63,"Z";
500 PRINT@A4-1,"ZZZ";GOTO 510
510 A4=RND(64)
520 A4=A4+896:GOTO 80
530 CLS
540 PRINT" In Number Eaters you start out as the Number 3. Ot
her
numbers ranging from 1 to 9 appear randomly on the screen
. You get 10 points each time you eat a number smaller than yours
elf. ";
550 PRINT"Each time you get 200 points you increase in value, the
screen clears and you start again. However, your largest size is
7. Instead of increasing when you're a 7, you get an extra life
";
560 PRINT" You start out with three lives at the beginning of the
game."
570 PRINT
580 PRINT" Letters and symbols also appear on the screen. Wat
ch out for these and any number higher than you - you will lose a
life if they touch you."
590 PRINT:PRINT:INPUT "PRESS ENTER TO CONTINUE ";RS
600 CLS
610 PRINT
620 PRINT" All through the game there are *s moving from bottom
to top. If the * gets under anything, that thing will be immediat
ely surrounded by Zs. ";
630 PRINT" If you get trapped by the Zs you must wait until a nu
mber smaller than you replaces a Z. Then you can eat the number a
nd get out of the trap."
640 PRINT
650 PRINT" If you want to see where you are at any time, press
the CLEAR key and look for the flashing number - that's you."
660 PRINT
670 PRINT" Use the arrow keys to move around the screen."
680 PRINT
690 PRINT
700 INPUT"PRESS ENTER WHEN YOU ARE READY TO PLAY ";RS
710 RETURN

```



End

PRINTER DRIVERS FOR SUPERSCRIPST

Easily and automatically attach your printer to SuperSCRIPST with an ALPS software driver program. No need to learn any special codes. Call or write for latest Product Review Sheet describing features supported on each printer (underline, bold, Proportional, etc.).

Over 120 different printers supported.
2-1/2 years experience. Customer support.
\$49 or \$99 each, depending on which printer

Use Memory as Disk* Mod 4(III) \$39

Speed up programs by using your extra memory as a drive. Use MEMDISK as your System Drive, or load files into memory for instant access. Easy to use with 1 simple command. No program changes required to access MEMDISK as if it were a disk drive. An entire MEMDISK can quickly and easily be saved to (or loaded from) floppy disk.
(Uses 80K of 128K memory (64K on 4P). (DOS only).)

TIME-SAVERS TANDY 2000 & 1200 IMPROVE PERFORMANCE & FLEXIBILITY OF YOUR PC APPLICATIONS

Use Memory as Superfast Disk \$49

RAMDISK - Use spare memory as a disk to speed up applications. (You specify RAMDISK size.) Appears to programs as a disk, but gives instant access. Easy to install and use. Superfast!

Directory / File / Backup Tools \$59

1. Display alphabetized 5-column directory listings. View entire directory at a glance on 1 screen.
2. Find a file - search thru all directories for a file name and display all occurrences.
3. Directory Tree - display directory tree structure below any name in easily readable form.
4. Backup only modified files - speed up and automate backup operation. Stores in same format as original for direct access. Great for hard disk!

User Tool Assortment \$59

1. Define a command as one key. Keyboard aid - less typing and faster data entry by defining any command string as 1 key, then press key to perform.
2. Count lines on files. Displays count.
3. Dump files in Hex and character (with scrolling).
4. Change ownership & attributes of files. You can make files hidden, read-only, or read to original.

Attach a Serial Printer \$49

With 2 easy commands, you can attach a serial printer to the RS232 port. Complete instructions.

More ALPS tools are available. Call or write for catalog. All products are guaranteed to perform as advertised. We provide full customer support.

ALPS

23 Angus Road
Warren, New Jersey 07060
201-647-7230

✓374

Put an Amber CRT in Your Computer

Now you can eliminate the strobe, flicker and fatigue from your computer terminal with a new amber Soft-View™ replacement CRT from Langley-St. Clair.

Available for the TRS-80, TeleVideo, Kaypro, Heath, DEC, Zenith, IBM PC, Apple III and a wide variety of other monitors. These new replacement display tubes use amber phosphors which exceed the European standards for persistence and color. And the "decay" or fade-out rate of the phosphor is the same as the "refresh" or scanning rate of the computer screen, so the display glows gently, rather than flickering like a strobe light - an annoying problem with inexpensive green phosphor tubes.

- Available in medium decay "European Phosphor" (the standard in Europe).
- Made with Lead/Strontium impregnated glass that stops X-ray emission.
- High-contrast double dark face glass that also cuts U.V. radiation.
- Face of tube is etched to stop glare.
- Easily installed...comes with pre-mounted hardware.
- Ideal for word processing and programming, yet fast enough for games and graphics.
- Warranted for one full year against manufacturing defects or tube failure.
- Comes with a 30 day money back guarantee.



Also in green



Call now to order your "Soft-View™" CRT from Langley-St. Clair - \$99.95*

800 221-7070

In New York call 212 989-6876

✓462

Please specify computer and model number when ordering. Dealer inquiries invited.

TRS-80, TeleVideo, Kaypro, Heath, DEC, Zenith, IBM PC and Apple III are registered trademarks of Tandy Corp., TeleVideo Corp., NonLinear Systems, Inc., Heath Co., Digital Equipment Corp., IBM, and Apple Computer, Inc. Soft-View is a trademark of Langley-St. Clair Instrumentation Systems, Inc.

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

TRS-80™ "CAN YOU BUY DIRECT?"

WILL YOU PAY TOO MUCH?

Ask About Our
"30 DAYS
Buy-Back-Policy"

MODEL 16B 768K 1 DRIVE
PLUS 15 MEG HARDDRIVE
(BUILT-IN)

MODEL 12 768K 2 DRIVES

MODEL 4 128K 2 DRIVES

MODEL 4-P 128K 2 DRIVES

SAVE SALES TAX*
PLUS DISCOUNT

*TEXAS RESIDENTS ADD ONLY 4%

FORT WORTH COMPUTERS

WE ARE SERIOUS ABOUT SAVING YOU MONEY

(Located 30 miles from Fort Worth)

377 Plaza • GRANBURY • NR FORT WORTH, TEXAS 76048

TOLL FREE NUMBER: 1-800-433-S-A-V-E

Monday thru Friday - 9:00 a.m. to 5:00 p.m. Texas Time
(Order Inquiries/Customer Service &) IN TEXAS: 817-573-4111

✓214

TM: TRADE MARK
OF RADIO SHACK





Hardin Brothers' guide to commercial tools
for the serious Assembly-language programmer.

Labor Saver

To be a proficient Assembly-language programmer, you need to start with a good editor/assembler. But don't stop there—you should also consider a variety of other tools to increase your productivity and help reduce the frustrations inherent in programming in a low-level language.

The first two tools seem obvious: a disk system and a printer. It's possible to do without them, but it's also possible to take a mountain hike without shoes. Debugging, the most difficult and time-consuming part of Assembly-language programming, is a constant process of loading an assembler, loading source code, assembling a program, testing it, loading a monitor program, fixing a bug, and then starting all over. Without a disk system to speed up the process of loading programs and codes, you'll spend most of your time waiting impatiently. And without a printout of each major revision of

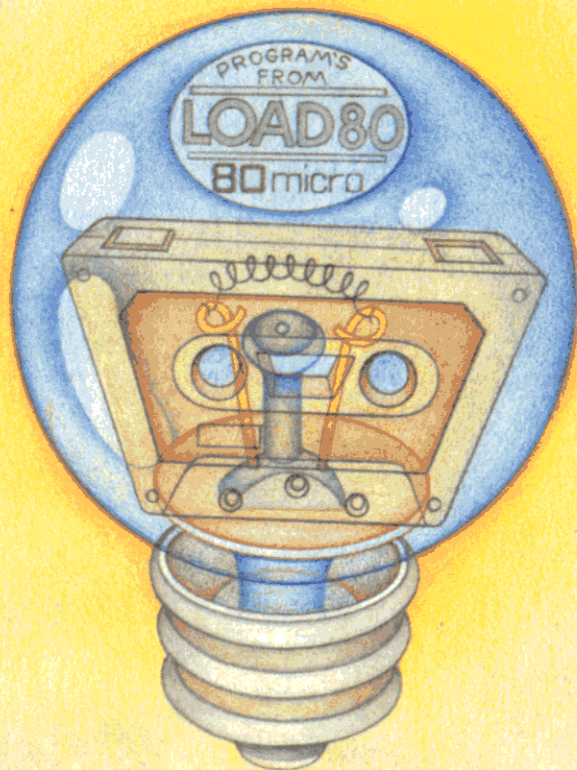
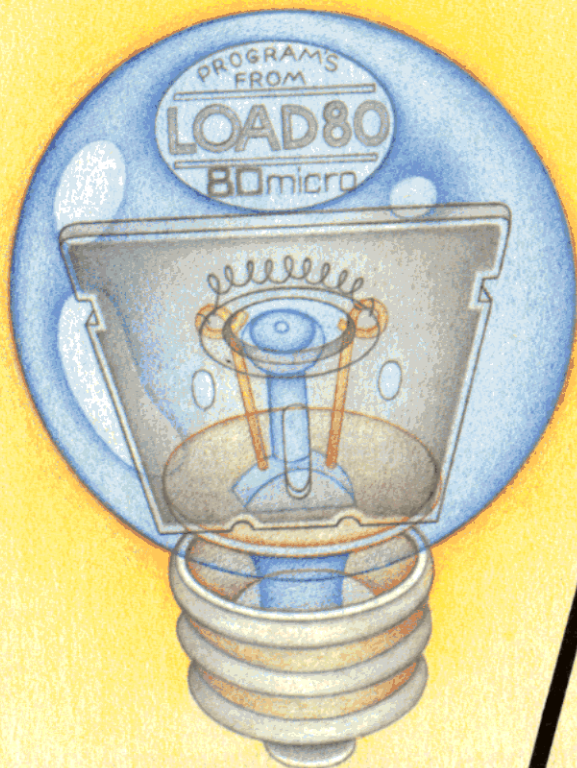
your program, you'll never know where you are in the program or what's supposed to be happening.

Monitor Programs

Having a good monitor program is almost as important as having a disk system and a printer. In Basic, it's a simple matter to scatter Stop commands throughout your program so you can test the values of various variables each time the program stops. A monitor program lets you do the same sort of checking in Assembly language.

At the very least, a monitor should let you step through a program one instruction at a time, execute subroutines in full, examine both the hexadecimal (hex) and ASCII representations of any block of memory, modify any part of memory, and display and change the values held in the Z80's registers.

GREAT IDEAS IN A DISK



GREAT IDEAS IN A CASSETTE

NOW, you can load the major programs from 80 MICRO—automatically.

LOAD 80 is a collection of the major programs from each issue of 80 MICRO including: tutorials...utilities...games...home-hobby applications...word processing programs...and more. Each program is on a formatted disk or cassette and ready to run...saving you hours of key-in time. And Model III users can now run **LOAD 80** automatically—our new disk transfer system eliminates conversions.

For less than \$2.00 per program **LOAD 80** gives you a library of over 100 quality programs in just 12 months—delivered to your home each month.

Plus, a year's subscription to **LOAD 80** saves you nearly 30% off the single disk or cassette price—that's enough for a year's subscription to 80 MICRO.

Your **LOAD 80** comes complete with user support. Just call 1-603-924-9471 any business day and you'll receive prompt assistance from our **LOAD 80** staff and the 80 MICRO Technical Editors.

To get your time-saving subscription or monthly issue of **LOAD 80** call toll free 1-800-258-5473 (in New Hampshire dial 1-924-9471). Or fill out this coupon and send it in today.

YES! Save me time. Save me money with **LOAD 80**.

- ☐ Send me a year of **LOAD 80** on disk for \$199.97
- ☐ Send me a year of **LOAD 80** on cassette for \$99.97.
- ☐ Send me this month's **LOAD 80** disk for \$21.47
- ☐ Send me this month's **LOAD 80** on cassette for only \$11.47.

Prices include postage and handling.
Foreign airmail please add 45 cents per item
or \$25.00 per subscription. U.S. funds drawn
on U.S. bank only.

☐ Check/MO ☐ MC ☐ Visa ☐ AE

Card# _____ Exp. Date _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____



LOAD 80



L8502

80 Pine Street • Peterborough, NH 03458

You can choose from three types of monitors. The most prevalent, and usually the weakest, are the Debug programs included with every DOS. These are often adequate for debugging a small or moderate-size program. They perform the functions mentioned above; some also search through memory for a specified set of bytes, move a block of memory from one location to another, and set a block of memory to a specified value.

The DOS monitors have one great advantage over all the others. They almost invariably load in the DOS overlay area so they don't interfere with your program, wherever it loads in memory. However, that feature can quickly turn to a disadvantage if your program makes calls to DOS routines that load in the same area—the address and programming conflicts will often cause both Debug and the DOS to crash.

In-memory monitors necessarily occupy part of the RAM program area, but by doing so they never conflict with DOS.

The second type of monitor programs are those supplied with some editor/assembler packages. These are generally similar to Debug in their capabilities and commands, though a few can also display parts of your program in symbolic, disassembled form.

The third kind of monitors are sold as separate utilities, and they're generally the most powerful monitors available. I've tried several, though by no means all, of these stand-alone monitor programs, and my favorite for the Model I/III/4 is Tasmon from The Alternate Source (see the Table for manufacturers' addresses).

Tasmon has four features that I find particularly useful. First, it allows up to nine breakpoints. You can set each to stop the program after anywhere from 1–256 loops; for example, you can set breakpoint 5 to stop after 78 executions and breakpoint 2 to stop after 25. Such counted breakpoints are extremely useful for testing program loops. Also, you can set the breakpoints anywhere in

RAM or ROM. Most monitors allow breakpoints only in RAM.

Second, besides the regular single-step modes that all monitors have, Tasmon can run a program at several slow speeds, so you can watch the registers or video display change.

Third, it has a complete disassembler built-in. With it, you can display a disassembled listing of any block of memory and scroll forward or backward a page at a time, as well as scroll forward a single instruction at a time. I know of no other monitor that can scroll its disassembler in reverse through memory, and I've found this feature extremely helpful.

Fourth, Tasmon lets you dedicate a 1K block of memory as a shadow video display. Tasmon saves whatever your program would normally display on the screen in that shadow display, so you can examine both the normal monitor display on the screen and, by pressing a single key, the screen display that your program will create. This unique feature makes Tasmon the most useful monitor I've seen for debugging complex display-oriented programs.

I've had only one problem using Tasmon on a Model 4 in Model III mode. It has its own keyboard driver with a debounce routine set for the clock speeds of the Models I and III. If you use the program with the Model 4's faster clock speed, it suffers from terrible keybounce. Be sure to turn off any fast clock modification you have (including the one built into LDOS 5.1.4) before invoking Tasmon.

Books and References

A well-stocked reference library is another necessity for the serious Assembly-language programmer. You need at least one book explaining the Z80 instruction set so you can understand the effects and timing of each instruction. Of the dozens of books available, I've found none better than the documentation included with each of the Radio Shack assemblers. If you own one of them, look no further.

I also like to have a reference card beside me when I work, to check the available commands and their relative speeds. My favorite is the Z80 Reference Card published by Nanos Systems Corp.; it's available in most B. Dalton bookstores.

But having the Z80 instruction set at your fingertips isn't enough. Almost all my programs use ROM and DOS routines. The DOS routines are, of course, documented in the DOS manual (alternative DOSes invariably have better technical documentation than Model I/III TRSDOS). Finding the correct ROM routines can be a problem, however.

The Alternate Source
704 N. Pennsylvania Ave.
Lansing, MI 48906

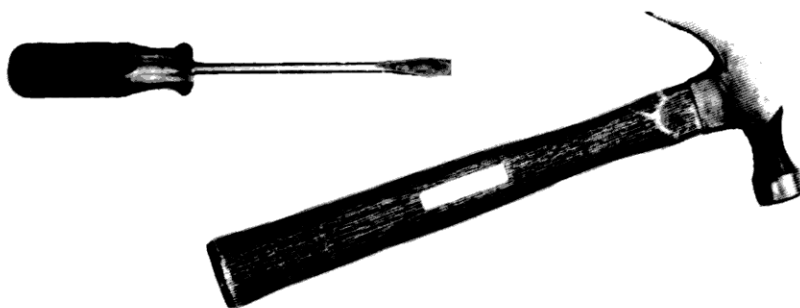
Tandy/Radio Shack
One Tandy Center
Fort Worth, TX 76102

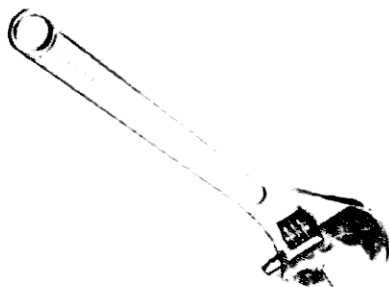
Nanos Systems Corp.
P.O. Box 24344
Speedway, IN 46224

IJG
1953 W. 11th St.
Upland, CA 91786

Misosys
P.O. Box 4848
Alexandria, VA 22303

Table. Manufacturers of recommended products.





I draw heavily on two books for Model I/III ROM routines. The first is James Farvour's *Microsoft Basic Decoded*, published by IJG. Though this book is a commented disassembly of the Model I's ROM, the Model III's ROM is so similar that most information applies to both machines.

Even more useful is Jack Decker's *TRS-80 ROM Routines Documented* (published by The Alternate Source). This isn't a disassembly at all, but a commentary on several hundred routines in the Model I and Model III ROMs, and it tells you how to use each routine. For many projects, this is the most useful book in my reference library.

Though each applies to a specific topic of Model I/III programming, I find almost all IJG TRS-80 books useful from time to time. I strongly recommend that you buy any of these books that applies to your programming projects, if only for their prewritten routines.

Disassemblers

A disassembler is a software tool that converts a CMD file or section of memory to source code, which you can load back into an editor/assembler, display on screen, or print out. Strictly speaking, you don't need a disassembler to write Assembly-language programs, but most programmers use one.

I have two equally valid reasons for disassembling a program that someone else has written. The first is to learn how professional programmers achieve specific results. Though it's illegal to copy the code from a program you've purchased, it's perfectly legal to learn a technique from the program.

One of the joys of Assembly-language programming is being able to tailor programs to fit your exact needs. Though I have many useful commercial programs, I always find a way to improve each to meet my particular work habits. With a disassembler, you can study a program to find out how it

works, and then find patch points to add your own modifications. It's not easy to do, but with a good disassembler and monitor and a lot of patience, you can generally decipher any piece of code.

The best-known Model I/III disassembler is the one that comes with NEWDOS80. It's been included with every version of NEWDOS80 since Apparat released version 2.1 in 1979. This early TRS-80 disassembler is useful, but suffers from one major flaw: It can't distinguish between program instructions and program data. For example, if the original program contained the code:

```
DEFM '(Y/N)?'
```

the Apparat disassembler might very well disassemble it as:

```
JR Z,2F59H (Y/  
LD C,(HL) N  
ADD HL,HL )  
CCF ?
```

You can easily tell by looking at the right-hand column that this is a section of program data, but its form is confusing. Even more frustrating is the disassembler's insistence on regarding a 256-byte data area, initialized to all zeros, as four and a half pages of NOP instructions.

Some disassemblers are advertised as being able to recognize program data automatically and disassemble it as such. Some types of program data (such as ASCII messages) are easy to recog-

nize. Others, such as tables or graphics values, aren't. Often, only the context of the program can help you decide which is which.

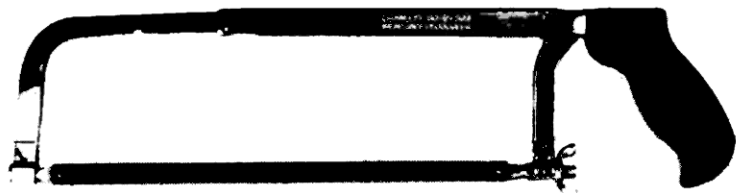
Because of those considerations, I use DSMBLR III from Misosys. DSMBLR doesn't attempt to separate instructions from data; it lets you do so. When you use DSMBLR, you start with disassemblies to the screen, watching for sections of data in the program code. The more you use a disassembler, the easier it is to spot those sections. After the first disassembly, you create a text file of sections that you want to mark as data. You can mark the data sections as ASCII messages, 1-byte hex values, or 2-byte hex words.

After two or three passes with DSMBLR, you should have a fairly accurate set of screening data in the text file, and a final disassembly to either disk or printer will be as close to the original Assembly-language program (without the comments, of course) as any disassembler can take you. Though DSMBLR III is made for use with Misosys's EDAS assembler, it can also create disk source files that are EDTASM-compatible. The program's data sections are marked with DB, DM, and DW pseudo-ops instead of DEFB, DEFM, and DEFW, but you can easily substitute any format you want using your editor/assembler's search and replace facility.

Putting It All Together

With a quality editor/assembler, disk system, printer, monitor program, disassembler, and a library of reference works—and a lot of practice—you'll be able to take direct control of your computer and make it do whatever you want as quickly and efficiently as possible. ■

Hardin Brothers is an associate editor for 80 Micro. He also writes The Next Step, a monthly column on Assembly language appearing in this magazine. You can write to him at 280 N. Campus Ave., Upland, CA 91786.



DiskCount Data

WHERE
QUALITY PROGRAMS
MEET COMPETITIVE PRICES

2701-C W 15th • SUITE 324 • PLANO, TX 75075 • (214) 680-8268

All MOD III programs specified in this ad will run on the Model 4 (in the MOD III mode).

FREE SPECIALS

Order over \$100 or more and select one of the following • MELTDOWN • VOYAGE OF THE VALKYRIE • MASTER DIRECTORY • THE GREEN WINDOW.

Order over \$200 and select one of the following
CLEAN SLATE • PROPIX • GAME PAK 3 • AOS UTILITIES • SUPERKEYS

ELECTRIC WEBSTER
by Cornucopia Software

ONLY 119.95

149.95 SAVE 20%
WITH CORRECTING FEATURE

Reviewed as the best proofreader and spelling checker on the market. Works with SCRIPSIIT LAZY WRITER, ELECTRIC PENCIL, ZORLOF, NEWSRIPIT, COPYART and ACD'S SUPERSCRIPIT. Separate version available for R/S SUPERSCRIPIT. Sold with correcting feature for 149.95.

OUR PRICE: 119.95
HYPHENATION OPTION*: 39.95
GRAMMAR & STYLE CHECKER*: 39.95
MOD I/III

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

APPLICATIONS

Survey Analyst	195.00
Superlog I/III/4	114.95
Masterdirectory Mod III	29.95
Superdirectory Mod I/III	44.95
Datagraph I/III/4/Max	69.99
Datagraph Pie Chart Option	29.95
EE Ladder Network I/III	39.95
EE Ladder Network Tape	29.95
The Basic Checkbook I/III	64.95
Mterm I/III/4	64.99
Loan Amortization III	29.95
PowerMail Plus I/III/4	124.95
Text-Merge for Powermail	49.95
Descriptive Statistics Cass	20.99
The Home Accountant III	62.50
Electronics I I/III Cass	20.99
Electronics II I/III Cass	20.99
Electronics III I/III Cass	20.99
Active Filter Design I/III Cass	20.99
Mostly Basic Scientific Cass	14.99
Mostly Basic Educational Cass	14.99
Mostly Basic Household Cass	14.99
ICS Professional I/III	148.00
BBS-80 Bulletin Board I/III	74.99
Infocan I/III (Keyword D-Base)	44.95
Ultraterm I/III	39.95
Ultraterm 2.0 w/auto-logon	49.95
TallyMaster	69.95
The Test Generator Mod III	34.95
SPS Statistical Analysis Mod I	150.00

THE HOME ACCOUNTANT
By Continental Software

ONLY 62.50

An Outstanding Financial Planner

- Maintains up to 100 budget categories
- Keeps track of up to five 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 assets
- One program handles cash, checkbooks, credit cards and other liabilities and expenses
- Unlimited annual transactions, fiscal or calendar year
- Transactions may be "split" among different budget categories
- Flags transactions for tax purposes
- Maintains transaction history
- Provides Hi-Res graphics for any category by bar graph

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

MOD III

GRAPHICS

Powerdraw I/III	34.95
Dotwriter 4.0 I/III/w LDS	84.95
Dotwriter 4.0 4/4p/w LDS	99.95
Graphit	34.95
Plotting Graphs Printer Cass	20.99
Plotting Graphs Video Cass	20.99
AOS Utils. Screenpacker Plus	49.95
PowerDot II I/III Spec. Printer	54.95

OPERATING SYSTEMS

CP/M 2.2 Montezuma Mod 4	169.95
R-Shack HD Driver for CP/M 2.2	39.95
Dosplus II II/12/16 (Z-80)	194.95
Dosplus 4A With M-ZAL	129.95
Dosplus 3.5 I/III	69.95
Dosplus 3.3 Mod I S or DD	39.95
Multidos 1.6 I/III	59.95

HYPERCROSS/XT
By Hypersoft

79.95

COPY YOUR FILES TO/FROM
TRSDOS MSDOS CP/M
SPECIFY MOD I DD III or 4

A NEW AND OUTSTANDING TRSDOS/MSDOS/CP/M conversion utility. Hypercross will work with ANY TRS-80 DOS to allow you to format and copy files back and forth on your TRS-80. The following commands are supported: FORMAT, DIR, COPY, USE, RCP, M, SELECT, HELP and FAST-HELP. Dosplus, a summary list of commands. Easy menu driven. HYPERCROSS XT is the finest program we've used. It will support the following ALLEN systems:

IBM PC/MSDOS 1.1, 2.0 and compatibles; TANDY 2000 and these CP/Ms: ARDUAN, ACCESS, MATH, ACCESS, ALTOS, ATR, BORG, CCS, FORMING, DEC, STEAR, RUBIN, DEL, RAINBOW, EAGLE, EPSON, FLORIDA, GRAPHICS, BEACON, HP125, IBM CP/M, KAYPRO II 4.8, 10, 12, 16, 20, CP/M, LOGI, MAX, 80, MORROW, NEC, PC, 8080, OSBORNE, TIRONA, SANYO, 386, COMPUTERS, SUPERBRAIN, TELETEN, SYSTEM MASTER, TELEVIDEO, TRS-80, LIFEBRAT, OMICRON, HOLMES, HURRICANE and SHUFFLEBOARD; MONTZUMA 7.0, RS CP/M, XEROX ZENITH 40 and ZORBA And 8 CP/M Standard on 8 drives.

BOOKS, WALL CHARTS & MISC

Inside Super Utility 3.0/3.2	17.95
Super Utility Tech Manual 3.x	13.95
TRS-80 Encyclopedia I/III/4	19.95
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
BFB Library Disk I/III	16.95
BFB Demo Disk I/III	16.95
TRSDOS 6/LDOS Programmers Guide	18.95
Green Screens I/II/III/4/4P	16.95
Diskettes SSDD 10 in Plastic Bx	19.95
Profile 3 - Commands Wall Chart*	4.00
Visical Commands Wall Chart*	4.00
Superscript Wall Chart*	4.00
Model III Basic Wall Chart*	4.00
Model 4 Basic Wall Chart*	4.00

* Charts not shipped as separate order

SUPER UTILITY PLUS
VERSION 3.2
By Powersoft

SAVE

SALE: 69.95
MOD 4 Version Now Available

NEW SUPER UTILITY+
VERSION 3.2
Includes Operators Manual and 2nd Backup Disk

The Book Inside SU+ 3.2
NOW ONLY 17.95

Experience a legend with the program voted as the outstanding utility of 1982 and 1983.

MOD I or MOD III Protected Media

GRAPHIC GAMES AND SIMULATIONS

Voyage of the Valkyrie I/III	29.95
Voyage of the Valkyrie Tape	19.95
Meltdown (Nuclear Powerplant)	19.95
Gamepak-3 (Funface, Match, etc.)	29.95
Pro-Pix USFL or NFL Version	29.95

WORD PROCESSORS & PRINTER DRIVERS

Electric Pencil 2.0z I/III	79.95
M-Script I/III/4	65.95
LeScript I/III/4/Max	109.95
Clean Slate I/III	49.95
Electric Webster (specify)	119.95
Grammar & Style (specify)	39.95
Hyphenation Opt. (specify)	39.95
PowerDriver-E Epson I/III/4	29.95
PowerDriver-P Prowriter I/III/4	29.95
PowerDriver-S Starwriter I/III	29.95
PowerDriver-O Okidata 92 I/III	29.95
PowerDriver-FX (FX/RX) I/III/4	29.95
Epson Driver Compiler	29.95
PowerScript for Scripsit I/III	34.95

GENERAL LEDGER By FBN Systems

SAVE 50%

If you're tired of your present ledger, tired of lost data, tired of having to refer to instructions and tired of its non-professionalism, you need the FBN General Ledger.

Multiple Cash Accounts. Departmentalize any account. You select which accounts print on income statement & balance sheet. Real-time transaction posting. No more bad-in-processing, initial audit trail. We have what we believe to be the finest general ledger for the Model III on the market. Call for more details or order now. A most pleasant surprise.

REDUCED TO 149.95

INSTRUCTIONAL VIDEO

TAPES VHS/BETA

Profile III Plus	36.99
SuperScript	36.99
Lazy Writer	36.99
Newdos-80	36.99
Scripsit	36.99
TRSDOS 1.3 (Mod III)	36.99
TRSDOS 6 (Mod 4)	36.99
TRSDOS 6 Disk I/O (Mod 4)	36.99
TRSDOS 1.3 Disk I/O (Mod III)	36.99
Multidos	36.99
Dosplus	36.99
LDOS 5.x	36.99
Visicalc	36.99
CP/M 2.2 Montezuma (Mod 4)	36.99
Multipan (Mod 4)	36.99
PFS File (Mod 4)	36.99
Mod I Level II Basic	46.99
Model III Basic	46.99

UTILITIES

SuperUtility Plus 3.2 I/III/4	69.95
SuperUtility Plus 4/4P	79.95
TextPress I/III (ASCII Comp.)	49.95
Ale Editor/Assembler I/III	38.95
The Toolbox for LDOS	44.95
LC Compiler/EDAS I/III/4	139.99
ALCOR C Language Compiler	139.00
ALCOR Editor I/III	49.00
ALCOR Advanced Development Pkg	69.00
ALCOR C Complete System	250.00
ALCOR Pascal Cross Reference	29.00
ALCOR Multi-Processor Assemblr	69.00
AOS Superkeys	35.00
6.X Plus. (Enhance TRSDOS 6.X)	39.95
The Toolbelt Mod 4	44.95
AOS Utils 1 Varkeep/Scrnprk	49.95
Impakt for Basic I/III	34.95
Pro-Cess Mod 4	37.95
Pro-Create Mod 4	94.95
Pro-Cure Mod 4	46.95
Pro-Duce Mod 4	37.95
Pro-Pads Mod 4	37.95
Enigma Encryption Utility	34.95
Basic-S Compiler System	34.95
M-ZAL Release 3 Mod I/III	74.95
Zues Editor/Assembler I/III/4	74.95
Master Mechanics Set for LDOS	24.99
E-Basic (specify DOS)	49.95
System Diagnostic I/III/4	89.99
Base34 (Mod III to 4 Convert)	44.95
Hypercross/XT TRSDOS/CP-M/MSDOS	79.95
Trashman	34.50
Fast	24.95
RPM	21.50
DSMBLR III I/III	34.95
Accel 4 Basic Compiler I/III	94.95
Monitor 5 I/III/4	22.95

BBS-80
by MicroSystems Software

ONLY 74.95

RUN YOUR OWN BULLETIN BOARD

Your computer becomes a mini communications network. BBS-80 allows a person to exchange messages or information via the telephone. Access can be completely public, private to authorized users or limited to certain individuals. BBS-80 can leave messages on another terminal acting as a rapid electronic mailman. BBS-80 provides some of the most advanced and most convenient features ever incorporated in a microcomputer bulletin board system including: users may send private messages that may be ready only by the addressee. Multi-level system security allows up to 15 levels of security in both the message base and the user's downloaded database. BBS-80 remembers each regular user and stores terminal information, access levels, last message retrieved during last call, etc. Individual user passwords (users may upload or download data and programs) files to BBS-80. These programs may then be downloaded to other BBS-80 users. BBS-80 is self-maintaining. Message space is automatically reclaimed when messages are deleted.

DiskCount Data

214-680-8268

Send Cash, Check or Money Order
Please add \$3.00 for postage and handling, additional \$2.00 for C.O.D.s
Foreign orders welcome, please specify air or surface
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 W 15th St, Suite 324, Plano, TX 75075
Office Hours Mon-Fri 10AM to 9PM C.S.T.



Cheerfully Accepted

204

By the Numbers

by Arnold E. van Beverhoudt, Jr.

Plot numerical data on either line or bar charts, then display the graphs sequentially with Graph Master's slide show option.

options to create a graph, edit the current graph, print a graph, load a graph from disk, present a slide show (to display a series of graphs sequentially), or end the program.

If you opt to create a new graph (menu option 1), a submenu gives you the choice of developing either a bar or line graph. Once you've made this decision,

Graph Master takes you to the input routine for the appropriate type of graph (see Table 1 for a list of program subroutines).

Graph Master's Input routine prompts you for information needed to produce each graph. You're asked to supply headings for the graph, the maximum value of the Y-axis (vertical), and the number of points you want plotted along the X-axis (horizontal). I've set the number of points at 12, which lets you plot a graph for a 12-month period. You can remove this limit simply by changing the value of the variable MB in line 30 (see Table 2 for a list of program variables).

Finally, you're prompted for both the X-axis label and the Y-axis values for each point you want plotted. Graph master automatically scales the X- and Y-axis options for bar and line graphs based on the values you enter. When you're finished inputting, press the enter key and the graph is constructed.

Saving, Editing, And Printing Graphs

When Graph Master finishes drawing a graph,

I recently used a CP/M business graphics package that produced high-quality charts and graphs and wished I could get the same kinds of graphs on my Model I as easily as I did with that package. But then I thought, "Why not?" Thus began Graph Master, an easy-to-use, menu-driven Basic program (see the Program Listing) that creates crisp bar and line graphs with a Model I or III (see Figs. 1 and 2).

Mastering Graph Master

It's easy to develop your own graphs with Graph Master: You choose from six straightforward menu

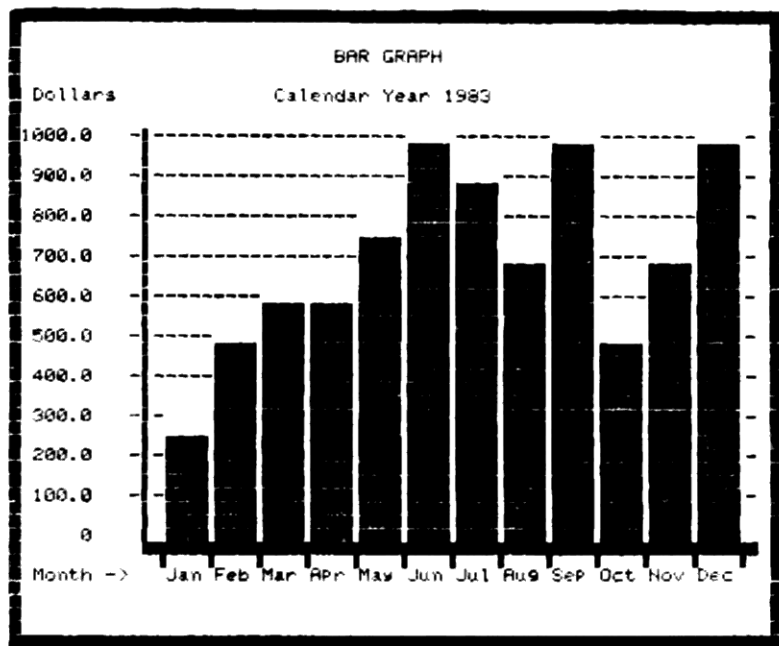


Figure 1. Sample bar graph.

you can save, edit, or print it. Graph Master's Save routine prompts you for a file name, then saves the raw data you input. The program then redraws the graph on-screen and saves the screen image as part of the same file.

After you create a graph, Graph Master sets the variable G\$, in line 1140, to either B or L, depending on the type of graph you make. The Edit option (choice 2 on the menu) looks at the value in G\$ and branches to the edit section appropriate for either a bar or line graph. You're shown the current value of each variable and given the chance to change any of them. If you want to maintain the current values, simply press the enter key.

When you've finished making changes, Graph Master displays the updated graph. If you want to make further changes, the program calls the edit routine. Once again, you're given the chance to save this revised graph before returning to the main menu.

Selecting the third menu choice, the print option, gives you a printout of the graph currently in memory. This routine first draws the graph to the screen, then invokes a standard screen dump to the printer. The screen dump routine in lines 870-1070 is for the Radio Shack Line Printer VII (DMP-100). If you have another type of printer, replace these lines with a screen dump routine appropriate for your printer.

The fourth option on the main menu lets you load a saved graph from disk. After you input a file name, the routine inputs the raw data for the graph and retrieves the screen image,

displaying it on the screen. If you choose not to save the graph to disk, it remains in memory until you either create a new graph, load a graph from disk, or present a slide show.

Slide Shows

Graph Master's slide show option (option 5) presents a unique alternative to traditional graph displays. This interesting feature is simply a loop that loads a series of up to 10 graphs and lets you look at each one before loading the next graph in the sequence. With this program option, you can present a series of

graphs without having to enter a file name before displaying each graph. If you want more than ten graphs in a presentation, change the value of the variable MG in line 30.

The last item on the main menu lets you end the program and gives you the chance to save the current graph if you haven't already done so.

Error-Handling

Graph Master is relatively bomb-proof; each time it presents an option, the program checks for valid input. The values that you input are then checked against the maximum values set to MB and MG in line 30. If you try to edit or print when there's no data in memory, Graph Master returns you to the main menu. An error trap in the Load Graph routine also returns you to the main menu if you enter a

nonexistent file name. If the printer isn't on-line when you select the print option, the program, once again, transfers you to the main menu. If the worst does happen, you can restart Graph Master without losing any data by issuing a GOTO 70 command. ■

Write to Arnold E. van Beverhoudt Jr. at P.O. Box 56, St. Thomas, Virgin Islands 00801.

The Key Box



Models I and III
32K RAM
Disk Basic
Printer optional

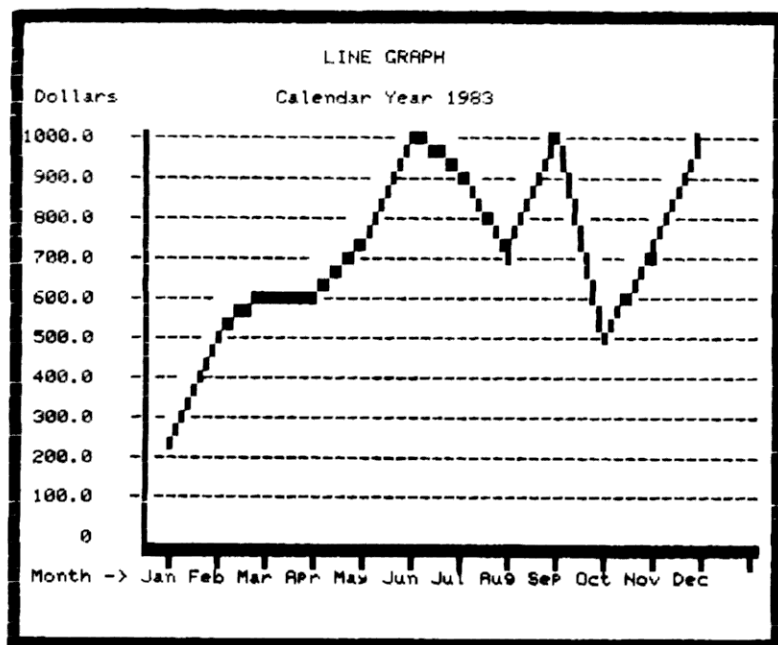


Figure 2. Sample line graph.

THINK

Original IBM Motto Plaque

THINK TWICE

Watch your TRS-80 Model I/III outperform the IBM PC, thanks to Southern Software!

Think your TRS-80's been left behind? Think twice! Fact is, the Model I/III can run Basic programs faster than IBM PC or Tandy 2000 with Southern Software's **ACCEL3/4** Basic Compiler.

Example: Benchmark in May 80-Micro

IBM-PC	177 seconds
Tandy 2000	58 seconds
ACCEL3/4 on Model I	20 seconds
ACCEL3/4 on Model III	17 seconds

Program changes are rarely (if ever) required because **ACCEL3/4** accepts the whole Basic language. Low code growth (compiles 25K+ programs), uses any DOS, no royalties on compiled code. Your Model I/III beats out the PC, with **ACCEL3/4**. \$99.95 +\$2 s/h

Writing Basic programs? Think twice! No EDIT on the PC. Southern Software's **EDIT** is on-line with 30+ full-screen commands. 1000% better Basic programming! \$40 +\$1.50 s/h

Database management? Think twice! Southern Software's relational **ENBASE** has a unique set-theoretic design that's fundamentally more advanced, yet costs hundreds less! \$140+\$3 s/h

Machine-language program development? Think twice! Southern Software's **SBE** mid-level language compiler works on IBM PC and compatibles (including Tandy 2000)! **SBE/TRS**: \$100 +\$3 s/h, **SBE/PC**: \$160+\$3 s/h

Better-than-PC performance on your Model I/III! Just think . . .

CA add 6%

☎ (415) 681-9371 ✉ 136

Allen Gelder Software

Box 11721 San Francisco, CA 94101

Lines	Function	Lines	Function
20-50	Initialize variables and arrays	1480-1540	End program
60-190	Main menu	1550-1740	Display bar graph
200-540	Create graph	1750-2070	Display line graph
550-810	Edit graph	2080-2240	Save graph
820-1110	Print graph	2250-2260	Center screen headings
1120-1300	Load graph	2270-2290	Disk input error routine
1310-1470	Present slide show		

Table 1. Independent subroutines.

Variable	Definition	Variable	Definition
B	Number of bar/line points	N	Number of bar/line points
CH	CHRS value for disk save of screen	N1	Scaling variable for bar/line
D	Loop counter	NG	Peek location for screen save
FS	File name for disk input/output		Switch to designate presentation (SS)
FS(MG)	File names for presentation	P	Number of graphs for presentation
G	Loop counter	SW\$	Loop counter
GS	Type of graph (B/L)	T	Peek location for screen print
HS	Screen headings to be centered	V	Loop counter
H1\$	Main heading for graph	W	Set X coordinate
H2\$	Subheading for graph	X	Labels for bar/line X-axis points
HXS	Title for bar/line X-axis	XS(mb)	Scaling variable for bar/line
HYS	Title for bar/line Y-axis	X1	Set Y coordinate
I	Loop counter	Y	Values of bar/line Y-axis points
L	Variable for bar line scaling routine	Y0(mb)	Scaling variable for bar/line
M1	Maximum value of bar/line Y-axis	Y1	Menu selection variable
MB	Maximum number of bar/line points	Z	INKEY\$ variable
MG	Maximum number of graphs in presentation	Z\$	

Table 2. Variables and arrays used in Graph Master.

Program Listing. Graph Master.

```

10 REM *****
***** GRAPH MASTER *****
***** (1984) BY *****
** ARNOLD E. VAN BEVERHOUDT, JR. **
*****

20 REM *** INITIALIZE VARIABLES & ARRAYS ***
30 CLEAR 1000:GS="":MB=12:MG=10
40 DIM Y0(MB),XS(MB)
50 DIM FS(MG)
60 REM *** MAIN MENU ***
70 SW$="":CLS:H$="*** GRAPH MASTER ***":GOSUB2260:PRINT:PRINT
80 HS="MAIN MENU":GOSUB2260:PRINT:PRINT
90 PRINTTAB(21);"1 - CREATE New Graph"
100 PRINTTAB(21);"2 - EDIT Current Graph"
110 PRINTTAB(21);"3 - PRINT Current Graph"
120 PRINTTAB(21);"4 - LOAD Graph from Disk"
130 PRINTTAB(21);"5 - PRESENT Slide Show"
140 PRINTTAB(21);"6 - END Program"
150 PRINT:PRINT
160 HS="Enter your choice (1 to 6)":GOSUB2260
170 Z$=INKEY$:IF Z$="" THEN GOTO 170 ELSE Z=VAL(Z$)
180 IF Z<1 OR Z>6 THEN GOTO 70
190 ON Z GOTO 210,560,830,1130,1320,1490
200 REM *** CREATE NEW GRAPH ***
210 CLS:H$="CREATE NEW GRAPH":GOSUB2260:PRINT:PRINT
220 HS="GRAPH MENU":GOSUB2260:PRINT:PRINT
230 HS="1 - BAR Graph":GOSUB2260:PRINT
240 HS="2 - LINE Graph":GOSUB2260:PRINT
250 HS="3 - MAIN MENU":GOSUB2260:PRINT
260 PRINT:PRINT
270 HS="Enter your choice (1 to 3)":GOSUB2260
280 Z$=INKEY$:IF Z$="" THEN GOTO 280 ELSE Z=VAL(Z$)
290 IF Z<1 OR Z>3 THEN GOTO 210
300 IF Z=1 THEN GS="B" ELSE IF Z=2 THEN GS="L"
310 ON Z GOTO 330,330,70
320 REM *** BAR or LINE GRAPH ***
330 CLS:IF GS="B" THEN H$="BAR GRAPH" ELSE H$="LINE GRAPH"
340 GOSUB2260:PRINT:PRINT
350 B=1
360 INPUT"Enter MAIN HEADING";H1$

```

Listing continued


```

370 INPUT"Enter SUB-HEADING";H2$
380 INPUT"Enter X-AXIS HEADING";HX$
390 INPUT"Enter Y-AXIS HEADING";HY$
400 INPUT"Enter MAXIMUM VALUE of Y-AXIS";M1
410 INPUT"Enter NUMBER of VALUES to be used";N
420 IFN>MBTHENPRINT:PRINT"Maximum number of values allowed is";MB:
GOTO410
430 PORT=1TON:CLS
440 PRINT"Enter X-AXIS TITLE for value #";T;:INPUTXS(T)
450 PRINT"Enter Y-AXIS VALUE for value #";T;:INPUTY0(T)
460 IFY0(T)>M1THENPRINT"Value is too large":GOTO450
470 PRINT:NEXTT
480 PRINT:H$="Press <ENTER> to DISPLAY the graph":GOSUB2260
490 Z$=INKEY$:IFZ$=""THEN GOTO490
500 IFG$="B"THEN GOSUB1560 ELSE GOSUB1760
510 PRINT@973,"Do you want to SAVE this graph (Y/N) ?";
520 Z$=INKEY$:IFZ$=""THEN GOTO520
530 IFZ$="Y"ORZ$="y"THEN GOSUB2090 ELSEIFZ$="N"ORZ$="n"THEN GOTO210
ELSE GOTO510
540 GOTO70
550 REM *** EDIT GRAPH ***
560 CLS:H$="EDIT GRAPH":GOSUB2260 :PRINT:PRINT
570 IFG$=""THENH$="There is no graph currently in memory":GOSUB226
0 :PORT=1TO1500:NEXTT:GOTO70
580 GOTO600
590 REM *** BAR or LINE GRAPH ***
600 CLS:H$="EDIT GRAPH":GOSUB2260 :PRINT:PRINT
610 PRINT"MAIN HEADING: ";H1$:INPUTH1$
620 PRINT"SUB-HEADING: ";H2$:INPUTH2$
630 PRINT"X-AXIS HEADING: ";HX$:INPUTHX$
640 PRINT"Y-AXIS HEADING: ";HY$:INPUTHY$
650 PRINT"MAXIMUM VALUE of Y-AXIS: ";M1:INPUTM1
660 PORT=1TON:CLS:PRINT"VALUE #";T;:PRINT
670 PRINT"X-AXIS TITLE: ";XS(T):INPUTXS(T)
680 PRINT"Y-AXIS VALUE: ";Y0(T):INPUTY0(T)
690 NEXTT
700 CLS:H$="Press <ENTER> to DISPLAY graph":GOSUB2260
710 Z$=INKEY$:IFZ$=""THEN GOTO710
720 IFG$="B"THEN GOSUB1560 ELSEIFG$="L"THEN GOSUB1760
730 PRINT@973,"Do you want to do more EDITING (Y/N) ?";
740 Z$=INKEY$:IFZ$=""THEN GOTO740
750 IFZ$="Y"ORZ$="y"THEN GOTO560
760 IFZ$="N"ORZ$="n"THEN GOTO780
770 GOTO730
780 PRINT@973,"Do you want to SAVE this graph (Y/N) ?";
790 Z$=INKEY$:IFZ$=""THEN GOTO790
800 IFZ$="Y"ORZ$="y"THEN GOSUB2090 ELSEIFZ$="N"ORZ$="n"THEN GOTO70
ELSE GOTO780
810 GOTO70
820 REM *** PRINT GRAPH ***
830 CLS:H$="PRINT GRAPH":GOSUB2260 :PRINT:PRINT
840 IFG$=""THENH$="There is no graph currently in memory":GOSUB226
0 :PORT=1TO1500:NEXTT:GOTO70
850 H$="Prepare printer then press <ENTER>":GOSUB2260
860 Z$=INKEY$:IFZ$=""THEN GOTO860
870 IFPEEK(14312)>127THENPRINT:PRINT:H$="Printer not available":GO
SUB2260 :PORT=1TO1500:NEXTT:GOTO70
880 IFG$="B"THEN GOSUB1560 ELSEIFG$="L"THEN GOSUB1760
890 FORX=0TO127:SET(X,47):NEXTX:Y=0:FORV=1536TO16383STEP64
900 P1=0:FORI=0TO63:P=PEEK(V+I):IFP<330ORP>126THENP=0
910 P1=P1+P:NEXTI:IFP1=0GOTO950
920 FORI=0TO63
930 P=PEEK(V+I):IFP<320ORP>126THENP=32
940 LPRINTCHR$(P);:NEXTI:LPRINTCHR$(26);
950 LPRINTCHR$(10);
960 FORW=1TO3
970 P1=0:FORX=0TO127
980 P=POINT(X,Y):P1=P1+P:NEXTX:IFP1=0GOTO1040
990 FORX=0TO127
1000 P=POINT(X,Y):IFP=1THENP=255:GOTO1020
1010 P=128
1020 LPRINTCHR$(P);CHR$(P);CHR$(P);
1030 NEXTX
1040 LPRINTCHR$(10);:Y=Y+1:IFY=48THEN GOTO1090
1050 NEXTW
1060 LPRINTCHR$(30);
1070 NEXTV
1080 LPRINTCHR$(30);
1090 PRINT@976,"Do you want another COPY (Y/N) ?";
1100 Z$=INKEY$:IFZ$=""THEN GOTO1100
1110 IFZ$="Y"ORZ$="y"THENFORX=0TO127:SET(X,47):NEXTX:GOTO890 ELSE
IFZ$="N"ORZ$="n"THEN GOTO70 ELSE GOTO1090
1120 REM *** LOAD GRAPH ***
1130 CLS:H$="LOAD GRAPH":GOSUB2260 :PRINT:PRINT
1140 H$="Insert DATA DISK in drive":GOSUB2260 :PRINT:PRINT:INPUT"E
nter FILENAME";F$:CLS
1150 ONERRORGOTO2280
1160 OPEN"1",1,F$
1170 INPUT#1,G$
1180 IFG$<>"P"THEN GOTO1200
1190 REM *** BAR or LINE GRAPH ***
1200 INPUT#1,N,M1,H1$,H2$,HX$,HY$
1210 PORT=1TON:INPUT#1,Y0(T),XS(T):NEXTT
1220 FORP=1536TO16383
1230 INPUT#1,CH
1240 POKEP,CH
1250 NEXTP
1260 CLOSE1
1270 IFSW$="SS"THENPRINT@979,"Press <ENTER> to continue";:GOTO1290
1280 PRINT@977,"Press <ENTER> for MAIN MENU";
1290 Z$=INKEY$:IFZ$=""THEN GOTO1290
1300 IFSW$="SS"THENRETURNELSE GOTO70
1310 REM *** SLIDE SHOW ***

```

Listing continued

PASCAL -80

The

RUSSIANS

Can't
Buy it!

If we wanted to, we could sell our other products to the communists, but the Department of Defense won't let us sell them Pascal 80! NOW you can learn the language that is too powerful for the Red Army!

Pascal 80 is the easiest version of Pascal to learn. Hundreds of schools, including top universities are now using Pascal 80 to teach Pascal.

With the editor and compiler in memory, you can compile and run a short program in under 5 seconds. But you also get extensions to Pascal that give you screen control, random access files, calls to machine language and the ability to create turn-key packages. Pascal 80 is a nearly complete subset of standard Pascal, including structured types, records, pointer variables and files.

--TRS-80 Models I, III and 4--

Pascal 80 - \$79 + \$2 shipping
Graphics Extensions for Radio Shack hi-res board - \$39
Pascal 80 Trial Version - \$15

--for CP/M 80 2.2 or 3.0--

Kaypro, LoboMax 80, Apple, Epson Osborne, and other computers.
Call or write for other formats
Pascal 80 CP/M - \$39 + \$2 shipping

Pascal 80 School Package
(TRS-80 or CP/M versions) - \$279

NEW CLASSICS

SOFTWARE

239 Fox Hill Road
Denville, NJ 07834
201-625-8838



*TRS-80 MODEL I-III-IV-HD1200-1000

(Software Discounts)

1. Disk Operating Systems
 - DosPlus 3.5 \$59.95
 - DosPlus IVA.W/Mzal \$119.95
 - DosPlus Hard Drivers \$24.95
 - MULTIDOS 1.6D \$59.95
2. Word Processing
 - MScript \$59.95
 - Lazy Writer \$115.00
 - MAXI MAIL \$39.99
3. Terminal Communication
 - Mterm \$59.95
 - LazyComm \$34.95
 - BBS-80 \$69.95
4. Accounting System
 - Maxi Manager II \$189.95
 - Maxi Cras (Checks) \$89.95
 - VersaLedger \$129.95
 - VersaReceivables \$84.95
 - VersaPayables \$84.95
 - VersaPayroll \$84.95
 - VersaInventory \$84.95
5. CONVERT Model 3 to 4 \$49.95
6. TheWORD (Complete Bible)
 - \$199.95
7. Diskette File holders 8@ ... \$10.00

DESIGN SOFTWARE

Toll Free 24 hrs. 1-800-622-4070

Illinois Only 1-800-942-7317

Technical Ser. (702) 384-9320

Box 42847

Las Vegas, Nv 89104

* trademark of the tandy corporation

✓ 27

Listing continued

```

1320 SW$="SS"
1330 CLS:H$="PRESENT SLIDE SHOW":GOSUB2260:PRINT:PRINT
1340 PRINT"How many graphs do you want to use (maximum is";MG;")";
:INPUTNG:PRINT
1350 IFNG>MGTHENGOTO1320
1360 FOR=1TONG
1370 PRINT"Enter FILENAME for graph ";T;:INPUTFS(T)
1380 NEXTT
1390 PRINT:H$="Insert DATA DISK in drive then press <ENTER>":GOSUB
2260
1400 Z$=INKEY$:IFZ$=""THENGOTO1400 ELSE1410
1410 FORG=1TONG:CLS
1420 ONERRORGOTO2280
1430 OPEN"1",1,FS(G)
1440 INPUT#1,G$
1450 GOSUB1200
1460 NEXTG
1470 SW$="":GOTO70
1480 REM *** END PROGRAM ***
1490 CLS:H$="END PROGRAM":GOSUB2260:PRINT:PRINT
1500 H$="Do you want to CANCEL this command (Y/N) ?":GOSUB2260
1510 Z$=INKEY$:IFZ$=""THENGOTO1510 ELSEGOTO1520
1520 IFZ$="Y"ORZ$="Y"THENGOTO70
1530 IFZ$="N"ORZ$="N"THENCLS:END
1540 GOTO1490
1550 REM *** BAR GRAPH ***
1560 CLS:FORX=0TOL27:SET(X,0):SET(X,47):NEXTX
1570 FORY=0TOL47:SET(0,Y):SET(1,Y):SET(126,Y):SET(127,Y):NEXTY
1580 PRINT#65,;:PRINTTAB((63-LEN(H1$))/2);H1$;
1590 PRINT#130,HY$;TAB((63-LEN(H2$))/2);H2$;
1600 PRINT#898,HX$;
1610 L=M1:N1=INT(100/N)
1620 FORI=1TOL0:PRINT#129+64*I,;
1630 PRINTUSING"###.0";M1-M1/10*(I-1);
1640 PRINT" -";CHR$(149);STRING$(50,"-");:NEXTI
1650 PRINT#837,0;TAB(11);CHR$(141);
1660 PRINT#844,STRING$(50,140);
1670 FORI=25TOL26STEPN1:SET(1,41):NEXTI
1680 FORI=0TON-1:PRINT#909+I*N1/2,X$(I+1);:NEXTI
1690 FORD=0TON-1
1700 FORY=0TOINT(Y0(D+1)/M1*30+.5)
1710 FORZ=0TON1-2:SET(N1*D+2+26.40-Y)
1720 NEXTZ:NEXTY:NEXTD
1730 PRINT#979,"Press <ENTER> to continue";
1740 Z$=INKEY$:IFZ$=""THENGOTO1740 ELSERETURN
1750 REM *** LINE GRAPH ***
1760 CLS
1770 FORX=0TOL27:SET(X,0):SET(X,47):NEXTX
1780 FORY=0TOL47:SET(0,Y):SET(1,Y):SET(126,Y):SET(127,Y):NEXTY
1790 PRINT#65,;
1800 PRINTTAB((63-LEN(H1$))/2);H1$;
1810 PRINT#130,HY$;
1820 PRINTTAB((63-LEN(H2$))/2);H2$;
1830 PRINT#898,HX$;
1840 L=M1:N1=INT(100/N+.5)
1850 FORI=1TOL0:PRINT#129+64*I,;
1860 PRINTUSING"###.0";M1-M1/10*(I-1);
1870 PRINT" -";CHR$(149);STRING$(50,"-");:NEXTI
1880 PRINT#837,0;TAB(11);CHR$(141);
1890 PRINT#844,STRING$(50,140);
1900 FORI=26TOL26STEPN1:SET(1,41):NEXTI
1910 FORI=0TON-1:PRINT#907+I*N1/2,X$(I+1);:NEXTI
1920 I=1:Y0=Y0(I)
1930 FORX2=26+N1 TOL26 STEP1
1940 IF I=NTHEGOTO1970 ELSEY0=Y0(I)
1950 I=I+1:X1=X2-N1:Y=Y0
1960 GOSUB1990:NEXTX2
1970 PRINT#979,"Press <ENTER> to continue";
1980 Z$=INKEY$:IFZ$=""THENGOTO1980 ELSERETURN
1990 Y1=39-INT(Y/M1*30):Y2=39-INT(Y0(I)/M1*30):IFX1<X2THEN2020
2000 IFY1<Y2 THEN$=1 ELSE$=-1
2010 FORY=Y1TOY2STEP$;SET(X1,Y):NEXTY:RETURN
2020 M=(Y2-Y1)/(X2-X1)
2030 IFABS(M)>1$=ABS(1/M)ELSES=1
2040 IFX1>X2 THEN$=-S
2050 FORX=X1TOX2STEP$
2060 SET(X,M*(X-X1)+Y1)
2070 NEXTX:RETURN
2080 REM *** SAVE GRAPH ***
2090 CLS:H$="SAVE GRAPH":GOSUB2260:PRINT:PRINT
2100 H$="Insert DATA DISK in drive":GOSUB2260:PRINT:PRINT:INPUT"Enter FILENAME";FS
2110 PRINT:H$="Wait a few moments please":GOSUB2260
2120 OPEN"O",1,FS
2130 PRINT#1,G$
2140 IFG$<>"P"THENGOTO2160
2150 REM *** BAR GRAPH ***
2160 PRINT#1,N;,"M1;","H1$;","H2$;","HX$;","HY$;
2170 FOR=1TONG:PRINT#1,Y0(T);","X$(T):NEXTT
2180 IFG$="B"THENGOSUB1560 ELSEIFG$="L"THENGOSUB1760
2190 FORX=0TOL27:SET(X,47):NEXTX
2200 FORP=15360TOL6383
2210 PRINT#1,PEEK(P);:POKEP,128
2220 NEXTP
2230 CLOSE1
2240 GOTO70
2250 REM *** CENTER HEADINGS ***
2260 PRINTTAB((64-LEN(H$))/2);H$;:RETURN
2270 REM *** DISK INPUT ERROR ROUTINE ***
2280 IFERR/2+1=54THENPRINT:H$="File not found":GOSUB2260:PORT=1TO
1500:NEXTT:CLOSE1:GOTO70
2290 PRINT:H$="Disk input error":GOSUB2260:PORT=1TO1500:NEXTT:CLO
SEL:GOTO70

```

End

Tax Preparers TAXSTAR★

For Model 3 or 4 with 48K and 2 disk drives

- Will do schedules 1040, A, B, C, D, E, SE, G, W, 6251
- Tax calculations - tables, rates, income averaging
- Uses IRS prescribed computer generated printouts or overlays User friendly
- Automatically calculates excess FICA earned income credit, alternate minimum tax
- Change one figure, program recalculates entire tax return in 12 seconds

\$279.95 with user manual

Professional Tax Software, Inc.
26 Lark Lane
Croton On Hudson, N.Y. 10520
(914)-271-4723

✓ 174

From Computer Plus to YOU...

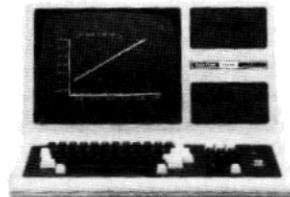
PLUS after PLUS after PLUS



Model 100 8K \$495
Model 100 24K \$625



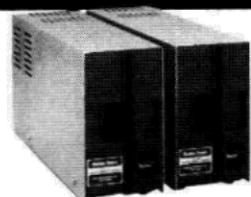
Color Computer II
w/16K Ext. Basic \$135
w/64K Ext. Basic \$195



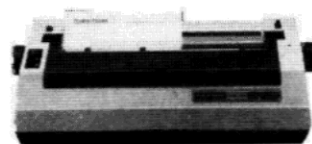
Model 4 16K \$629
Model 4 64K
2 Disk & RS232 \$1020



DMP120 \$385



Color Computer Disk Drive
Drive 0 \$289 Drive 1 \$220



DWP210 \$489
DWP510 \$1295

BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS

Model 4 Portable	
64K 2 Drives	1020
Pocket Computer 3	89
Pocket Computer 4	59
Model 2000 2 Drive	2299
Model 2000 W/Hard Disk	3599
Model 12 64K 1 Drive	2360
Model 12 64K 2 Drive	2950
Model 16B 1Dr 256K	3375
Model 16B 2Dr 256K	3965

MODEMS

Hayes Smartmodem II	215
Hayes Smartmodem 1200	505
Novation Smartcat 1200	410
Novation J-Cat	115
AC-3	125
DC Modem I	89
DC Modem II	160
DC Modem 2212	315

PRINTERS

Silver Reed EXP500 D.W.	365
Silver Reed EXP550 D.W.	430
DWP410	1159
Gemini Powertype	345
CGP115	159
CGP220 Ink Jet	545
DMP110	299
DMP420	735
Toshiba 1340 (24 wire head)	779
Gemini 10X	265
Gemini 15X	409
Panasonic P1091	315
Smith Corona Fastext	190
Prowriter 8510	345
Okidata	CALL
Epson	CALL

DISK DRIVES

Model III/4 Drive 0	465
Model III/4 Drive 1	220

Model III/4 Drive 2	259
Model III/4 Drive 3	220
Hard Disk M2000	1525

ETC.

CCR-81 Recorder	52
Cassette Tapes (10 Pk)	9.95
16K Ram Chips	25
64K Ram Chips	62.95
Model 4 64K Upgrade Kit	79.95
M100 Bar Code Reader	89
64K Printer Buffer	199
Printer Stand	25
Printer Cables	
Printer Ribbons	
Printer Paper	
Computer Books	

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

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™

\$149
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®

\$399
Delivered

RETAIL VALUE \$1354

Bundle #3

WordStar®
MailMerge®
SpellStar™
StarIndex™
DataStar™
ReportStar™
CalcStar™
Montezuma Micro CP/M®

\$499
Delivered

RETAIL VALUE \$1699

Bundle #4

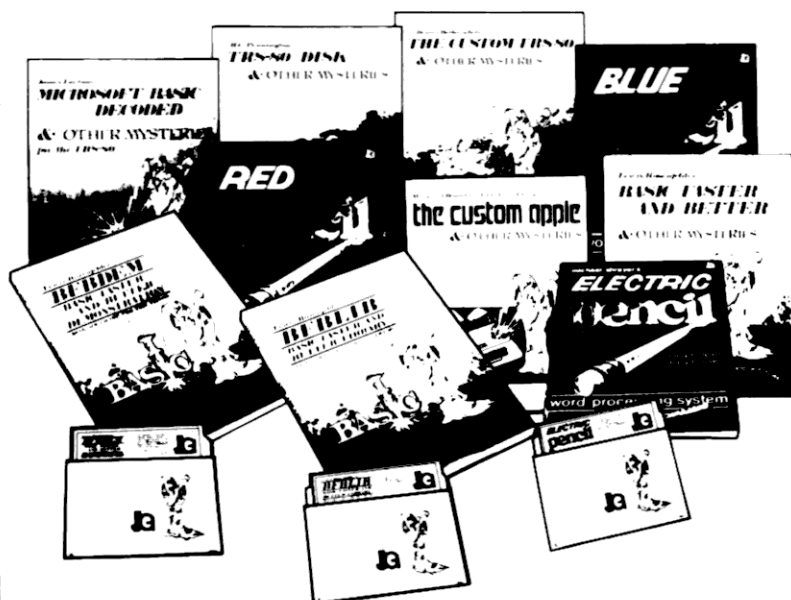
WordStar®
MailMerge™
SpellStar™
StarIndex™
dBASE II®
TurboPascal™
Montezuma Micro CP/M®

\$599
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 C.O.D. 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 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 Shrayor. 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



MONTESUMA'S REVENGE

P.O. Box 2169
Camp Verde (Lizard Flats)
Arizona 86322 416

WE KEEP YOU RUNNING

COMPUTERS

Model 4 with 2 drives & RS-232 64K Complete	\$999
26-1067 16K Model 4 Pure Radio Shack	765
26-1069 20K Model 4 64K RS232 Pure Radio Shack	1099
26-1080 64K Model 4 Portable 20K & RS232	1099
26-3026 16K Color Computer 2	144
26-3027 16K Extended BASIC Color Computer 2	179
26-3127 64K Extended BASIC Color Computer 2	179
26-3134 16K Color Computer 2	135
26-3136 16K Extended BASIC Color Computer 2	179
26-3589 Pocket Computer 3 with 4K RAM	85
26-3590 Pocket Computer 3	84
26-3601 Pocket Computer 3	89
26-3650 Pocket Computer 4	59
26-3601 Model 100 8K Portable Computer	679
26-3602 Model 100 24K Portable Computer	679
26-4004 Model 12 1 Drive	2379
26-4005 Model 12 2 Drive	2591
26-5103 Model 2000 2 Drive 128K	2333
26-5104 Model 2000 2 Hard Disk and 256K	2599
26-6004 Model 16B 1 Drive	3351
26-6005 Model 16B 2 Drive	3925
26-6006 Model 16B with 15MB Hard Disk	5352
26-6050 DT 1 Terminal	499
26-6052 NEW DT 100 Terminal	675

NEW TANDY "IBM-XT" COMPUTER. This new computer from R/S is an IBM clone and will run IBM software. Our price is complete with green monitor, color video board, 256K RAM, a 360K floppy and a 10 Mbyte internal HD. \$2695

MODEMS

26-1084 Model 4R Modem Board	\$127
26-1173 DC Model 4R Carrying Case	127
26-1174 Acoustic Coupler Modem	127
26-1175 DC Modem 1B	85
26-1176 DC-2712 High Speed Modem	339
Anchor Mark 1 Modem 300 Baud with cable	74
Anchor 300/1200 Baud Modem with cable & PS	279
Hayes Smartmodem 300 Baud	233
Hayes Smartmodem 1200 Baud	525

PERIPHERALS

LHW Expansion Interface for the Model 1 complete with 32K RAM & built-in RS-232	\$319
26-0511 Genuine RS Parityless Anti-Glare Device	14
26-1085 Model 4R Carrying Case	127
26-1131 Model 1/3 15MB Hard Disk	1399
26-1133 Model 4 15MB Hard Disk Inst Kit	85
26-1134 Model 4 15MB Hard Disk Inst Kit	85
26-1182 Model 100 Bar Code Reader	85
26-1185 NEW! Color Computer Kiosk Pad	85
26-1197 NEW! Mouse for Model 2000	51
26-1198 NEW! Serial to Parallel Converter	51
26-1208 CCR-81 Cassette Tape Recorder	51
26-1209 NEW! CCR-82 Cassette Tape Recorder	51
26-1326 Anti-Glare Panel Model 2/12/16	17
26-1342 Clear Keycover for Model 3/4	11
26-1410 Model 100 Modern Cable	17
26-1429 Automatic Power Strip/Surge Protector	42
26-1451 Non-Automatic Power Strip/Protector	42
26-1457 Anti-Glare Panel Model 1/3/4	42
26-2208 Color Computer Deluxe RS-232 Kit	69
26-3007 Color Computer Carrying Case	21
26-3026 Color Computer Joystick/Pen Pair	21
26-3032 Color Computer Joystick/Trackball	233
26-3033 Color Computer 1/2 Disk Drive 1.2 or 3	153
26-3034 Color Computer Multi-Pak Interface	153
26-3035 Color Computer Mouse	299
26-3039 Disk Drive 0 for the Color Computer	43
26-3503 PC 1 Cassette Interface	13
26-3508 PC 1 Carrying Case	13
26-3608 PC 2 Carrying Case	25
26-3612 PC 2 RS-232 Interface	25
26-3615 PC 2 8K RAM Module	118
26-3616 PC 2 8K RAM Module	118
26-3651 PC 4 Cassette Interface	3
26-3653 PC 4 1K RAM Module	16
26-3654 PC 4 Carrying Case	6
26-3804 Model 100C Adapter	34
26-3805 Model 100 Acoustic Coupler	34
26-3809 Model 100 Carrying Case	42
26-4154 Model 12/16B Internal 15MB Hard Disk Kit	2245
26-4155 Model 2/3/4/12/16 15MB Primary Hard Disk	1695
26-4156 Model 2/3/4/12/16 15MB Secondary Hard Disk	1695
26-4157 Model 2/12/16 Installation Kit for 26-4155	420
26-5113 Model 2000 511K Microphone Monitor	679
26-5112 Model 2000 CM-1 Color Monitor	679

FURNITURE

26-1305 Model 3/4 System Desk	\$152
26-1308 Universal Table	85
26-1324 Computer Table	85
26-1325 Platform for 26-1324	229
26-4303 Deluxe System Desk	229
26-4305 Deluxe System Desk	229
26-4306 Terminal Stand	76
26-4307 Printer Stand	76
26-5115 Model 2000 Pedestal	127
26-5116 Model 2000 Floor Stand	123
26-43051 Docu-Rack Stand	14

PRINTERS & ACCESSORIES

26-1190 Printer	179
26-1192 GCP-115 Color Graphics Printer	169
26-1196 GT-116 Graphics Pad	297
26-1250 DMP-410 Daisywheel Printer	799
26-1252 DMP-500 200cps Printer	1099
26-1254 DMP-200 120cps Printer	424
26-1255 DMP-120 120cps Dual Mode Printer	424
26-1256 DMP-210 Daisywheel Printer	424
26-1261 TP-10 Thermal Matrix Printer	85
26-1267 DMP-420 140cps Triple Mode Printer	849
26-1268 CUP-220 Color Inkjet Printer	849
26-1269 PTC-64 64K Printer Controller (Buffer)	212
26-1270 NEW! DMP-510 Daisywheel printer	1270
26-1271 DMP-110 50cps Triple Mode Printer	339
26-1274 DMP-2100P 160cps Triple Mode Printer	1695
26-1275 NEW! TRP-100 Printer	255
26-1276 NEW! DMP-100 New Cheesep Printer	169
26-1277 NEW! DMP-430 New Not So Cheesep Printer	769
26-1440 Single Bin Sheet Feeder for DWP-2100	849
26-1441 Bi-Directional Tractor for DWP-2100	144
26-1443 Bi-Directional Tractor for DWP-2100	144
26-1447 Bi-Directional Tractor for Daisywheel	188
26-1448 Single Bin Sheet Feeder for Daisywheel	879
26-1455 Automatic Cover	332
26-1459 Bi-Directional Tractor for DWP-410	679
26-1460 Model 1/3/4/16 Printer Cable	29
26-1468 RS-232C Cable	16
26-1469 Model 100 Printer Cable	29
26-4401 Model 2/12/16/2000 Printer Cable	29
26-1490 10 RS-232C Cable	25
26-1491 25 RS-232C Cable	25
26-1492 50 RS-232C Cable	46
26-1493 100 RS-232C Cable	46
26-1495 RS-232C Cable Extender	25
26-1496 RS-232C Null Modem Adapter	25
26-1498 SW-302 Parallel Printer Switch	102
26-1499 SW-303 RS-232C Selector Switch	102
26-3505 PC 1 Printer	89
26-3591 PC 3 Printer	128
26-3605 PC 2 Printer	89
26-3652 PC 4 Printer	89

C.I.TOH

8510BP 120cps Friction/Tractor Parallel	\$349
8510SP Hot Dot 180cps Real Fast	495
8510SCP Color High Speed printer	549
1550P Printer 2 120cps for Wide Paper Parallel	549
1550SP Hot Dot 180cps Real Fast & Wide	675
F10-40 Starwriter 40cps Daisywheel	999
F10-55 Printmaster 50cps Daisywheel FAST	1299
F10 B-Directional tractor with Plastic Cover	210
F10 Electric Single also Sheet Feeder Inst Required	775
F10 Mechanical Single Bin Sheet Feeder	499
GX-100 Gorilla Banana 50cps	175

ANAEH

DP-9725B 240cps Color Printer	1299
-------------------------------	------

We have just covers for most every printer we sell. Be sure to order one with your new printer to keep it like new.

CABLES

We manufacture a great number of different cable assemblies to connect most anything to anything else. Call us with your specific needs. We probably have it on the shelf. All at discount prices, of course.

SUPPLIES

5.25 SSDD Disquettes. Pack of 10 1 Year Guarantee	\$15
8 SSDD Disquettes. Pack of 10 1 Year Guarantee	29
8 SSDD Disquettes. Pack of 10 1 Year Guarantee	34
5.25 Floppies. Holes 75 Disks	16
8 Floppies. Holes 50 Disks	19
8.5 x 11 Tractor Paper 200 2500 Sheets	35
14 x 11 Tractor Paper 200 2500 Sheets	35
5.25 or 8 Head Cleaning Kit	9

RIBBONS

We have more than 800 different ribbons. Why too many types to list here. Add them to your order now. They're cheap too.

MONTESUMA'S REVENGE GREEN or AMBER MONITORS

Modernize your tired old Model 1 with a snappy new 12" high-resolution video monitor with your choice of a Anti-Glare slow decay green or medium decay European Amber screen. Made with Lead/Strontium impregnated frosted glass. GUESSES WHAT! The CRT from this monitor also fits the Model 2, 3, and 4 and is brighter than the more expensive Langley. SI Clear replacement CRT. Just take the tube out of the new monitor and replace your existing CRT. Then install your old B&W CRT into the new monitor and end up with a monitor you can keep or sell. Why spend all that money for just a new tube. Guaranteed for a full year. Model 1 cable available on request at no charge.

MONTESUMA'S SPECIAL PRICE \$79

SOFTWARE

Note: It is Radio Shack policy that not all multipurpose computer software packages contain disks for all models. Optional disks are available at slight extra charge. Be sure to ask for details when you order.

NEW! CP/M 2.2 by Montezuma Micro For The Model 4	\$169
Rated best by actual test. Get the good one	
NEW! Hard Disk Driver with Backup & Restore	30
26-0310 TRSDOS 2.3 For The Model 1	12
26-0312 TRSDOS 2.3 For The Model 3	12
26-0313 TRSDOS 2.3 For The Model 4	12
26-0314 TRSDOS 2.3 For The Model 4	12
26-0315 TRSDOS 2.3 Utility Disk	34
26-0316 TRSDOS 2.3 Disk Doc. Ref. Card	34
26-0413 NEW! Disk Drive Analyzer. Why pay more?	42
26-1507 Model 1/3 Stopgap	42
26-1510 Model 1/3 Trendax	51
26-1511 NEW! Model 3 Home Accountant	85
26-1512 NEW! Model 4 Target Planner/Cac	85
26-1513 NEW! Model 1/3 Cass. Spectatorator	169
26-1514 NEW! Model 3 Portfolio Manager	169
26-1515 pfs file for Model 3	85
26-1516 pfs report for Model 3	85
26-1517 pfs report for Model 4	107
26-1518 pfs file for Model 4	85
26-1520 Model 4 VisCalc Business Forecast	85
26-1521 Model 3 VisCalc Business Forecast	85
26-1522 NEW! Model 3/4 Formation	169
26-1530 Model 4 Multiplier	255
26-1538 NEW! Model 4 Apartment Management	255
26-1539 NEW! Model 3/4 W-2 Writer	42
26-1540 Model 3/4 General Ledger	169
26-1541 Model 3/4 Accounts Receivable	169
26-1542 Model 3/4 Accounts Payable	169
26-1543 Model 3/4 Payroll	169
26-1544 NEW! Model 3/4 Invoice Writer	42
26-1545 NEW! Model 3/4 Inventory Control	128
26-1546 Model 3/4 Accounts Payable	128
26-1547 Model 3/4 Business Meeting List	85
26-1548 Model 1/3 Manufacturing Inventory Control	169
26-1549 Model 1/3 Profit	68
26-1550 Model 1/3 SCRIPST	85
26-1551 Model 1/3 Mailgram	14
26-1552 Model 1/3 Mailgram	14
26-1553 Model 1/3 Medical Office Systems	254
26-1554 Model 3 VisCalc Enhanced Version	85
26-1555 Model 3 VisCalc Enhanced Version	85
26-1556 Model 3 VisCalc Enhanced Version	85
26-1557 Model 3 VisCalc Enhanced Version	85
26-1558 Model 3 VisCalc Enhanced Version	85
26-1559 Model 3 VisCalc Enhanced Version	85
26-1560 Model 3 VisCalc Enhanced Version	85
26-1561 Model 3 VisCalc Enhanced Version	85
26-1562 Model 3 VisCalc Enhanced Version	85
26-1563 Model 3 VisCalc Enhanced Version	85
26-1564 Model 3 VisCalc Enhanced Version	85
26-1565 Model 3 VisCalc Enhanced Version	85
26-1566 Model 3 VisCalc Enhanced Version	85
26-1567 Model 3 VisCalc Enhanced Version	85
26-1568 Model 3 VisCalc Enhanced Version	85
26-1569 Model 3 VisCalc Enhanced Version	85
26-1570 Model 3 VisCalc Enhanced Version	85
26-1571 Model 3 VisCalc Enhanced Version	85
26-1572 Model 3 VisCalc Enhanced Version	85
26-1573 Model 3 VisCalc Enhanced Version	85
26-1574 Model 3 VisCalc Enhanced Version	85
26-1575 Model 3 VisCalc Enhanced Version	85
26-1576 Model 3 VisCalc Enhanced Version	85
26-1577 Model 3 VisCalc Enhanced Version	85
26-1578 Model 3 VisCalc Enhanced Version	85
26-1579 Model 3 VisCalc Enhanced Version	85
26-1580 Model 3 VisCalc Enhanced Version	85
26-1581 Model 3 VisCalc Enhanced Version	85
26-1582 Model 3 VisCalc Enhanced Version	85
26-1583 Model 3 VisCalc Enhanced Version	85
26-1584 Model 3 VisCalc Enhanced Version	85
26-1585 Model 3 VisCalc Enhanced Version	85
26-1586 Model 3 VisCalc Enhanced Version	85
26-1587 Model 3 VisCalc Enhanced Version	85
26-1588 Model 3 VisCalc Enhanced Version	85
26-1589 Model 3 VisCalc Enhanced Version	85
26-1590 Model 3 VisCalc Enhanced Version	85
26-1591 Model 3 VisCalc Enhanced Version	85
26-1592 Model 3 VisCalc Enhanced Version	85
26-1593 Model 3 Profit Plus LDO/S/HO Version	254
26-1594 Model 3 VisCalc Enhanced Version	85
26-1595 Model 3 VisCalc Enhanced Version	85
26-1596 Model 3 VisCalc Enhanced Version	85
26-1597 Model 3 VisCalc Enhanced Version	85
26-1598 Model 3 VisCalc Enhanced Version	85
26-1599 Model 3 VisCalc Enhanced Version	85
26-1600 Dictionary for the Model 4	48
26-1636 NEW! TK- Solver for the Model 4	255
26-1635 NEW! TK- Solver for the Model 4	255
26-1922 Model 3/4 Orchestra 90	68
26-2011 Model 1/3 EDAS. Taps Version	29
26-2012 Model 1/3 EDAS. Taps Version	29
26-2013 EDAS. Disk Version. Model 1/3	29
26-2015 Model 3 Instruction Tapes	21
26-2016 Model 3 Assembly Language Course, Taps	54
26-2018 Model 3 Assembly Language Course, Taps	54
26-2019 NEW! TRSDOS 6 x Training Course	64
26-2022 Power Tool for the Model 1/3	43
Dot Plot for the Model 1/3	43


```

00540 INC HL
00550 LD A,B
00560 OR C
00570 JP NZ,ST1
00580 DRWP1 LD HL,L1
00590 LD BC,300
00600 ST3 LD A,128
00610 LD (HL),A
00620 INC HL
00630 DEC BC
00640 LD A,B
00650 OR C
00660 JP NZ,ST3
00670 RST1 CALL DRAW
00680 CALL 01C9H
00690 LD HL,QUMES ;WHICH SIZE?
00700 LD DE,15360
00710 CALL WRITE
00720 CALL GETCHR
00730 CP '1'
00740 JP Z,DRWPRT
00750 CP '2'
00760 JP Z,LGPRT
00770 JP RST1
00780 LGPRT LD HL,LGMES ;LARGE PRINT
00790 LD DE,15360
00800 CALL WRITE
00810 CALL GETSNM
00820 LD B,A
00830 CALL LOAD2
00840 LD A,0
00850 LD (SR2),A
00860 LPR1 LD (SR3),A
00870 LD E,A
00880 LD A,(SR2)
00890 LD D,A
00900 CALL TEST
00910 JP Z,LPR2
00920 LD A,255
00930 JP LPR3
00940 LPR2 LD A,128
00950 LPR3 CALL 3BH
00960 CALL 3BH
00970 CALL 3BH
00980 LD A,(SR3)
00990 INC A
01000 CP 128
01010 JP Z,LPR4
01020 JP LPR1
01030 LPR4 LD A,(SR2)
01040 INC A
01050 CP 48
01060 JP NZ,LPR45
01070 CALL LPRINT
01080 JP RST1
01090 LPR45 LD (SR2),A
01100 CALL LPRINT
01110 LD A,0
01120 JP LPR1
01130 DRWPRT LD IX,PRDAT ;SMALL PRINT
01140 DP4 LD HL,MES9
01150 LD DE,15360
01160 CALL WRITE
01170 CALL GETSNM
01180 ADD A,48
01190 LD (15426),A
01200 SUB 48
01210 LD (IX),A
01220 CALL GETSNM
01230 ADD A,48
01240 LD (15427),A
01250 SUB 48
01260 LD (IX+1),A
01270 CALL GETSNM
01280 ADD A,48
01290 LD (15428),A
01300 SUB 48
01310 LD (IX+2),A
01320 LD IX,PRDAT
01330 DP62 LD A,1
01340 DP7 LD (SR2),A
01350 DP8 LD A,1
01360 LD (SR3),A
01370 LD A,-5
01380 LD (F1),A
01390 LD A,0
01400 LD (F2),A
01410 DP812 CALL STSR4
01420 DP811 LD A,(IX)
01430 LD B,A
01440 CALL LOAD2
01450 LD A,0
01460 LD (A1),A
01470 LD (C1),A
01480 LD A,128
01490 LD (B1),A
01500 PUSH IX
01510 CALL SETUP
01520 POP IX
01530 CALL SENDPT
01540 CALL LISET
01550 LD A,(SR3)
01560 INC A
01570 LD (SR3),A
01580 CP 4
01590 JP Z,DP12
01600 INC IX

```

```

01610 JP DP811
01620 DP12 CALL LPRINT
01630 LD IX,PRDAT
01640 LD A,1
01650 LD (SR3),A
01660 LD A,(SR2)
01670 INC A
01680 LD (SR2),A
01690 CP 7
01700 JP Z,DP13
01710 CP -1
01720 JP Z,DP14
01730 JP DP812
01740 DP13 LD A,(F2)
01750 DEC A
01760 LD (F1),A
01770 LD A,48
01780 LD (F2),A
01790 LD A,-2
01800 LD (SR2),A
01810 JP DP811
01820 DP14 JP DRWP1
01830 SENDPT LD HL,L1 ;SEND A LINE OF DATA TO PRINTER
01840 LD B,128
01850 SENDP2 LD A,(HL)
01860 CALL 3BH
01870 INC HL
01880 DJNZ SENDP2
01890 RET
01900 LPRINT LD A,13 ;SEND CARRIAGE RETURN TO PRINTER
01910 CALL 3BH
01920 RET
01930 SETUP LD A,(A1) ;TAKES LINE OF SCREEN DATA AND
01940 ;CONVERTS IT INTO BIT IMAGE PRINTER DATA
01950 LD (PP),A
01960 LD IX,L1
01970 SET5 LD IX,DD
01980 LD A,(F1)
01990 LD B,A
02000 SET3 LD D,B
02010 LD A,(C1)
02020 LD C,A
02030 LD A,(PP)
02040 SUB C
02050 LD E,A
02060 PUSH BC
02070 PUSH DE
02080 PUSH HL
02090 CALL TEST
02100 POP HL
02110 POP DE
02120 POP BC
02130 JP Z,SET1
02140 LD A,(IX)
02150 ADD A,(IX)
02160 LD (IX),A
02170 SET1 INC IX
02180 INC B
02190 LD A,(F2)
02200 LD C,A
02210 LD A,B
02220 OR A
02230 CP C
02240 JP Z,SET2
02250 JP SET3
02260 SET2 LD A,(B1)
02270 LD C,A
02280 LD A,(PP)
02290 INC A
02300 OR A
02310 CP C
02320 JP Z,SET4
02330 INC IX
02340 LD (PP),A
02350 JP SET5
02360 SET4 RET
02370 STATUS LD A,(14312) ;CHECKS PRINTER STATUS
02380 CP 63
02390 RET Z
02400 LD A,B
02410 CP 5
02420 JP Z,STATUS
02430 LD HL,PMES
02440 LD DE,15360
02450 CALL WRITE
02460 LD B,5
02470 JP STATUS
02480 STSR4 LD A,(F2)
02490 LD (F1),A
02500 ADD A,7
02510 LD (F2),A
02520 RET
02530 LOAD LD HL,MES1 ;LOADS A SCREEN TO VIDEO
02540 LD DE,15360
02550 CALL WRITE
02560 CALL GETSNM
02570 CP 'Q'
02580 JP Z,RST1
02590 LD B,A
02600 LOAD2 LD HL,SCREEN-1024
02610 LD DE,1024
02620 LD1 ADD HL,DE
02630 LD1 DJNZ
02640 LD DE,15360
02650 LD BC,1024
02660 LD2 LD A,(HL)
02670 LD (DE),A

```


COMPUTRONICS INC.

•• EVERYTHING FOR YOUR TRS-80™ • ATARI™ • APPLE™ • PET™ • CP/M™ • XEROX™ • IBM™ • OSBORNE™ ••

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. • * ATARI is a trademark of Atari Inc. • * APPLE is a trademark of Apple Corp. • * PET is a trademark of Commodore • * CP/M is a trademark of Digital Research • * XEROX is a trademark of Xerox Corp. • * IBM is a trademark of IBM Corp. • * OSBORNE is a trademark of Osborne Corp.



BUSINESS PAC 100

100 Ready-To-Run Business Programs

(ON CASSETTE OR DISKETTE).....Includes 128 Page Users Manual.....

Inventory Control.....Payroll.....Bookkeeping System.....Stock Calculations.....

Checkbook Maintenance.....Accounts Receivable.....Accounts Payable.....

BUSINESS 100 PROGRAM LIST

NAME

DESCRIPTION

1 RULE78	Interest Apportionment by Rule of the 78's
2 ANNU1	Annuity computation program
3 DATE	Time between dates
4 DAYYEAR	Day of year a particular date falls on
5 LEASEINT	Interest rate on lease
6 BREAKVEN	Breakeven analysis
7 DEPRSL	Straightline depreciation
8 DEPRSY	Sum of the digits depreciation
9 DEPRDB	Declining balance depreciation
10 DEPRDDB	Double declining balance depreciation
11 TAXDEP	Cash flow vs. depreciation tables
12 CHECK2	Prints NEBS checks along with daily register
13 CHECKBK1	Checkbook maintenance program
14 MORTGAGE/A	Mortgage amortization table
15 MULTMON	Computes time needed for money to double, triple, etc.
16 SALVAGE	Determines salvage value of an investment
17 RRVARIN	Rate of return on investment with variable inflows
18 RRCONST	Rate of return on investment with constant inflows
19 EFFECT	Effective interest rate of a loan
20 FVAL	Future value of an investment (compound interest)
21 PVAL	Present value of a future amount
22 LOANPAY	Amount of payment on a loan
23 REGWITH	Equal withdrawals from investment to leave 0 over
24 SIMPDISK	Simple discount analysis
25 DATEVAL	Equivalent & nonequivalent dated values for oblig.
26 ANNUDEF	Present value of deferred annuities
27 MARKUP	% Markup analysis for items
28 SINKFUND	Sinking fund amortization program
29 BONDDVAL	Value of a bond
30 DEPLETE	Depletion analysis
31 BLACKSH	Black Scholes options analysis
32 STOCVAL1	Expected return on stock via discounts dividends
33 WARVAL	Value of a warrant
34 BONDDVAL2	Value of a bond
35 EPSEST	Estimate of future earnings per share for company
36 BETAALPH	Computes alpha and beta variables for stock
37 SHARPE1	Portfolio selection model-i.e. what stocks to hold
38 OPTWRITE	Option writing computations
39 RTVAL	Value of a right
40 EXPVAL	Expected value analysis
41 BAYES	Bayesian decisions
42 VALPRINF	Value of perfect information
43 VALADINF	Value of additional information
44 UTILITY	Derives utility function
45 SIMPLEX	Linear programming solution by simplex method
46 TRANS	Transportation method for linear programming
47 EOQ	Economic order quantity inventory model
48 QUEUE1	Single server queueing (waiting line) model
49 CVP	Cost-volume-profit analysis
50 CONDPFOT	Conditional profit tables
51 OPTLOSS	Opportunity loss tables
52 FQOQOQ	Fixed quantity economic order quantity model
53 FQOOWSH	As above but with shortages permitted
54 FQOQPB	As above but with quantity price breaks
55 QUEUECB	Cost-benefit waiting line analysis
56 NCFANAL	Net cash-flow analysis for simple investment
57 PROFIND	Profitability index of a project
58 CAP1	Cap. Asset Pr. Model analysis of project

59 WACC	Weighted average cost of capital
60 COMBAL	True rate on loan with compensating bal. required
61 DISCBAL	True rate on discounted loan
62 MERGANA	Merger analysis computations
63 FINRAT	Financial ratios for a firm
64 NPV	Net present value of project
65 PRINDLAS	Laspeyres price index
66 PRINDPA	Paasche price index
67 SEASIND	Constructs seasonal quantity indices for company
68 TIMETR	Time series analysis linear trend
69 TIMEMOV	Time series analysis moving average trend
70 FUPRINF	Future price estimation with inflation
71 MAILPAC	Mailing list system
72 LETWRT	Letter writing system-links with MAILPAC
73 SORT3	Sorts list of names
74 LABEL1	Shipping label maker
75 LABEL2	Name label maker
76 BUSBJD	DOE business bookkeeping system
77 TIMECLK	Computes weeks total hours from timeclock info.
78 ACCTPAY	In memory accounts payable system-storage permitted
79 INVOICE	Generate invoice on screen and print on printer
80 INVENT2	In memory inventory control system
81 TELDIR	Computerized telephone directory
82 TIMUSAN	Time use analysis
83 ASSIGN	Use of assignment algorithm for optimal job assign.
84 ACCTREC	In memory accounts receivable system-storage ok
85 TERMSPAY	Compares 3 methods of repayment of loans
86 PAYNET	Computes gross pay required for given net
87 SELLPR	Computes selling price for given after tax amount
88 ARBCOMP	Arbitrage computations
89 DEPRSF	Sinking fund depreciation
90 UPSZONE	Finds UPS zones from zip code
91 ENVELOPE	Types envelope including return address
92 AUTOEXP	Automobile expense analysis
93 INSFILE	Insurance policy file
94 PAYROLL2	In memory payroll system
95 DILANAL	Dilution analysis
96 LOANAFED	Loan amount a borrower can afford
97 RENTPRCH	Purchase price for rental property
98 SALELEAS	Sale-leaseback analysis
99 RRCONVBD	Investor's rate of return on convertible bond
100 PORTVAL9	Stock market portfolio storage-valuation program

- ☐ TRS-80 Cassette Version
- ☐ TRS-80 (Mod-I or III), Pet, Apple or Atari Versions
- ☐ TRS-80 Mod-II, IBM, Osborne and CP/M Versions

ADD \$3.00 FOR SHIPPING IN UPS AREAS
ADD \$4.00 FOR C.O.D. OR NON-UPS AREAS
ADD \$5.00 TO CANADA AND MEXICO
ADD PROPER POSTAGE OUTSIDE OF U.S., CANADA AND MEXICO

COMPUTRONICS
MATHEMATICAL APPLICATIONS SERVICE

50 N. PASCACK ROAD
SPRING VALLEY, NEW YORK 10977

ASK FOR OUR 64-PAGE CATALOG
DEALER INQUIRIES INVITED

NEW TOLL-FREE
ORDER LINE
(OUTSIDE OF N.Y. STATE)
(800) 431-2818



24 HOUR
ORDER
LINE



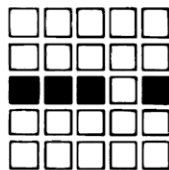
(914) 425-1535

ALL PRICES & SPECIFICATIONS SUBJECT TO CHANGE
DELIVERY SUBJECT TO AVAILABILITY

Listing continued

02680	DEC	BC		03750	JP	LIST1	
02690	INC	DE		03760	DRAW	LD	A,0 ;CHECKS FOR COMMANDS
02700	INC	HL		03770		LD	(N),A
02710	LD	A,B		03780		LD	(Y),A
02720	OR	C		03790		LD	(MD),A
02730	RET	Z		03800		CALL	LOAD
02740	JP	LD2		03810	DW1	LD	A,(15350)
02750	SAVE	CALL	TRANS ;SAVES VIDEO TO SCREEN BUFFER	03820		BIT	0,A
02760		LD	HL,MES2	03830		JP	Z,DW12
02770		LD	DE,15360	03840		LD	BC,1
02780		CALL	WRITE	03850		JP	DW13
02790		CALL	GETSNM	03860	DW12	LD	BC,4000
02800		LD	B,A	03870	DW13	CALL	60H
02810		LD	HL,SCREEN-1024	03880		CALL	2BH
02820		LD	DE,1024	03890		CP	'P'
02830	SV2	ADD	HL,DE	03900		JP	Z,MODEP
02840		DJNZ	SV2	03910		CP	'C'
02850		PUSH	HL	03920		JP	Z,MODEC
02860		CALL	TRANS2	03930		CP	'N'
02870		POP	HL	03940		JP	Z,MODEB
02880		LD	DE,15360	03950		CP	'S'
02890		LD	BC,1024	03960		JP	Z,SCRSAV
02900	SV3	LD	A,(DE)	03970		CP	'L'
02910		LD	(HL),A	03980		JP	Z,SCRDL
02920		DEC	BC	03990		CP	'Q'
02930		INC	HL	04000		JP	Z,QUIT
02940		INC	DE	04010		CP	'H'
02950		LD	A,B	04020		JP	Z,HELP
02960		OR	C	04030		CP	'F'
02970		RET	Z	04040		JP	Z,FILL
02980		JP	SV3	04050		CP	'I'
02990	TRANS	LD	HL,CURR ;MOVES VIDEO DATA INTO MEMORY	04060		JP	Z,INVER
03000			;TO MAKE WAY FOR A MESSAGE	04070		CP	'O'
03010		LD	DE,15360	04080		JP	Z,OUTPUT
03020		LD	BC,1024	04090		CP	'B'
03030	TR1	LD	A,(DE)	04100		JP	Z,BORDER
03040		LD	(HL),A	04110		CP	'A'
03050		DEC	BC	04120		JP	Z,SETXS
03060		INC	HL	04130		CP	'Z'
03070		INC	DE	04140		JP	Z,DRAWLN
03080		LD	A,B	04150		CP	'T'
03090		OR	C	04160		JP	Z,PACK
03100		RET	Z	04170		CP	'M'
03110		JP	TR1	04180		JP	Z,LETTER
03120	TRANS2	LD	HL,CURR	04190		CP	'D'
03130		LD	DE,15360	04200		RET	Z
03140		LD	BC,1024	04210		LD	A,(14450)
03150	TR2	LD	A,(HL)	04220		CP	128
03160		LD	(DE),A	04230		JP	Z,SETNB
03170		DEC	BC	04240		CP	8
03180		INC	HL	04250		JP	Z,NEGB
03190		INC	DE	04260		CP	16
03200		LD	A,B	04270		JP	Z,POSB
03210		OR	C	04280		CP	32
03220		RET	Z	04290		JP	Z,NEGN
03230		JP	TR2	04300		CP	64
03240	WRITE	CALL	01C9H ;DISPLAY MESSAGE ROUTINE	04310		JP	Z,POSN
03250	WRITE1	LD	A,(HL)	04320		CP	40
03260		CP	0	04330		JP	Z,NEGBN
03270		RET	Z	04340		CP	72
03280		LD	(DE),A	04350		JP	Z,PNNB
03290		INC	DE	04360		CP	48
03300		INC	HL	04370		JP	Z,NNPB
03310		JP	WRITE1	04380		CP	80
03320	GETSNM	INC	DE ;GET A NUMBER	04390		JP	Z,POSBN
03330	SNM1	LD	A,191	04400		CP	4
03340		LD	(DE),A	04410		JP	Z,RESNB
03350		PUSH	DE	04420	DW2	LD	A,(N)
03360		CALL	2BH	04430		CP	-1
03370		POP	DE	04440		JP	NZ,DW3
03380		OR	A	04450		LD	A,127
03390		JP	NZ,GOTC1	04460		LD	(N),A
03400		LD	A,128	04470	DW3	LD	A,(N)
03410		LD	(DE),A	04480		CP	128
03420		JP	SNM1	04490		JP	NZ,DW4
03430	GOTC1	CP	1	04500		LD	A,0
03440		JP	Z,RST1	04510		LD	(N),A
03450		LD	B,A	04520	DW4	LD	A,(Y)
03460		SUB	58	04530		CP	-1
03470		JP	P,GETSNM	04540		JP	NZ,DW5
03480		LD	A,B	04550		LD	A,47
03490		SUB	48	04560		LD	(Y),A
03500		JP	N,GETSNM	04570	DW5	LD	A,(Y)
03510		RET		04580		CP	48
03520	GETCHR	INC	DE ;GET ANY KEY	04590		JP	NZ,DW6
03530	CHR1	LD	A,191	04600		LD	A,0
03540		LD	(DE),A	04610		LD	(Y),A
03550		PUSH	DE	04620	DW6	LD	A,(MD)
03560		CALL	2BH	04630		CP	0
03570		POP	DE	04640		JP	NZ,DW7
03580		OR	A	04650		LD	A,(N)
03590		JP	NZ,CHR2	04660		LD	E,A
03600		LD	A,128	04670		LD	A,(Y)
03610		LD	(DE),A	04680		LD	D,A
03620		JP	CHR1	04690		CALL	TEST
03630	CHR2	CP	1	04700		JP	Z,DW61
03640		JP	Z,RST1	04710		LD	A,(N)
03650		RET		04720		LD	E,A
03660	L1SET	LD	HL,L1 ;RESETS LINE OF PRINTER DATA	04730		LD	A,(Y)
03670		LD	BC,300	04740		LD	D,A
03680	LIST1	LD	A,128	04750		PUSH	DE
03690		LD	(HL),A	04760		CALL	RESET
03700		INC	HL	04770		LD	BC,1000
03710		DEC	BC	04780		CALL	60H
03720		LD	A,B	04790		POP	DE
03730		OR	C	04800		CALL	SET
03740		RET	Z	04810		JP	DW1

Listing continued on p. 82



PERRY COMPUTERS

TRS-80 COMPUTERS
100% PURE RADIO SHACK

CALL TOLL-FREE 1-800-248-3823

TANDY 2000

	LIST PRICE	OUR PRICE
26-5103 Tandy 2000 Two Disk	\$2750.00	\$2175.00
26-5104 Tandy 2000 1 Disk and 10 Meg HD	\$4250.00	\$3475.00
26-5111 Monochrome Monitor	\$ 249.00	\$ 175.00
26-5112 Color Monitor	\$ 799.00	\$ 549.00
26-5140 Hi Res Graphic Monochrome Board	\$ 499.00	\$ 349.00
26-5141 Hi Res Color Graphics Chip	\$ 199.00	\$ 145.00
26-5160 Internal 128K Kit	\$ 299.00	\$ 250.00
26-5311 Microsoft Multiplan	\$ 195.00	\$ 166.00
26-5352 dBase II (Data Base)	\$ 595.00	\$ 420.00
26-5330 Multimate	\$ 249.00	\$ 205.00

TANDY 1200

	LIST PRICE	OUR PRICE
25-3000 Tandy 1200 1 Disk and 10 Meg HD	\$ 2999.00	\$ 2550.00
25-3010 VM-3 Green Monitor	\$ 219.00	\$ 185.00
26-3212 CM-2 Color Monitor	\$ 549.95	\$ 467.50
25-3040 Monochrome Display Adapter	\$ 219.00	\$ 185.00
25-3043 Graphics Display Adapter	\$ 299.00	\$ 255.00
25-3044 Graphics Master	\$ 695.00	\$ 590.00
25-3061 Captain Multifunction Board	\$ 795.00	\$ 675.00
25-3130 MSDOS/BASIC	\$ 89.95	\$ 76.50
25-3170 Wordstar Professional	\$ 395.00	\$ 335.00
25-3160 Framework	\$ 695.00	\$ 590.00

MODEL 4 COMPUTERS

	LIST PRICE	OUR PRICE
26-1069 Model 4 64K 2 Drive Computer	\$ 1299.00	\$ 950.00
26-1080 Model 4P 64K Portable Computer	\$ 1299.00	\$ 950.00
26-1122 64K Memory Expansion	\$ 79.95	\$ 75.00
26-1127 Model 4 Internal Drive 1	\$ 499.95	\$ 415.00
26-1123 Model 3to Model 4 Upgrade Kit	\$ 799.00	\$ 675.00
26-1084 Model 4P Modem Board	\$ 149.00	\$ 127.00
26-1595 Super Script Model 4	\$ 199.95	\$ 169.00
26-1635 Profile 4 Model 4	\$ 249.95	\$ 212.00
26-2216 CP/M Plus Model 4	\$ 149.00	\$ 127.00

BUSINESS COMPUTERS

	LIST PRICE	OUR PRICE
26-4005 Model 12 80K 2 Drive Computer	\$3999.00	\$2700.00
26-6004 Model 16B 256K 1 Drive Computer	\$4999.00	\$3175.00
26-6005 Model 16B 256K 2 Drive Computer	\$3999.00	\$3390.00
26-6006 Model 16B 256K 15Meg HD	\$5999.00	\$4750.00
26-6017 Card Cage For Model 12	\$ 199.00	\$ 169.00
26-4155 15 Meg Hard Drive Primary	\$2495.00	\$2000.00
26-4168 30 Meg Hard Drive Primary	\$3395.00	\$2885.00
26-4171 35 Meg Hard Drive Primary	\$3595.00	\$3055.00
26-4157 Installation Kit for Primary HD	\$ 495.00	\$ 410.00

MODEL 100 COMPUTERS

	LIST PRICE	OUR PRICE
26-3801 8K Model 100 Computer	\$ 399.00	\$ 339.00
26-3802 24K Model 100 Computer	\$ 599.00	\$ 509.00
26-3804 AC Adapter	\$ 5.95	\$ 5.00
26-3805 Acoustic Coupler	\$ 39.95	\$ 34.00
26-3816 8K RAM Memory Expansion Chip	\$ 119.95	\$ 95.00
26-1409 Printer Cable	\$ 14.95	\$ 12.70
26-1410 Modem Cable	\$ 19.95	\$ 17.00
26-3809 Briefcase	\$ 49.95	\$ 42.50
26-1183 Bar Code Reader	\$ 99.95	\$ 85.00
26-3806 Disk Video Interface	\$ 799.00	\$ 660.00

COLOR COMPUTERS

	LIST PRICE	OUR PRICE
26-3127 64K Extended Color Computer 2	\$ 199.95	\$ 169.00
26-3136 16K Extended Color Computer 2	\$ 139.95	\$ 120.00
26-3029 Disk Drive for Color Computer	\$ 349.95	\$ 295.00
26-1161 Disk Drive 1, 2, 3, for Color Computer	\$ 279.95	\$ 230.00
26-3018 Extended Basic Kit	\$ 39.95	\$ 34.00
26-3030 OS-9 With Editor Assembler	\$ 69.95	\$ 59.50
VIP Writer		\$ 59.00
VIP Calc		\$ 49.00
Teletwriter Disk		\$ 59.00
Botek Interface		\$ 57.00

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
26-1271 DMP-110 50/25 cps Printer	\$ 399.00	\$ 299.00
26-1255 DMP-120 Printer 120cps Matrix	\$ 499.00	\$ 385.00
26-1257 DWP-210 14cps Daisy Wheel	\$ 599.00	\$ 485.00
26-1277 DMP-430 24 Wire Matrix Printer	\$ 899.00	\$ 745.00
26-1270 DWP-510 43cps Daisy Wheel	\$1495.00	\$1225.00
26-1274 DMP-2100P 24 Wire DOT Matrix	\$1995.00	\$1650.00

OTHER MAJOR BRANDS

COMPUTERS	OUR PRICE	PRINTERS	OUR PRICE
Sanyo	\$ Call	Epson	\$ Call
Columbia	\$ Call	C. Itoh	\$ Call
Epson	\$ Call	Okidata	\$ Call
Franklin	\$ Call	Star (Gemini)	\$ Call
Software	\$ Call	Hayes Modems	\$ Call

FOR ORDERS CALL 1-800-248-3823

We also carry a complete line of computer accessories
(Please call for current prices.)

FOR INFORMATION CALL 1-517-625-4161

All prices and offers may be changed or withdrawn without notice. Advertised prices are cash prices. For shipping, add 2% (minimum shipping charge \$3.00). C.O.D. accepted. (\$4.00 charge per carton on C.O.D. Call for further C.O.D. information.) M.C., Visa, A.X. add 3%.

124

PERRY COMPUTERS 137 N. MAIN, PERRY, MI. 48872

COMPLETE HARD DRIVE \$795.

AS SEEN AT THE RADIO SHACK
COMPUTER SHOWCASES

TRS-80 Model 1/3/4 and 4P Primary

5 Megabyte -	795.00
10 Megabyte -	1095.00
15 Megabyte -	1295.00
30 Megabyte -	1895.00

Secondary

595.00
895.00
1095.00
1695.00

(Model 1 add 50.00)

TRS - 80 Hard Disk Subsystem Features

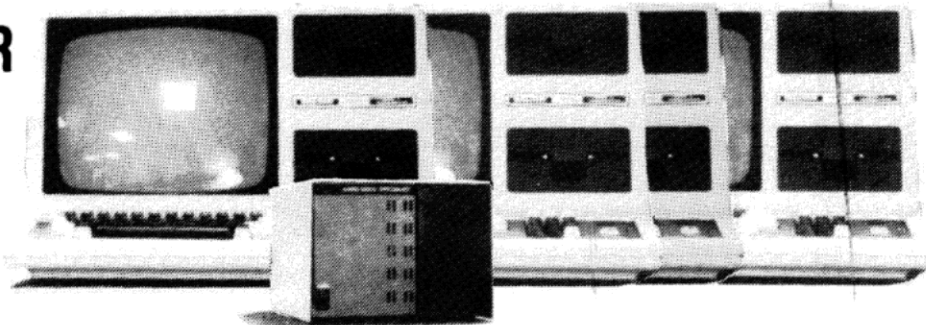
- All sizes rated after formatting.
- TRS-80 Models 1, 3, 4, and 4P full supported.
- Your choice of DOSPLUS, LDOS, or TRSDOS 6.x Software Drivers included.
- Newdos 80/Version 2.5 Systems available.
- Up to two secondary drives may be added.
- Error checking and correcting controller.
- Buffered seek drives for improved access times.
- Built-in power up diagnostics.
- Drives use plated media for long disk life.
- Heavy duty power supply.
- Fan cooled.
- Gold connectors used throughout for high reliability.
- 30 day money back guarantee.
- 1 year warranty.

Shop and compare. Hard Drive Specialist has been building hard drive systems for years and have sold thousands of subsystems to satisfied TRS-80 customers. We fully support TRS-80 Models 1/3/4 and 4P computers on all available hard drive operating systems. We use the latest state-of-the-art drives and controllers. Our drives all use buffered seek logic and plated media to result in almost one-fourth the average access times found on our competitors drives. Plated media results in longer platter life and high resistance to head crashes not found on coated media drives. We utilize high reliability construction throughout including: heavy duty power supply, cooling fan, and gold connectors. We back up our drives with a one year parts and labor warranty and we're so sure you'll like our systems we offer a thirty day money back, no questions asked, guarantee. So when it comes time to buy, look beyond the price and choose the best drive. After all, we are the Hard Drive Specialist!



HDS MULTIPLEXER

\$1295.



ALLOWS USAGE OF UP TO 4 MODEL III OR IV SYSTEMS USING DOSPLUS OR LDOS ON A HDS HARD DRIVE. INCLUDES MASTER CONTROL UNIT, HOST ADAPTERS FOR 2 COMPUTERS, AND 40 FEET OF CABLE. EACH ADDITIONAL HOST ADAPTER ADD \$150. EACH ADDITIONAL FOOT OF CABLE ADD \$1. UP TO 100 FEET PER COMPUTER.

TRSDOS 6.X and DOSPLUS IV supported now!

NEW! Tandy 1000, Tandy 1200, IBM, Zenith, and Compaq Fixed Disk Drives

10 Megabyte - Internal	— \$ 895.
10 Megabyte - External	— \$1195.
15 Megabyte - External	— \$1695.
30 Megabyte - External	— \$2195.
10 Megabyte - Secondary	— \$ 895.
15 Megabyte - Secondary	— \$1395.
30 Megabyte - Secondary	— \$1895.



MODEL 3/4 BOOT ROM \$39.95

ALLOWS YOU TO BOOT DIRECTLY FROM YOUR HARD DRIVE FOR DOSPLUS

Hard Drive Software

Dosplus 3.4f (Model 1 only) \$99.95
Dosplus 3.5e (Model 1 drivers for 3.5) \$59.95
Dosplus 3.5f (Model 3/4 drivers for 3.5) \$59.95
Dosplus IVf (Model 4 drivers for IV) \$59.95
Dosplus 4.0a (Model 3/4 only) \$99.95
LDOS (tm) 5.1 x Drivers (Model 1/3/4) \$59.95
TRSDOS 6.0 (tm) Drivers (Model 4 only) \$59.95
Newdos/80 Version 2.5 (Model 1/3/4) \$199.00

455

HARD DRIVE SPECIALIST

Ordering Information

Use our Watts Line to place your order Via Visa, MasterCard, or Wire Transfer. Or Mail your payment directly to us. Any non-certified funds are held until proper clearance is made. C.O.D. 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 which are custom built. UPS ground is our standard means of shipping unless otherwise specified. Shipping costs are available upon request.

1-713-480-6000 Order Line 1-800-231-6671
16206D Hickory Knoll, Houston, Texas 77059

DISK TERM VERY SMART TERMINAL

Terminal Mode: Transmit an ASCII file from memory or disk Programmable for unattended execution. Receive a file, write to disk when buffer is full, clear buffer and repeat, all unattended. File can even span disks.

Transmit and Receive Protocol: Separate from terminal. Allows transmission of multiple files of any type. Completely programmable for unattended operation at both ends. Even redials if no carrier.

Other Features:

- Menu Driven
- DOS commands from program
- Supports auto-dial modems
- XON & XOFF changeable
- Operates under DOSPLUS, LDOS, NEWDOS/80, TRSDOS
- Prepare files off-line then upload
- Telephone Directory for auto-dial with modem settings
- Store all settings in configuration files
- Model 3 & 4 transmit and receive at up to 9600 baud
- Auto log-on
- Translation Tables
- Printer buffer .25K to 2.5K
- Programmable Macro-keys

Model 4 enhancements: Full 80 x 24 screen. Has split screen option to separate data received and transmitted. Able to use second 64K for buffer.

Model 1, III, & 4 **\$69.00**

Add \$3.00 Postage / Check, Money Order, Visa, & Mastercard
Indiana Residents add 5% Sales Tax

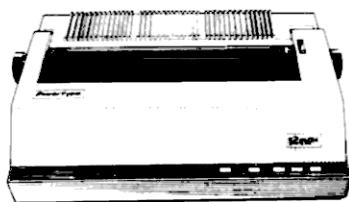
INDIANA SOFTWARE DEVELOPMENT CO.

(Division of DonTho Computer Service, Inc.)
723 Franklin Square, Suite 502 • Michigan City, IN 46360

Phone: (219) 879-2941

✓ 425

Star's PowerType Daisywheel



\$ 329

PowerType. Its features are executive quality, yet "type-writer friendly"!

- There's bi-directional typing of 96 crisp characters at 18 cps • A simple drop-in ribbon cassette • Carriage acceptance of letterhead and legal size, fanfold and roll paper
- Right and left margin settings • Vertical and horizontal tabs • Plus, virtually universal parallel & serial interfacing.

SUNLOCK SYSTEMS

210 CONNOR ROAD
MECHANICSVILLE, VIRGINIA 23111

ADDITIONAL PRINTER SPECIALS

Epson	Okidata	Comrex II	\$389	Citoh 8510	\$349
RX80	ML82	Comrex III	629	Citoh F10	899
80FT 289	ML83	Gemini 10X	269	Sv.Reed 500	379
RX100 399	ML84	Gem.PrType	329	Sv.Reed 550	449
FX80 419	ML92	Gem.Radx10	519	Man/Tal 80	269
FX100 589	ML93	SCM L-1000	399	LQ 1500P	1149

TO ORDER CALL TOLL FREE 800-368-9191

In Virginia call 804-746-1600

We accept MasterCard, Visa and CODs

✓ 456

NEW FOR
PROFILE® USERS

PROfix * III™ RESTRUCTURE & TRANSFER UTILITY \$49.95

For PROFILE® III PLUS
Model III/4

Needs change—Experience teaches—and if you could redefine your data base today, you probably would change a few things—

WELL, NOW YOU CAN!

PROfix*III Provides you, as a user of Profile III Plus, with a powerful, easy-to-use package that allows you to reorganize your data base TO MEET TODAY'S NEEDS, and then moves your existing data into your new file structure.

• • • FEATURES • • •

- EASY TO USE—no special charts to fill out
- FAST—assembly language speed
- RE-ARRANGE FIELDS—even across segments
- DROP OR ADD FIELDS
- 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

Plus \$2.50 for Handling and Postage

Check, M.O., VISA/MC
(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)

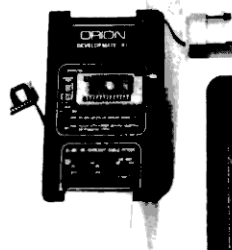
Profile is a registered trademark of Tandy Corp.

✓ 186

CONVERT YOUR TRS-80 MODEL III OR 4 INTO A DEVELOPMENT SYSTEM

Now you can develop Z-80 based, stand-alone devices such as games, robots, instruments and peripheral controllers, by using your TRS-80 as a development system. The DEVELOPMATE plugs into the expansion connector of your TRS-80 and adds **PROM PROGRAMMING** and **IN-CIRCUIT-EMULATION** capabilities to your system.

Complete instructions and sample schematics are included to help you design your own simple stand-alone microcomputer systems. THESE SYSTEMS CAN BE AS SIMPLE AS FOUR ICs: one TTL circuit for clock and reset, a Z-80, an EPROM, and one peripheral interface chip.



When the In-Circuit-Emulation cable is plugged into the Z-80 socket of your stand-alone system, the system becomes a part of your TRS-80. You can use the full power of your editor/ assembler to debug and trace programs to check out both the hardware and the software. Simple test loops can be used to check out the hardware, then the system program can be run to debug the logic of your stand-alone device.

Since the program is kept in TRS-80 RAM, changes can be made quickly and easily. When your stand-alone device works as desired, you use the DEVELOPMATE's PROM PROGRAMMER to copy the program into a PROM. With this PROM, and a Z-80 in place of the emulation cable, your stand-alone device will work by itself.

The DEVELOPMATE is extremely compact. Both the PROM programmer and the In-Circuit-Emulator are in one small plastic box only 3 1/2" x 5 1/4". A line-plug mounted power supply is included. The PROM programmer has a personality module which defines the voltages and connections of the PROM so that future devices can be accommodated. However, the system comes with a "universal" personality module which handles 2758, 2508(8K), 2716, 2516(16K), 2532(32K), as well as the new electrically alterable 2816 and 48016(16K EEPROMs).

The COMPLETE DEVELOPMATE 83 with software, power supply, emulation cable, TRS-80 cable, and "universal" personality module, is ONLY \$329!

PM2 PERSONALITY MODULE for 2732A EPROM \$15

PM3 PERSONALITY MODULE for 2764 EPROM \$15

ORION INSTRUMENTS

172 Otis Avenue Dept. M Woodside, CA 94062
(415) 851-1172

Master Charge and Visa phone orders accepted
California residents please add sales tax.

✓ 151


```

04820 DW61 LD A,(N)
04830 LD E,A
04840 LD A,(Y)
04850 LD D,A
04860 CALL SET
04870 LD BC,1000
04880 CALL 60H
04890 LD A,(N)
04900 LD E,A
04910 LD A,(Y)
04920 LD D,A
04930 CALL RESET
04940 JP DW1
04950 DW7 CP 1
04960 JP NZ,DW8
04970 LD A,(N)
04980 LD E,A
04990 LD A,(Y)
05000 LD D,A
05010 PUSH DE
05020 CALL SET
05030 LD BC,1000
05040 CALL 60H
05050 POP DE
05060 CALL RESET
05070 JP DW1
05080 DW8 CP 2
05090 JP NZ,DW1
05100 LD A,(N)
05110 LD E,A
05120 LD A,(Y)
05130 LD D,A
05140 PUSH DE
05150 CALL RESET
05160 LD BC,1000
05170 CALL 60H
05180 POP DE
05190 CALL SET
05200 JP DW1
05210 SCRLD CALL LOAD
05220 JP DW1
05230 SCRSV CALL SAVE
05240 JP DW1
05250 FILL LD A,(N) ;FILL IN A FIGURE
05260 LD E,A
05270 LD A,(Y)
05280 LD D,A
05290 LD (BUF2),SP
05300 TRYL PUSH DE
05310 LD A,E
05320 CP 1
05330 JP C,TRYU
05340 DEC E
05350 CALL TEST
05360 JP NZ,TRYU
05370 POP HL
05380 JP TRYL
05390 TRYU POP DE
05400 PUSH DE
05410 LD A,D
05420 CP 1
05430 DEC D
05440 CALL TEST
05450 JP NZ,STACK
05460 POP HL
05470 JP TRYL
05480 STACK POP DE
05490 PUSH DE
05500 PUSH DE
05510 INC E
05520 CALL TEST
05530 JP NZ,SKIP1
05540 INC D
05550 CALL TEST
05560 JP Z,SKIP1
05570 DEC E
05580 CALL TEST
05590 JP Z,TRYR
05600 SKIP1 POP DE
05610 TRYR POP DE
05620 PUSH DE
05630 LD A,E
05640 CP 127
05650 JP NC,TRYD
05660 INC E
05670 CALL TEST
05680 JP NZ,TRYD
05690 DEC E
05700 CALL SET
05710 INC E
05720 POP HL
05730 JP TRYL
05740 TRYD POP DE
05750 PUSH DE
05760 LD A,D
05770 CP 47
05780 JP NC,UNSTCK
05790 INC D
05800 CALL TEST
05810 JP NZ,UNSTCK
05820 DEC D
05830 CALL SET
05840 INC D
05850 POP HL
05860 JP TRYL
05870 UNSTCK POP DE

```

```

05880 CALL SET
05890 XOR A
05900 LD HL,(BUF2)
05910 SBC HL,SP
05920 JP Z,DW1
05930 POP DE
05940 JP TRYL
05950 QUIT CALL TRANS ;QUIT?
05960 LD HL,MES3
05970 LD DE,15360
05980 CALL WRITE
05990 CALL GETCHR
06000 CP 'Y'
06010 JP Z,402DH
06020 CALL TRANS2
06030 JP DW1
06040 BORDER LD A,(N) ;DRAW OR ERASE A BORDER
06050 LD B,A
06060 LD A,(Y)
06070 LD C,A
06080 PUSH BC
06090 LD A,0
06100 LD (N),A
06110 BOR1 LD A,(N)
06120 LD E,A
06130 LD D,0
06140 CALL SETBOR
06150 LD A,(N)
06160 LD E,A
06170 LD D,47
06180 CALL SETBOR
06190 LD A,(N)
06200 INC A
06210 CP 128
06220 JP Z,BOR2
06230 LD (N),A
06240 JP BOR1
06250 BOR2 LD A,0
06260 LD (Y),A
06270 BOR3 LD A,(Y)
06280 LD D,A
06290 LD E,0
06300 CALL SETBOR
06310 LD A,(Y)
06320 LD D,A
06330 LD E,127
06340 CALL SETBOR
06350 LD A,(Y)
06360 INC A
06370 CP 48
06380 JP Z,BOR4
06390 LD (Y),A
06400 JP BOR3
06410 BOR4 POP BC
06420 LD A,B
06430 LD (N),A
06440 LD A,C
06450 LD (Y),A
06460 JP DW1
06470 SETBOR LD A,(ND)
06480 CP 1
06490 JP Z,RESET
06500 JP SET
06510 HELP CALL TRANS ;DISPLAY COMMAND MENU
06520 LD HL,MES4
06530 LD DE,15360
06540 CALL WRITE
06550 CALL GETCHR
06560 CALL TRANS2
06570 JP DW1
06580 LETTER CALL TRANS ;DISPLAY A LETTER FORM
06590 LD HL,MES6
06600 LD DE,15360
06610 CALL WRITE
06620 CALL GETCHR
06630 LD D,A
06640 LD HL,CTAB
06650 LET1 LD A,D
06660 CP (HL)
06670 JP Z,LET2
06680 LD A,(HL)
06690 CP 0
06700 JP NZ,LET3
06710 CALL TRANS2
06720 JP DW1
06730 LET3 INC HL
06740 JP LET1
06750 LET2 PUSH DE
06760 CALL TRANS2
06770 LD A,(Y)
06780 LD B,0FFH
06790 LOP1 INC B
06800 SUB 3
06810 JP P,LOP1
06820 ADD A,3
06830 SLA A
06840 LD C,A
06850 LD L,B
06860 LD H,0
06870 LD B,6
06880 LOP2 ADD HL,HL
06890 DJNZ LOP2
06900 LD D,0
06910 LD A,(N)
06920 LD E,A
06930 SRL E

```


Tidbit # 18

Here's an Assembly-language program that converts Mark Goodwin's disk drive timer program ("Keeping Time," September 1984, p. 72) for the Model I.

```
00100 ;DISK DRIVE TIMER FOR THE MODEL I. ORIGINAL CODE WRITTEN
00110 ;FOR THE MODEL 3 AND APPEARED IN THE SEPTEMBER 1984 ISSUE
00120 ;OF 80 MICRO, WRITTEN BY MARK GOODWIN.
00130 ;THE FOLLOWING LINES NEED TO BE CHANGED OR ADDED.
00140 CMD EQU 37E0H ;FDC STATUS ADDRESS
00150 SEL EQU 37E1H ;FDC DRIVE SELECT ADDRESS
00160 RDSPLY EQU 4467H ;DISPLAY LINE VECTOR ADDRESS
00170 ORG 7000H ;RE-ORGED TO 7000H (WAS 5000H)
00180 JF C,MAIN6 ;Jump if it is.
00190 LD BC,06H ;THIS OFFSET MUST BE ADDED WHEN USING
00200 ADD HL,BC ;4467H FOR THE DISPLAY ROUTINE.
00210 LD BC,06H ;ADD DISPLACEMENT VALUE - SAME AS
00220 ADD HL,BC ;ABOVE COMMENT.
00230 JF NZ,MAIN1 ;Jump if a key was pressed.
00240 LD (HL),91 ;91 IS THE MODEL 1 UP ARROW
00250 CALL RDSPLY ;JP CHANGED TO CALL FOR MOD 1
00260 RET ;ADDED TO MAINTAIN STACK INTEGRITY
00270 SELECT0 LD A,(CMD) ;WAS "IN" FOR MOD 3 VERSION
00280 LD (SEL),A ;WAS "OUT" FOR MOD 3 VERSION
00290 LD (SEL),A ;WAS "OUT" FOR MOD 3 VERSION
00300 LD (CMD),A ;WAS "OUT" FOR MOD 3 VERSION
00310 LD A,(CMD) ;WAS "IN" FOR MOD 3 VERSION
00320 LD HL,2900H ;REQUIRED OFFSET FOR MOD 1 1.77 MHZ CLOCK
00330 LD (SEL),A ;WAS "OUT" FOR MOD 3
00340 LD (CMD),A ;WAS "OUT" FOR MOD 3
00350 GETSP1 LD A,(CMD) ;WAS "IN" FOR MOD 3
00360 GETSP2 LD A,(CMD) ;WAS "IN" FOR MOD 3
00370 NOP ;ADDED TO ADJUST TIMING
00380 LD A,(CMD) ;WAS "IN" FOR MOD 3
00390 NOP ;ADDED TO ADJUST TIMING
00400 LD A,(CMD) ;WAS "IN" FOR MOD 3
00410 MESS0 DEFM 'Model I Disk Timer V1.2 (P. Eriksen 9/84)'
00420 MESS1 DEFM 'MOD 3 (c) 83 M. Goodwin Copyright'
```

Paul E. Eriksen
Newark, DE

TRS-80®

TRS-80 Radio Shack Computers

TRS-80 4P 2 Disk Drive 64K	\$975.00
TRS-80 16B 2 Disk Drive 256K	\$3625.00
TANDY 2000 2 Disk Drive 128K	\$2175.00
TANDY 2000 W 10 Megabyte Hard Disk	\$3350.00
TANDY VM-1 Monochrome Monitor	\$170.00
TANDY CM-1 Color Monitor	\$575.00
DMP-400 Printer	\$575.00
DWP-410 Printer	\$647.00
Daisy Wheel II Reg. \$1995.00	\$998.00

**Huge Savings Up To 30%
On
Printers • Computers
Other Radio Shack Items**

CASHIERS CHECK
OR
MONEY ORDER
MUST ACCOMPANY ALL
ORDERS!

**B
M Computers**
Box 66

806-653-5961 Follett, Texas 79034

NEW PRINTERS ADDED! FIND YOURS BELOW.
Good This Month

RIBBON SALE

EXACT REPLACEMENTS

RADIO SHACK • CENTRONICS • COMMODORE • EPSON • ANADIX • BASE 2 • IBM • NEC • C. ITOH • DEC • OKIDATA • OTHERS

PRINTER MAKE, MODEL NUMBER (Contact us if your printer is not listed. We can probably RELOAD your old cartridges.)	RIBBON SIZE Inches by Yards	INSERTS EZ-LOAD™ DROPIN, NO WINDING! EXACT REPLACEMENTS made in our own shop cartridges not included	RELOADS You SEND your used CARTRIDGES to us. We put OUR NEW INSERTS in them	NEW CARTRIDGES (from the various manufacturers. Subject to availability. *)	SILVER DOLLAR WIND TO LOAD WHY DO WE SELL THESE? This is the type ribbon you get if you order from our fel- low advertisers. We sell them for less since we make them ourselves. Do you really like the mess and inconvenience of unwinding and dumping this type ribbon into a waste- basket or out on a newspaper and/or winding it into your cartridge? We don't know why these are being sold. Com- puters should simplify your life, not make it more com- plex just to save a few pen- nies. You are welcome to order these if you cannot af- ford our EZ-LOAD™ IN- SERTS, RELOADS, or NEW CARTRIDGES. BUT BEWARE! You now know how to avoid disappointment. One more caution: be sure to check the length of any ribbon BEFORE you buy it. For instance, an MX 100 ribbon should be 30 yards long, not 20 as in the MX 80
BASE 2 - DIP 81/82/84/85 - MPI 88/89/GX	1/2x20	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more	\$20/2 \$57/6 \$ 99/12	
C ITOH Prowriter 1550/8510 - NEC 8023/8025	1/2x18	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more	\$15/2 \$42/6 \$ 78/12	
C ITOH Starwriter F10 CARBON FILM BLACK DIABLO HYTYPE II A FABRIC BLACK	5/16 5/16x17	\$24/6 \$42/12 \$234/72 \$21/3 \$78/12 \$510/72	\$5 ea 3-11 \$4 ea 12 or more \$8/1 \$7 ea 2 or more	\$18/3 \$60/12 \$348/72 \$18/2 \$51/6 \$ 96/12	
OKIDATA-PACEMARK 2350-2410 Black -MICROLINE ML80/82/83/92/93	1/2x100 1/2x16	\$30/3 \$108/12 \$576/72	\$20/1 \$18 ea 2 or more	\$32 Each Spool \$38/12	
RADIO SHACK MICROLINE ML84	1/2x40			Spool \$ 84/12	
CARBON FILM - DWP-210 Black (1445)	5/16x145	\$24/6 \$42/12 \$234/72	\$5 ea 3-11 \$4 ea 12 or more	\$18/3 \$60/12 \$348/72	
DAISY WII-DWP-410-510 Black (1419)	1/4x145	\$24/6 \$42/12 \$234/72	\$5 ea 3-11 \$4 ea 12 or more	\$18/3 \$60/12 \$348/72	
Red, Green, Blue, Brown Colors (1419)	1/4x130	\$30/6 \$54/12 \$288/72	\$6 ea 3-11 \$5 ea 12 or more	\$21/3 \$72/12 \$420/72	
FABRIC (Long-Life) DWP-210 Black (1458)	5/16x17	\$21/3 \$78/12 \$510/72	\$8/1 \$7 ea 2 or more	\$18/2 \$51/6 \$ 96/12	
DAISY WII-DWP-410/510 Black (1449)	1/4x25	\$21/3 \$78/12 \$510/72	\$8/1 \$7 ea 2 or more	\$18/2 \$51/6 \$ 96/12	
LPI-II-IV CENTRONICS 730/737/739/779 (1413)	9/16x16	\$12/3 \$45/12 \$252/72			
DMP-200,120,430 (1296) (1483)	1/2x20	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more	\$27/2 \$81/6 \$162/12	
DMP-500 (1482)	1/2x20	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more	\$24/2 \$72/6 \$144/12	
DMP-2100 - TOSHIBA P1340,1350,51 (1442)	1/2x20	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more	\$15/2 \$42/6 \$ 78/12	
DMP-100, LP VII-Commodore 1525, Gorilla Banana (1424)	Inker Load			\$16/2 \$48/6 \$ 96/12	
LP III-V (1414)	1/2x15	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more	\$15/2 \$42/6 \$ 78/12	\$12/3 \$44/12 \$252/72
DMP-400/420, LP VI-VIII (1418)	5/16x14	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more	\$15/2 \$42/6 \$ 78/12	\$11/3 \$40/12 \$228/72
EPSON-LQ 1500	1/2x14	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more	\$22/2 \$63/6 \$120/12	
-MX/FX/RX 70/80 - IBM PC	1/2x20	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more	\$14/2 \$36/6 \$ 66/12	\$12/3 \$44/12 \$252/72
-MX/FX/RX 100 - IBM PC	1/2x30	\$18/3 \$66/12 \$360/72	\$8/1 \$7 ea 2 or more	\$18/2 \$51/6 \$ 96/12	\$15/3 \$54/12 \$288/72
COMMODORE 8023-P - CENTRONICS 152-2	1/2x12	\$15/3 \$54/12 \$288/72	\$7/1 \$6 ea 2 or more		
ANADIX 9000 Series	1/2x30	\$18/3 \$66/12 \$360/72	\$8/1 \$7 ea 2 or more		

WORRIED ABOUT ORDERING BY MAIL? Relax. We've been in business for many years and can please the smallest and largest ac-
counts. You receive some of the finest ribbons available made of our own exclusive IMAGE PLUS +™ fabric and carbon film. Our rib-
bons fit your printer exactly. COMPARE, but BEWARE! We order all our competitor's products and are amazed at what we get. We use
the latest state-of-the-art production equipment and are blessed with a fine, dedicated staff. We guarantee everything we make,
period. Our ribbons are made fresh daily and our goal is to ship your order within 24 hours. Write for our brochure and price list.

BtC

President

SEND CHECK, MONEY ORDER, OR C O D TO



BCCOMPCO
800 South 17 Box 246
SUMMERSVILLE, MO 65571
(417) 932-4196



WE PAY UPS SHIPPING on PREPAID ORDERS
PLEASE INCLUDE STREET ADDRESS for UPS DELIVERY
FOREIGN ADD 15% U.S. FUNDS

Listing continued

```

06940      JP      NC,CON2
06950      INC      C
06960      CON2    ADD      HL,DE
06970      LD      DE,3C00H
06980      ADD      HL,DE
06990      PUSH     HL
07000      POP      IX
07010      POP      DE
07020      LD      A,D
07030      LARGEC   LD      IX,CTAB
07040      LAR20    CP      (IX)
07050      INC      IX
07060      JP      NZ,LAR20
07070      PUSH     IX
07080      POP      HL
07090      LD      BC,CTAB+1
07100      OR      A
07110      SBC      HL,BC
07120      PUSH     HL
07130      POP      IX
07140      ADD      IX,IX
07150      ADD      IX,IX
07160      ADD      IX,IX
07170      LD      BC,DOTTAB
07180      ADD      IX,BC
07190      CALL     MATSR
07200      LD      BC,60
07210      ADD      IX,BC
07220      CALL     MATSR
07230      JP      DW1
07240      MATSR   LD      B,4
07250      MAT10   LD      A,(IX)
07260      SET      7,A
07270      LD      (IX),A
07280      INC      IX
07290      INC      IX
07300      DJNZ     MAT10
07310      RET
07320      PACK   CALL     TRANS ;PACK SCREENS TOGETHER
07330      CALL     LOAD
07340      LD      HL,CURR
07350      LD      BC,1024
07360      LD      DE,15360
07370      PACK2   LD      A,(DE)
07380      OR      (HL)
07390      LD      (DE),A
07400      DEC      BC
07410      INC      DE
07420      INC      HL
07430      LD      A,B
07440      OR      C
07450      JP      Z,DW1
07460      JP      PACK2
07470      SETXS   LD      A,(N) ;SAVE FIRST POINT ON LINE
07480      LD      (XS1),A
07490      LD      A,(Y)
07500      LD      (YS1),A
07510      JP      DW1
07520      DRAWLN  LD      A,(N) ;AUTOLINE
07530      LD      E,A
07540      LD      (XS2),A
07550      LD      A,(Y)
07560      LD      D,A
07570      PUSH     DE
07580      LD      (YS2),A
07590      DRWLN   LD      A,(XS1)
07600      LD      B,A
07610      LD      A,(XS2)
07620      SUB      B
07630      LD      (DX),A
07640      LD      A,(YS1)
07650      LD      B,A
07660      LD      A,(YS2)
07670      SUB      B
07680      LD      (DY),A
07690      LD      A,(DX)
07700      OR      A
07710      JP      P,DRWL2
07720      JP      Z,DRWL3
07730      LD      B,1
07740      JP      DRWL4
07750      DRWL2   LD      B,-1
07760      JP      DRWL4
07770      DRWL3   LD      B,0
07780      DRWL4   LD      A,B
07790      LD      (XPLUS),A
07800      LD      A,(DY)
07810      OR      A
07820      JP      P,DRL2
07830      JP      Z,DRL3
07840      LD      A,1
07850      JP      DRL4
07860      DRL2    LD      A,-1
07870      JP      DRL4
07880      DRL3    LD      A,0
07890      DRL4    LD      (YPLUS),A
07900      LD      A,(DX)
07910      OR      A
07920      JP      P,DRL5
07930      LD      B,A
07940      LD      A,0
07950      SUB      B
07960      LD      (DX),A
07970      DRL5     LD      A,(DY)
07980      OR      A
07990      JP      P,DRL6
08000      LD      B,A

```

```

08010      LD      A,0
08020      SUB      B
08030      LD      (DY),A
08040      DRL6     LD      A,(DX)
08050      LD      (CRDX),A
08060      DRL7     LD      A,(DY)
08070      LD      B,A
08080      LD      A,(CRDX)
08090      SUB      B
08100      JP      P,DRL8
08110      LD      A,(YPLUS)
08120      LD      B,A
08130      LD      A,(Y)
08140      ADD      A,B
08150      LD      (Y),A
08160      LD      A,(CRDX)
08170      LD      B,A
08180      LD      A,(DX)
08190      ADD      A,B
08200      LD      (CRDX),A
08210      DRL9     JP      DRL9
08220      DRL8     LD      (CRDX),A
08230      LD      A,(XPLUS)
08240      LD      B,A
08250      LD      A,(N)
08260      ADD      A,B
08270      LD      (N),A
08280      DRL9     LD      A,(N)
08290      LD      E,A
08300      LD      A,(Y)
08310      LD      D,A
08320      LD      A,(MD)
08330      CP      1
08340      JP      Z,DRL91
08350      CALL     SET
08360      JP      DRL92
08370      DRL91   CALL     RESET
08380      DRL92   LD      A,(N)
08390      LD      B,A
08400      LD      A,(XS1)
08410      CP      B
08420      JP      NZ,DRL7
08430      LD      A,(Y)
08440      LD      B,A
08450      LD      A,(YS1)
08460      CP      B
08470      JP      Z,DRL10
08480      JP      DRL7
08490      DRL10   POP      DE
08500      LD      A,E
08510      LD      (N),A
08520      LD      A,D
08530      LD      (Y),A
08540      JP      DW1
08550      OUTPUT  CALL     TRANS ;SAVE OR LOAD DISK FILES
08560      LD      HL,MES10
08570      LD      DE,15360
08580      CALL     WRITE
08590      CALL     GETCHR
08600      CP      'S'
08610      JP      Z,OUTSAV
08620      CP      'L'
08630      JP      Z,OUTLOD
08640      JP      DW1
08650      OUTSAV  CALL     FILENM
08660      LD      HL,BUFFER
08670      LD      DE,DCB
08680      LD      B,128
08690      CALL     4420H
08700      JP      NZ,DSKERR
08710      CALL     TRANS2
08720      LD      A,1
08730      LD      (CRFL),A
08740      LD      HL,15360-128
08750      OUTSV3  LD      DE,128
08760      ADD      HL,DE
08770      LD      A,(CRFL)
08780      CP      9
08790      JP      Z,OUTSV5
08800      LD      DE,DCB
08810      CALL     4439H
08820      LD      A,(CRFL)
08830      INC      A
08840      LD      (CRFL),A
08850      JP      OUTSV3
08860      OUTSV5  LD      DE,DCB
08870      CALL     4420H
08880      JP      NZ,DSKERR
08890      CALL     TRANS2
08900      JP      DW1
08910      OUTLOD  CALL     FILENM
08920      LD      HL,BUFFER
08930      LD      DE,DCB
08940      LD      B,128
08950      CALL     4424H
08960      JP      NZ,DSKERR
08970      LD      A,1
08980      LD      (CRFL),A
08990      LD      HL,15360-128
09000      OUTLD1  LD      DE,128
09010      ADD      HL,DE
09020      LD      DE,DCB
09030      CALL     4436H
09040      JP      NZ,DSKERR
09050      LD      A,(CRFL)
09060      CP      8
09070      JP      Z,DW1

```

Listing continued

Listing continued

```

09080 INC A
09090 LD (CRFL),A
09100 JP OUTLD1
09110 DSKERR OR 80H
09120 CALL 4409H
09130 CALL TRANS2
09140 JP DW1
09150 FILENM LD HL,MES11
09160 LD DE,15424
09170 CALL WRITE
09180 LD B,8
09190 LD HL,DCB
09200 CALL 40H
09210 RET
09220 INVER LD BC,0 ;INVERSE DISPLAY
09230 IN1 PUSH BC
09240 LD D,B
09250 LD E,C
09260 CALL TEST
09270 JP NZ,IN2
09280 POP BC
09290 PUSH BC
09300 LD D,B
09310 LD E,C
09320 CALL SET
09330 JP IN4
09340 IN2 POP BC
09350 PUSH BC
09360 LD D,B
09370 LD E,C
09380 CALL RESET
09390 IN4 POP BC
09400 INC B
09410 LD A,B
09420 CP 48
09430 JP NZ,IN1
09440 LD B,0
09450 INC C
09460 LD A,C
09470 CP 128
09480 JP Z,DW1
09490 PUSH BC
09500 CALL 2BH
09510 CP ' '
09520 JP Z,DW1
09530 POP BC
09540 JP IN1
09550 MODEP LD A,2
09560 LD (MD),A

```

```

09570 JP DW2
09580 MODEC LD A,1
09590 LD (MD),A
09600 JP DW2
09610 MODEB LD A,0
09620 LD (MD),A
09630 JP DW2
09640 NEGB LD A,(Y)
09650 DEC A
09660 LD (Y),A
09670 JP DW2
09680 POSB LD A,(Y)
09690 INC A
09700 LD (Y),A
09710 JP DW2
09720 NEGN LD A,(N)
09730 DEC A
09740 LD (N),A
09750 JP DW2
09760 POSN LD A,(N)
09770 INC A
09780 LD (N),A
09790 JP DW2
09800 NEGBN LD A,(Y)
09810 DEC A
09820 LD (Y),A
09830 LD A,(N)
09840 DEC A
09850 LD (N),A
09860 JP DW2
09870 PNNB LD A,(N)
09880 INC A
09890 LD (N),A
09900 LD A,(Y)
09910 DEC A
09920 LD (Y),A
09930 JP DW2
09940 NNPB LD A,(N)
09950 DEC A
09960 LD (N),A
09970 LD A,(Y)
09980 INC A
09990 LD (Y),A
10000 JP DW2
10010 POSBN LD A,(N)
10020 INC A
10030 LD (N),A
10040 LD A,(Y)
10050 INC A

```

Listing continued

• **DISPLAYS CORRECT SPELLINGS:** If you don't know the correct spelling, 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.

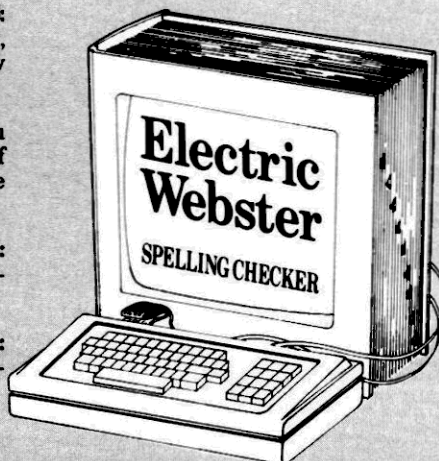
• **HYPHENATES AUTOMATICALLY:** (Optional). Inserts discretionary hyphens throughout text.

• **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:** into 12 different word processing programs: WordStar, Spellbinder, Palantir, NewScript, Lazy Writer, SuperScript, Script, Electric Pencil, CopyArt, Superscript, Zorlof, and LeScript (specify). Begins proofing at the stroke of a key; returns you to word processing automatically.



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

VOTED #1: For the second straight year, Electric Webster was voted the #1 spelling checker in the 80 Micro Reader's Choice Awards. (1/83, 1/84)

"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.

ACCLAIMED:

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

"Now there's a program called Electric Webster that would let me write to Presidents and Kings and never feel embarrassed. Miss Mulberry would give Electric Webster an A+, and so will you." *Computer User*, 1/84

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

LOW PRICES:

TRS-80 Electric Webster	\$ 89.95
w/Correcting Feature	\$149.95
Hyphenation	\$ 49.95
Grammar & Style Checker	\$ 49.95
CP/M, PC/DOS or MODEL 2000	
Electric Webster	\$209.95
(with Correcting Feature)	
Hyphenation Option	Included*
Grammar & Style Option	Included*

*Limited Time Only



**CORNUCOPIA
SOFTWARE**

(415) 524-8098

Post Office Box 6111 Albany, California 94706

Listing continued

```

10060 LD (Y),A
10070 JP DW2
10080 SETNB LD A,(N)
10090 LD E,A
10100 LD A,(Y)
10110 LD D,A
10120 CALL SET
10130 JP DW2
10140 RESNB LD A,(N)
10150 LD E,A
10160 LD A,(Y)
10170 LD D,A
10180 CALL RESET
10190 JP DW2
10200 FIRSCR CALL 01C9H ;
DISPLAY INTRO SCREEN
10210 LD HL,FIR1
10220 LD DE,15360
10230 CALL WRITE
10240 CALL 49H
10250 RET
10260 SET LD A,0C6H ;
SET, RESET, AND TEST SUBS.
10270 JR TEST10
10280 RESET LD A,86H
10290 JR TEST10
10300 TEST LD A,46H
10310 TEST10 LD (INST+1),A
10320 PUSH DE
10330 ADDRESS LD A,D
10340 LD B,0PFH
10350 LOOP INC B
10360 SUB 3
10370 JP P,LOOP
10380 ADD A,3
10390 SLA A
10400 LD C,A
10410 LD L,B
10420 LD H,0
10430 LD B,6
10440 LOOP1 ADD HL,HL
10450 DJNZ LOOP1
10460 LD D,0
10470 SRL E
10480 JR NC,CONT
10490 INC C
10500 CONT ADD HL,DE
10510 LD DE,3C00H
10520 ADD HL,DE
10530 SLA C

```

```

10540 SLA C
10550 SLA C
10560 LD A,(INST+1)
10570 ADD A,C
10580 LD (INST+1),A
10590 INST DEFB 0CBH
10600 DEFB 0
10610 SET 7,(HL)
10620 POP DE
10630 RET
10640 MES1 DEFM 'Which screen would you like loaded?'
10650 DEFB 0
10660 MES2 DEFM 'Which screen would you like saved?'
10670 DEFB 0
10680 MES3 DEFM 'Do you want to quit (Y/N)?'
10690 DEFB 0
10700 MES4 DEFM '
Menu
Arrows move cursor
'D) - Send figures to printer H) - Help Menu
'P) - Print mode C) - Clear mode N) - Neutral mode
'S) - Save screen-buffer L) - Load screen-b
'I) - Inverse video M) - Letter forms
'T) - Pack screens O) - Output to dis
'A) - Set first point for AUTOLINE Z) - Draw line to
'F) - Fill enclosure B) - Draw border
Q) - Quit
Press ANY key
Printer Graphics
Program by 14 year old Jeff Reifman
'An entry in 1984-1985 80 Micro'
39
's Young Programmers'
39
'Contest!'
Press ANY key
'Available characters: ABCDEFGHIJKLMNOPQRSTUVWXYZ?I-(space)
'Which character would you like?'
0
'Which 3 screens would you like printed (in order)?'

```

Listing continued

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

Listing continued

```

10950      DEFB      0
10960 MES10  DEFB      'Would you like to load or save a screen (L/S)?'
10970      DEFB      0
10980 PHES   DEFB      'Printer not ready!'
10990      DEFB      0
11000 MES11  DEFB      'What is the name of this file (8-char.)?'
11010      DEFB      0
11020 QUMES  DEFB      'Will you be using large or small print format?'
11030      DEFB      '1=Small print      2=Large print'
11040      DEFB      0
11050 LGMES  DEFB      'Which screen would you like?'
11060      DEFB      0
11070 BUFFER DEFS      256
11080 DCB    DEFS      8
11090      DEFB      0DH
11100      DEFS      350
11110 CRFL   DEFB      0
11120 CTAB   DEFB      'ABCDEFGHIJKLMNOPQRSTUVWXYZ -?!'
11130 DOTTAB DEFB      22      ;A
11140      DEFB      3
11150      DEFB      3
11160      DEFB      41
11170      DEFB      23
11180      DEFB      3
11190      DEFB      3
11200      DEFB      43
11210      DEFB      55      ;B
11220      DEFB      51
11230      DEFB      51
11240      DEFB      25
11250      DEFB      53
11260      DEFB      48
11270      DEFB      48
11280      DEFB      26
11290      DEFB      23      ;C
11300      DEFB      3
11310      DEFB      3
11320      DEFB      11
11330      DEFB      53
11340      DEFB      48
11350      DEFB      48
11360      DEFB      56
11370      DEFB      23      ;D
11380      DEFB      3
11390      DEFB      3
11400      DEFB      41
11410      DEFB      53
11420      DEFB      48
11430      DEFB      48
11440      DEFB      26
11450      DEFB      23      ;E
11460      DEFB      3

```

```

11470      DEFB      3
11480      DEFB      3
11490      DEFB      55
11500      DEFB      51
11510      DEFB      51
11520      DEFB      48
11530      DEFB      23      ;F
11540      DEFB      3
11550      DEFB      3
11560      DEFB      3
11570      DEFB      23
11580      DEFB      3
11590      DEFB      3
11600      DEFB      1
11610      DEFB      23      ;G
11620      DEFB      3
11630      DEFB      3
11640      DEFB      11
11650      DEFB      53
11660      DEFB      48
11670      DEFB      48
11680      DEFB      59
11690      DEFB      21      ;H
11700      DEFB      0
11710      DEFB      0
11720      DEFB      42
11730      DEFB      23
11740      DEFB      3
11750      DEFB      3
11760      DEFB      43
11770      DEFB      0      ;I
11780      DEFB      43
11790      DEFB      23
11800      DEFB      0
11810      DEFB      0
11820      DEFB      58
11830      DEFB      53
11840      DEFB      0
11850      DEFB      0      ;J
11860      DEFB      0
11870      DEFB      0
11880      DEFB      43
11890      DEFB      52
11900      DEFB      48
11910      DEFB      48
11920      DEFB      58
11930      DEFB      21      ;K
11940      DEFB      0
11950      DEFB      32
11960      DEFB      6
11970      DEFB      23
11980      DEFB      3
11990      DEFB      3

```

Listing continued

NEW

COPYCAT 3

NOW YOU CAN DUPLICATE VIRTUALLY ALL OF YOUR TRS-80 DISKETTES

COPYCAT 3 will allow you to make an exact duplicate of virtually all of your diskettes even if they are protected. And this includes your games and utilities. COPYCAT 3 automatically analyzes, formats, copies and verifies each track of the diskette you are duplicating. The entire process is amazingly fast, typically less than 70 seconds and even less with verify turned off.

COPYCAT 3 is intended for your personal use only, in making backup copies of your protected software.

COPYCAT 3 will run on the TRS-80 Model 3, 4 or 4P computers.

COPYCAT 3 \$49.95

*Please add \$2.00 for postage and handling. CA residents add 6% sales tax.
All orders are normally shipped the next business day via first class mail.*

OMNISOFTECH RESEARCH

2170 W. Broadway, #501A

Anaheim, CA 92804

(714) 772-5000

Dealer inquiries on your letterhead are welcomed.



✓36

Listing continued

12000	DEFB	36		12490	DEFB	23;R		12980	DEFB	48
12010	DEFB	21	;L	12500	DEFB	3		12990	DEFB	48
12020	DEFB	0		12510	DEFB	3		13000	DEFB	6
12030	DEFB	0		12520	DEFB	41		13010	DEFB	24
12040	DEFB	0		12530	DEFB	23		13020	DEFB	3
12050	DEFB	53		12540	DEFB	3		13030	DEFB	3
12060	DEFB	48		12550	DEFB	3		13040	DEFB	36
12070	DEFB	48		12560	DEFB	41		13050	DEFB	21;Y
12080	DEFB	48		12570	DEFB	23;S		13060	DEFB	0
12090	DEFB	31;M		12580	DEFB	3		13070	DEFB	0
12100	DEFB	16		12590	DEFB	3		13080	DEFB	42
12110	DEFB	32		12600	DEFB	3		13090	DEFB	3
12120	DEFB	47		12610	DEFB	51		13100	DEFB	43
12130	DEFB	21		12620	DEFB	51		13110	DEFB	23
12140	DEFB	2		12630	DEFB	51		13120	DEFB	3
12150	DEFB	1		12640	DEFB	59		13130	DEFB	3;Z
12160	DEFB	42		12650	DEFB	3;T		13140	DEFB	3
12170	DEFB	23;N		12660	DEFB	43		13150	DEFB	51
12180	DEFB	36		12670	DEFB	23		13160	DEFB	15
12190	DEFB	0		12680	DEFB	3		13170	DEFB	60
12200	DEFB	42		12690	DEFB	0		13180	DEFB	51
12210	DEFB	21		12700	DEFB	42		13190	DEFB	48
12220	DEFB	0		12710	DEFB	21		13200	DEFB	48
12230	DEFB	9		12720	DEFB	0		13210	DEFW	0
12240	DEFB	58		12730	DEFB	21;U		13220	DEFW	0
12250	DEFB	22;O		12740	DEFB	0		13230	DEFW	0
12260	DEFB	3		12750	DEFB	0		13240	DEFW	0
12270	DEFB	3		12760	DEFB	42		13250	DEFW	0;-
12280	DEFB	41		12770	DEFB	53		13260	DEFW	0
12290	DEFB	37		12780	DEFB	48		13270	DEFB	3
12300	DEFB	48		12790	DEFB	48		13280	DEFB	3
12310	DEFB	48		12800	DEFB	58		13290	DEFB	3
12320	DEFB	26		12810	DEFB	21;V		13300	DEFB	3
12330	DEFB	23;P		12820	DEFB	0		13310	DEFB	7;?
12340	DEFB	3		12830	DEFB	0		13320	DEFB	35
12350	DEFB	3		12840	DEFB	42		13330	DEFB	51
12360	DEFB	43		12850	DEFB	2		13340	DEFB	59
12370	DEFB	23		12860	DEFB	36		13350	DEFB	0
12380	DEFB	3		12870	DEFB	24		13360	DEFB	34
12390	DEFB	3		12880	DEFB	1		13370	DEFB	17
12400	DEFB	3		12890	DEFB	21;W		13380	DEFB	0
12410	DEFB	22;Q		12900	DEFB	40		13390	DEFB	0;!
12420	DEFB	3		12910	DEFB	20		13400	DEFB	42
12430	DEFB	3		12920	DEFB	42		13410	DEFB	21
12440	DEFB	41		12930	DEFB	37		13420	DEFW	0
12450	DEFB	37		12940	DEFB	58		13430	DEFB	34
12460	DEFB	48		12950	DEFB	53		13440	DEFB	17
12470	DEFB	56		12960	DEFB	26		13450	DEFB	0
12480	DEFB	26		12970	DEFB	9;X		13460	END	START

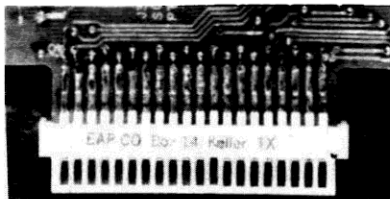
End

Gold Plug 80

TRS-80+ MOD I, III, COCO,
TIMEX 1000, OSBORNE,
T199/4a others

Eliminate disk reboots and data loss due to oxidized contacts at the card edge connectors.
GOLD PLUG 80 solders to the board edge connector. Use your existing cables. (if gold plated)

GOLD PLUG 80 Mod I Mod III



GOLD PLUG 80 Mod I (6)	\$44.95
Keyboard/EI (mod I)	15.95
Individual connectors	\$7.95
GOLD PLUG 80 Mod III (6)	48.95
Internal 2 Drive Cable	29.95
Mod III Expansion port	9.95

new
SPECIAL PRICE

Available at your favorite dealer or order direct from **E.A.P. CO.**

Dealer Inquiries Invited

USA shipping \$1.45
Foreign \$7

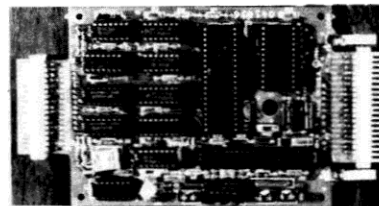
Can/Mex \$4
TEXAS 5% TAX



+ trademark Tandy Corp

COCO MODULE INSTALLATION AVAILABLE

COCO Disk Module



Ground tab extensions

COCO Disk Module (2)	\$16.95
Ground tab extensions	INCL
Disk Drives (all R.S.)	\$7.95
Gold Disk Cable 2 Drive	29.95
Four Drive Cable	39.95

new
SPECIAL PRICE

Model I, III/4

PERCOM HARD DISK

5 Mb Hard Disk \$ 995.00

10 Mb Hard Disk \$1450.00

SYNCOM DISKETTES \$17.95/10
(SINGLE SIDED DOUBLE DENSITY)

GOLD PLUG 80-E.A.P. COMPANY

P.O. Box 14 Keller, TX 76248 (817) 498-4242



Verbatim.
3M IBM



TOLL FREE 1-800-321-3552
IN OHIO & OTHER INQUIRIES 216-481-5515

Star **NEC**

SANYO

OKIDATA EPSON

Datalife

TAVA PC

KAYPRO II

BASF



**IF ANYTHING
BEATS OUR SELECTION,
IT'S OUR PRICES!**

YOUR REFERENCE GUIDE FOR TANDY 1000 - IBM - IBM COMPATIBLES

UPGRADES

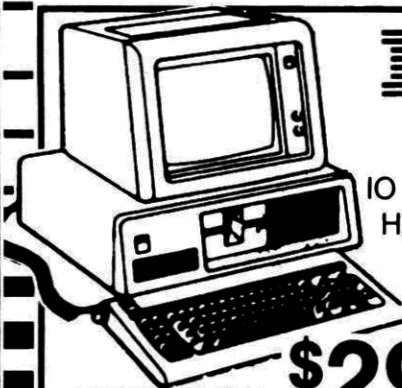
64K Memory 4164'S	\$ 39.95
16K 4116, 200NS	17.95
AST Six Pack Plus 0K	225.00
AST Six Pack Plus 64K	278.00
Quadram Quadboard 0K	219.00
Quadram Quadboard 64K	269.00
Quadram Quadcolor	219.00
Persyst Graphics Brd	229.00
Persyst Mono/Parallel	249.00
Hercules Graphics Board	359.00
Techmar Color/Parallel	339.00

MONITORS

Amdek 300 Green	\$149.00
Amdek 300 Amber	159.00
Amdek 310 Amber	199.00
Zenith 122A	109.00
Zenith 124A	159.00
Quadram Quadchrome	
RGB	499.00
Taxan 420 RGB	499.00

MODEMS

Hayes Smartmodem 300	\$229.00
Hayes Smartmodem 1200	549.00
Hayes Smartmodem 1200B	469.00
Hayes Micromodem IIe	269.00
Volkmodem	69.00
Signalman Mark VII	109.00
Signalman Mark XII	299.00
Popcom X100	399.00
Popcom C100	379.00



IBM
PCX
10 MEGABYTE
HARD DRIVE

NOW ONLY

\$2995

Includes MDS controller, 10 megabyte hard drive and memory, CPU, IBM keyboard, 256K RAM, mono/-parallel board, monitor and single 320K floppy drive. Easily expandable.

SANYO

The MBC 555-1

\$1199

System Package
INCLUDES...

Sugg. Retail Price	Sugg. Retail Price
MSDOS	\$60
SPELLSTAR	\$250
MAILMERGE	\$250
CALSTAR	\$250
INFOTAR	\$495
WORDSTAR	\$495
\$2999 VALUE	

Features include 8088 Microprocessor, 128K RAM expandable to 256 RAM, parallel printer port, graphics capability, game paddle port, 8087 math co-processor port. Also available with double-sided disk drives — \$1359.00.

SOFTWARE-IBM

DBase II	\$329.00
DBase II - DBase III Upgrade	150.00
DBase III	499.00
Framework	499.00
Dollars & Sense	129.00
Flight Simulator	39.00
Knoware	79.00
Lotus 123	329.00
Lotus 123 - Symphony Upgrade	150.00
Lotus Symphony	499.00
MasterType	39.00
Microsoft Word w/Mouse	319.00
Multimate	329.00
Open Access	389.00
PFS:Access	69.00
PFS:File	99.00
PFS:Proof	69.00
PFS:Report	99.00
PFS:Write	99.00
RBase 4000	349.00
RBase Clout	145.00
RBase Extended Report	109.00
Wordstar	239.00

DRIVES

TEAC 55A 40 TRK	\$149.00
TEAC 55B 40/40 TRK	199.00
Tandon TM100-1 40 TRK	149.00
Tandon TM100-2 40/40 TRK	219.00
Tandon TM100-4 80/80 TRK	319.00
Datamac 10 Megabyte	999.00
Datamac 30 Megabyte	1949.00
10 Meg Internal Drive w/Controller	895.00

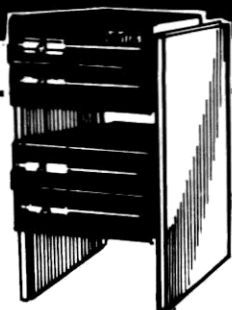
WE'RE GIVING
MAIL ORDER
A GOOD NAME!

DATA SUPPLIES

A SUBSIDIARY OF THE COMPUTER WAREHOUSE, INC. OF OHIO

22295 Euclid Ave.
Euclid, Ohio 44117

IF ANYTHING
BEATS OUR
SELECTION
IT'S OUR PRICES!



As low as
\$199

DISKIT III™

**MODEL III & IV DISK UPGRADE
WITH TANDON DRIVES!**

**NOW ADD UP TO 4
INTERNAL DISK DRIVES TO A
RADIO SHACK MODEL 3 &
MODEL 4. UP TO 1.3
MEGABYTES OF DISK
STORAGE!**

- Gold Plated Edge Connectors • Metal Disk Drive Brackets • All Hardware and Cables • Switching Power Supply • 1 hour or less for installation • 40 80 Track supported • Single Dual Head supported • 100% compatible • No Soldering needed • 180 days warranty on Controller.

DISKIT III w/o Drives \$199.00

DISKIT III

w/one Teac 55A 40 Track Drive \$345.00

DISKIT III

w/two Teac 55A 40 Track Drive \$495.00

DISKIT III

w/two Teac 55B 40/40 Dual Drive ... \$595.00

ADD \$10.00 EA. FOR TANDON DRIVES



TOLL FREE 1-800-321-3552
IN OHIO & OTHER INQUIRIES 216-481-5515



BULK DISKETTES

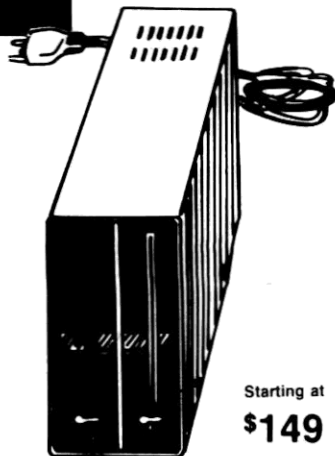
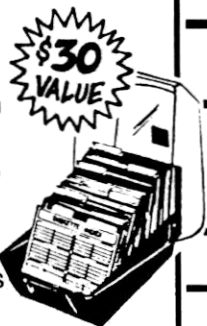
SSSD
IN
QUANTITIES
OF 200
OR MORE

99¢ ea.

SSDD \$1.29

FREE FLIP FILE

With purchase
of 100
SSDD Diskettes
at 1.29 ea.



Starting at
\$149

BARE DISK DRIVES

The extremely reliable Teac slim-line now requires half the power plus includes our exclusive 6-month double extended MFR warranty. (Was 3 months).

- TEAC 5 1/4" 55A 40 TRK \$149
- TEAC 5 1/4" 55B 40/40 TRK ... \$199
- Tandon TM100-1 40 TRK \$149
- Tandon TM100-2 40/40 TRK ... \$219
- Tandon TM100-4 80/80 \$319

PRINTER BUFFERS FOR MOST COMPUTERS QUADRAM MICROFAZER

Parallel to Parallel w/8K \$149.00
Parallel to Serial w/8K \$179.00
Serial to Serial w/8K \$179.00
Serial to Parallel w/8K \$179.00
Each Add's 8K Upgrade \$ 10.00

All come with pause control and copy feature, and can be upgraded to 512K.

SPRINTER

Double Your Speed

Speed-up cuts computer operation time in half, saves time and money. Fast 4 MHz Z80B CPU included, installs in 15 minutes with no soldering or cutting.

SPRINTER III for MOD III \$109.95

SPRINTER I for MOD I \$109.95

TANDON DRIVES REPAIRED

\$29⁹⁵

PLUS PARTS
& SHIPPING

DRIVE PARTS FOR TANDON, TEAC, MPI
CALL FOR PRICES!

MODEL III & IV RS-232 Communication

Direct replacement for RS-2332, fully tested and burned in, easy installation, 120 day warranty.

RS-232 \$59.95

MODEL IV — 64K MEMORY EXPANSION

Guaranteed 1 full year
Set of 8

4164 RAM CHIPS \$39.95

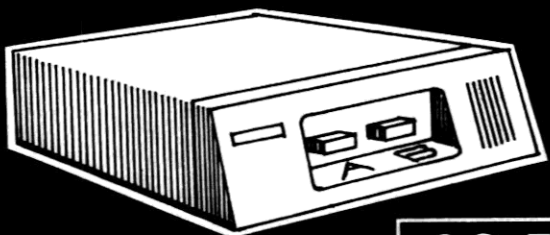
w/PAL CHIP to go from

64 to 128K \$64.95

16 K RAM SPECIAL MEMORY UPGRADE

4116, 200ns. Guaranteed one full year.
\$17.95

NOW ONLY \$11.95
with the purchase of \$25 or
more! (while supply lasts)



COMREX CR 700 PRINTER SWITCHING DEVICE

\$59⁹⁵

Now you can change between printers or devices with the push of a button. You can plug two printers into your computer or any other parallel device with the new Comrex CR 700 Switching device.

DATA SUPPLIES

22295 Euclid Ave.
Euclid, Ohio 44117

A SUBSIDIARY OF THE COMPUTER WAREHOUSE, INC. OF OHIO



TOLL FREE 1-800-321-3552

IN OHIO & OTHER INQUIRIES 216-481-5515

ORGANIZE AND PROTECT



ROLLTOP 100

Disk File Model #RT100

Twice the capacity (100 - 5 1/4" Disks) of the leading "flip top" file. It includes 10 diskette dividers and anti-skid feet. An outstanding design \$36.00
Locking Model #RT100L \$46.00

**FREE BOX
OF DISKETTES**
WITH PURCHASE OF PAC 100
Limited Time Only!

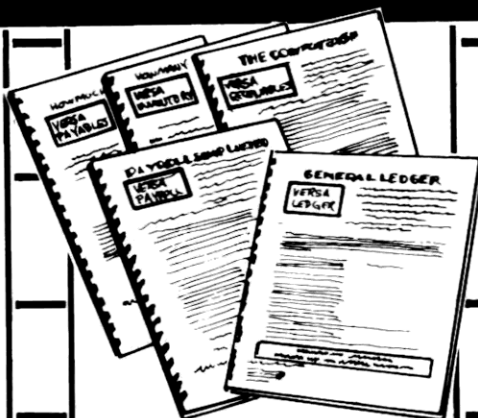
BUSINESS PAC 100

READY-TO-RUN
BUSINESS PROGRAMS

\$99⁹⁵

INCLUDES

128 Page Users Manual • Inventory Control • Payroll • Bookkeeping System • Stock Calculations • Checkbook Maintenance • Accounts Receivable • Accounts Payable.
PLUS 90 MORE!



VERSABUSINESS SERIES

The Most Powerful Business Software Ever!

Model I, III & IV

Each Versabusiness module can be purchased and used independently or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES \$84.95

A complete menu-driven accounts receivable, invoicing and monthly statement generating system. Keeps track of all information relating to who owes you or your company money and can provide automatic billing for past due accounts.

VERSAPAYABLES \$84.95

Designed to keep track of current and aged payables, keeping you in touch with all the information regarding how much money your company owes and to whom.

VERSAPAYROLL \$84.95

Powerful and sophisticated yet easy to use! Complete employee records are maintained and all necessary payroll calculations are performed automatically.

VERSAINVENTORY \$84.95

Just what you need to maintain complete control of your inventory system. Gives you instant access to data on any item. Keeps track of all information related to what items are in stock, etc.

VERSALEDGER II \$129.95

This complete accounting system grows with your business. Can function as a simple personal checkbook register, a small business bookkeeping system or a large corporate general ledger system!



ELECTRIC WEBSTER

w/correcting feature \$119.00
Hyphenation feature \$ 39.00
Grammatical feature \$ 39.00

COMPLETE SYSTEM

All four programs \$189.00

"Cadillac" of Spelling Checkers

80 Micro 9/82.

Available on Model I, III & IV

NewsScript

7.1 \$99.95

With Labels \$114.95

LeScript **\$104⁹⁵**

Model I, Model III, & IV
LNW-80, PMC-80 MAX-80.

NEWDOS/80 Version 2.0

MOD I or III \$89.95

NEWDOS/80 Version 2.25

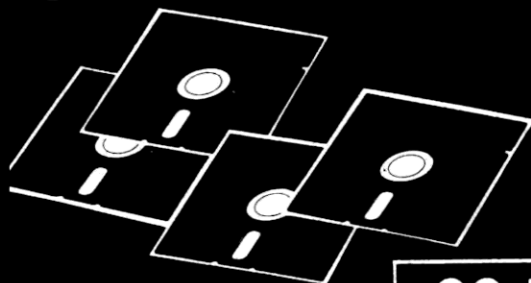
For Hard Drives \$129.

Let your TRS-80™ Test Itself With
**THE FLOPPY DOCTOR &
MEMORY DIAGNOSTIC**

Disk Drive & Memory Diagnostic Program
by David Stambaugh

For MODEL I \$24.00

For MODEL III \$26.00



Verbatim

DATALIFE Premium Diskettes at Affordable Prices

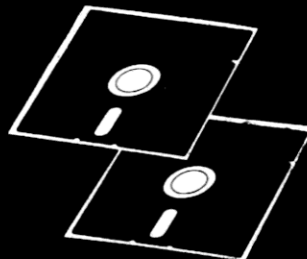
5 1/4" MD525-01 IS/D Den (box of 10) **\$19.95**

Special Savings! Soft-Sector Diskettes

5 1/4" 2S/D Den (MD550-01) **\$31.95**

5 1/4" 2S/4 Den (MD557-01) **\$49.90**

8" 1S/D Den (FD34-8000) **\$43.95**



DATA SUPPLIES

22295 Euclid Ave.
Euclid, Ohio 44117

A SUBSIDIARY OF THE COMPUTER WAREHOUSE, INC. OF OHIO





TOLL FREE 1-800-321-3552

IN OHIO & OTHER INQUIRIES 216-481-5515



If Anything Beats Our Selection . . . It's Our Prices. Look no further if you're shopping for rock bottom prices and fast personal service. When you call M.D.S. you receive the fastest delivery available anywhere. We now have a bigger and better facility to serve you in the most efficient way possible. Call us, you'll be glad you did.

Russ Krotto



EPSON

RX80

\$269

- 100 cps
- Tractor paper feed
- 128 Typstyles
- 7 graphic modes
- Proportional space
- 10" carriage

EPSON

FX100

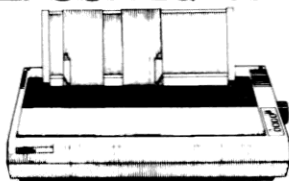
\$659

- 160 cps
- Tractor paper feed
- 128 Typstyles
- 7 graphic modes
- Proportional space
- 15" carriage

EPSON FX80

160 CPS, 10" carriage... **\$449**

EPSON LQ 1500



includes parallel interface, 200 CPS, bi-directional, sheet feeders available. **\$1199**

THE HOME ACCOUNTANT

The #1 best selling program for home and small business accounting is now available for TRS-80 Model 3. handles up to 99 accounts, five checkbooks, multiple income accounts, and can split transactions to any number of accounts. Prints net worth statements, income statements, as well as custom designed reports. Displays a bar chart and trend for any selected category. (by Continental Software, requires Model 3, 2 drives, 48K) .

\$62.95

THE WAIT IS OVER

CP/M

Exclusively for the
Model 4
Montezuma Micro

Now, for the first time, you can unleash the powerful features resident in your MODEL 4 computer.

- Includes INTERCHANGE: a utility that allows reading, writing and copying 20 different manufacturer's disk formats such as IBM, KAYPRO, OSBORNE, XEROX, etc.
- Complete with the following CP/M utilities: ASM, DDT, DUMP, ED, LOAD, PIP, STAT and SYSGEN.
- Includes MODEM 7, a powerful public domain communications program for file transfer and remote data base access.
- Supports 80 x 24 video, reverse video, direct cursor addressing and more.
- Utilizes the Model 4 function keys and allows user defined keys.
- Auto execute command for turnkey applications.
- FORMAT utility permits up to 52 disk formats to be constructed, all menu drive.

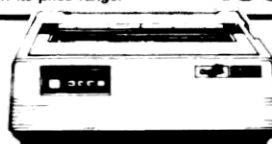
\$159.95



OKIDATA 92

The most advanced dot matrix printer in its price range.

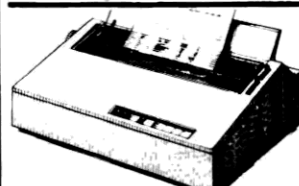
\$439



OKIDATA 93

- 160 cps
- Tractor paper feed
- Proportional space
- 15" carriage

\$679



COMREX II

13 CPS Printer **\$439**

COMREX III	\$689
STAR GEMINI 15	\$449
STAR DELTA 10	\$479
OKIDATA 82	\$349
OKIDATA 93	\$679
OKIDATA 84	\$799
NEC 8023	\$399
NEC 2030	\$899
NEC 3530	\$1599
BROTHER HR 15	\$459
BROTHER HR 25	\$699
BROTHER HR 35	\$959
PANSONIC 1090	\$299
PANSONIC 1091	\$349

WE ACCEPT

- Visa
- Mastercard
- Checks
- Money Orders
- C.O.D.

MOST SCHOOL, GOVT. AND FORTUNE 1000 CO. P.O.'S ACCEPTED
Add 3% Serv. Chg.
Min. order \$50

ADD \$3.00 FOR SHIPPING & HANDLING
\$6.00 Extra for C.O.D. Orders
Ohio Residents
Add 6 1/2% Sales Tax

3M

5 1/4" 1S/DD/SS - Box of 10 **\$19.95**
5 1/4" 2S/DD/SS - Box of 10 **\$31.95**
Purchase 10 boxes of disks and you pay only **\$18.95 per box.**

DATA SUPPLIES

A SUBSIDIARY OF THE COMPUTER WAREHOUSE, INC. OF OHIO

22295 Euclid Ave.
Euclid, Ohio 44117

**MAIL ORDER
PRICES ONLY**

Prices, Specifications, Offerings, subject to change without notice.

Go Forth Into The World

Over the past few years, manufacturers have developed several single-chip microcontrollers. Microcontrollers consist of a microprocessor with on-board timers, input/output (I/O) lines, and RAM and ROM (or EPROM), with the ability to access off-chip memory and peripheral devices. Microcontrollers like this are increasingly popular in applications to control time-dependent devices or processes in real time.

Many microcontrollers (like the Intel 8048 or 8051) are known for their relatively limited instruction set. And since you have to program them in Assembly language, developing applications software is often tedious and awkward.

At some point, someone recognized the utility of a microcontroller with a limited, but usable, high-level language on-chip. Manufacturers began putting Tiny Basic in the few kilobytes of ROM space available on a microcontroller so that programmers could more easily use the chip for real-world control.

Rockwell International, a company dedicated to the 6500 family of processors and peripheral devices, decided to take this approach with one of their microcontrollers (the R65F11), but felt that there was a better alternative than Basic. Rockwell chose Forth, a stack-oriented language particularly useful in control applications. The Rockwell R65F11 microcontroller includes the kernel for their own RSC-Forth language in 3K of on-chip ROM. They also offer an 8K Forth development ROM, the R65FR1, which has everything necessary to develop Forth-based programs, including a disk operating system. When you think about it, 11K of language/operating system ROM is considerable.

This month's project, a Forth microcontroller board, will help you learn the Forth language to control devices in real-world applications.

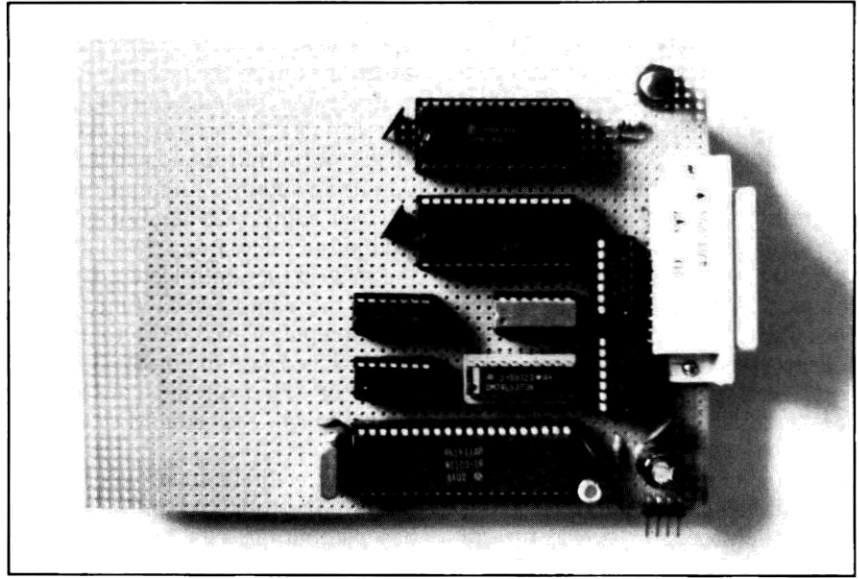


Photo. The Forth Microcontroller.

Although you can use it as a simple controller, you can also add on to the board to make it a Forth development system, complete with a disk drive and on-board EEROM (electrically erasable ROM) programming capability, with additional circuitry available from Rockwell (described later).

The R65F11 Microcontroller

A block diagram of the R65F11 microcontroller is shown in Fig. 1. The kernel consists of subroutines that execute the primary Forth commands. Programs written in either Forth or Assembly language can then access these commands. The R65F11 also provides 192 bytes of internal RAM, 32 bytes of which you can back up with batteries.

One of the best things about the R65F11 is its CPU, the 6502. The R65F11 uses an expanded 6502 instruction set, which is a great improvement over many other microcontrollers (like the 8748, which will appear in an upcoming column).

The R65F11 features 16 bidirectional, TTL- (transistor-to-transistor

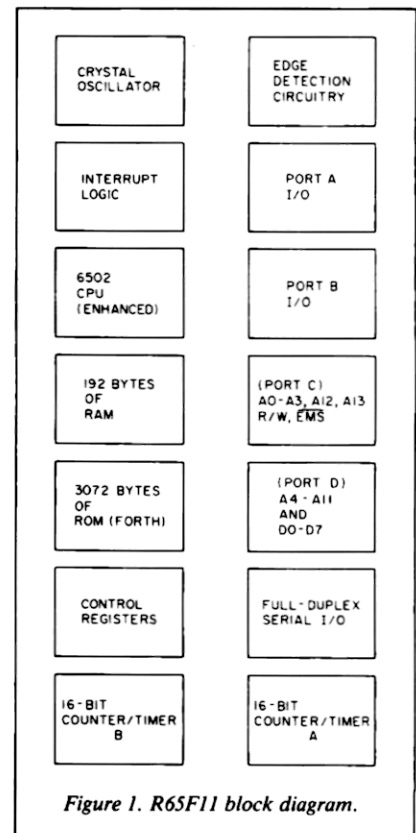


Figure 1. R65F11 block diagram.

logic) compatible I/O lines (comprising two 8-bit ports), two 16-bit timers, 10 interrupts (including internal ones), on-chip crystal oscillator (that requires an external crystal), full duplex serial port with internal baud rate selection, and +5V-only operation. All this comes in a single 40-pin DIP (dual in-line package). The R65F11 is also available in 1 MHz and 2 MHz versions.

While the R65F11 technically has four ports (ports A, B, C, and D), you can use only two of them with Forth. This is because ports C and D address external program and data memory, leaving ports A and B for user control applications. (A similar Forth microcontroller available from Rockwell, the R65F12, has three additional usable ports [for a total of five], and comes in a 64-pin QUIP [quad in-line package].)

Port B is a general-purpose I/O port. You can program individual lines as input or output, or you can program the entire port for latched input (an external strobe signal latches the 8-bit value into the processor, allowing the processor to read the correct value even if the input signals on the port B lines change). In the normal, unlatched mode, the processor reads the lines as they are at read time.

The method used to make bits inputs or outputs is somewhat different from that which parallel I/O devices (like the Intel 8255A described in previous projects) normally use. Each port line (A and B) has an internal pull-up resistor (using an FET—field effect transistor). They act as open collector drivers coupled with inputs, as shown in Fig. 2.

The internal port control latch asso-

ciated with each port, which actually outputs to the open-collector drivers, determines which lines act as inputs, and which as outputs. If you use a line as an input, you have to make sure the processor sets the corresponding bit (i.e., brings it high) in the port control latch, allowing the input bit to control the state of the line. A conflict occurs when an external device tries to drive the line to a logical high state, while the corresponding port latch bit output is low. Damage could occur to either or both of the devices.

If you use a line as an output, you can set and clear the corresponding bit in the port control latch to turn the output on and off. An input from the reserved address for a given port will read in the value of the port lines, not the value in the control latch. If a bit is set in the control latch (making the line an input) while an external device drives the corresponding line low, the processor will read the line as low, even though the control latch bit is high.

You may think there would be a problem in turning on and off certain bits without affecting others in the same latch, but you can get around this problem. The most obvious way is to keep a mirror image of the value in each port control latch in reserved memory locations. You should update these values whenever the controller writes to the respective ports. To alter a single bit, the CPU reads the current value from the mirror location and changes the desired bit. The CPU rewrites the resulting value to the mirror location, as well as to the respective port latch.

The R65F11, however, provides Assembly-language instructions to make

this task easier. These read-modify-write instructions read the specified port control latch, modify the specified bit, and write the modified byte back to the port control latch. This is all done in a single operation, making these instructions efficient in terms of both time and memory space.

Port A is more versatile than port B, and you can use it in several ways. The internal serial port, mentioned earlier, uses bits 6 and 7 of port A. You can use these bits as general-purpose I/O lines or as the serial communication transmit and receive lines. PA5 (bit 5 of port A) doubles as an input or output signal used with counter/timer B, while you can use PA4 as an input or output signal with counter/timer A. You can also use PA4 as the receive clock input or the transmit clock output for the serial port. PA0 doubles as the latch strobe input for port B, when port B is in its latched-input mode. Use PA1-PA3 as general-purpose I/O lines only.

Port C (in the original R6511) generates several output signals necessary for external memory accesses: A0, A1, A2, A3, A12, A13 (address lines), R/W (read/write), and EMS/ (external memory select). Likewise, the R65F11 uses the original port D to generate other necessary memory access signals, but these eight lines are double-functioned (multiplexed). During the first portion of an external memory access cycle, they contain the A4-A11 address line values, latched in an external latch on the falling edge of EMS/ mentioned above. During the last portion of the external memory access cycle, these lines function as data lines, being inputs or outputs, depending upon whether the current cycle is a read or write.

R65F11 Mode Control Register

The R65F11's mode control register (MCR) appears in Fig. 3. This is the primary control register, responsible for configuring several microcontroller options. Bits 5, 6 and 7 configure the bus mode, and you must set them all (with a value of 1) for the R65F11. Bit 4 indicates whether port B is in the latched-input mode (bit set) or general-purpose I/O mode (bit clear). Bits 2 and 3 select the operating mode for counter/timer B, while bits zero and 1 select the operating mode for counter/timer A. Each counter/timer

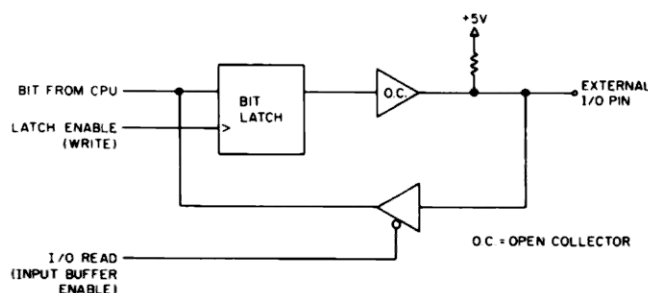


Figure 2. Functional diagram of general purpose I/O line.

TAX-PREP™ '85

Easy, 1984 tax templates for MULTIPLAN™ or LOTUS 1-2-3™ users

"The best I've seen, excellent support, good instructions, very easy to get used to." Professional Tax Preparer, NJ.

SAVE TIME - SAVE MONEY USE YOUR MULTIPLAN or LOTUS 1-2-3 SPREADSHEET

Professional, fully documented, linked templates for preparing 1984 personal income tax returns. Enter data once. User friendly, complete manual & tutorial. All tax tables and computations built in, also use for "what if" tax planning. IRS accepted printout.

Includes all of the following forms and schedules:

1040, A, B, C, D, E, F, G, R, SE, W, 2106, 2119, 2210, 2441, 3468, 3903, 4562, 4684, 4797, 5695, 6251.

TO ORDER: specify TRS-80 Models 4, 4p, II, 12, or 16 (TRSDOS), 8" CP/M or Tandy 2000. IBM PC, Apple II and Macintosh also available. MULTIPLAN or 1-2-3 REQUIRED (specify which).

**TAX-PREP '85 - \$129.95 plus \$3.00 shipping
(PA add 6% tax).** Call or write for more information.

WARE 178



17 BRYN MAWR AVE. S8, Bala Cynwyd, Pa 19004 (215) 667-4064

Electronic Mail.... On A Micro!

As well as Public, Private or Pay BBS.

Our system offers features such as:

- Multi levels of access to a user.
- High security of system and your files.
- Unattended message transfer to compatible system.
- Fully maintainable from a remote location.
- User configurable to include or exclude most features, allowing you to personalize your system.
- Number of users & messages configurable from 1 to 900, allowing those with large storage to use it.
- Configurable to handle different terminals.
- Supports Hayes type of modem.
- and much much more.

**ORDER NOW - SAVE \$10.00
when you mention this AD.**

IBM & Compatibles \$249.95
TRS-80 \$199.95
Mail Label Module \$59.95
Terminal for IBM \$79.95

TVG Systems P.O. BOX 94433
(604) 946-7910 Richmond, B.C. V6Y 2A8

Try Our BBS - Call our Data Line - 604-946-0955

MULTI-BASIC

The Compatible BASIC Compiler from Alcor

(Supported Features Chart)

	MBASIC	CBASIC Compiler	CBASIC	Multi-Basic
IF ELSE/FOR NEXT	•	•	•	•
WHILE WEND	•	•	•	•
OPEN/CLOSE	•	•	•	•
CREATE/DELETE	•	•	•	•
PRINT/PRINT USING	•	•	•	•
LPRINT/LPRINT USING	•	•	•	•
PRINT @	•	•	•	•
INPUT/LINE INPUT	•	•	•	•
INPUT #/LINE INPUT #	•	•	•	•
READ #/READ # LINE	•	•	•	•
LOC/LOF/EOF/ERROR	•	•	•	•
FIELD/GET/PUT	•	•	•	•
RSET/LSET/ERASE	•	•	•	•
MKDS/MKIS/MKSS	•	•	•	•
CVI/CVS/CVD/SPC	•	•	•	•
READ/DATA/RESTORE	•	•	•	•
TRON/TROFF	•	•	•	•
DEF FN/RANDOM/RND	•	•	•	•
DEF USR/SWAP/WAIT	•	•	•	•
CALL (ASSEMBLY LANG)	•	•	•	•
DEFSTR/DBL/SNG/INT	•	•	•	•
DOUBLE/REAL	•	•	•	•
INTEGER/STRING	•	•	•	•
GOTO/GOSUB	•	•	•	•
ON ERROR GOTO	•	•	•	•
RESUME/RESUME NEXT	•	•	•	•
ERL/ERR	•	•	•	•
ON number GOTO/GOSUB	•	•	•	•
NAME/RENAME	•	•	•	•
PEEK/POKE/INP/OUT	•	•	•	•
SYSTEM/SOUND	•	•	•	•
SADD/MATCH/UCASE\$	•	•	•	•
VAL/TAB/STR\$/VARPTR	•	•	•	•
SIN/COS/TAN/ATN	•	•	•	•
LOG/EXP/ABS/SQR	•	•	•	•
COMMAND\$/IF END	•	•	•	•
INKEY\$/INPUT\$	•	•	•	•
TIMES/DATES/HEXS/OCTS	•	•	•	•
STRINGS\$/SPACES	•	•	•	•
LEFT\$/RIGHT\$/MID\$	•	•	•	•
CHR\$/ASC\$/LEN\$/SGN	•	•	•	•
OPTION BASE	•	•	•	•
ROW\$/POS\$/LPOS	•	•	•	•
DIM\$/MEM\$/FRE	•	•	•	•
MOD\$/MFRE	•	•	•	•
GET/PUT (CHARACTER)	•	•	•	•
KILL/CLS/CLEAR/INSTR	•	•	•	•
INT/FIX/CINT	•	•	•	•
CSNG/CDBL	•	•	•	•
CHAIN	•	•	•	•
CONSTAT\$/CONCHAR%	•	•	•	•
CONSOLE/LPRINTER	•	•	•	•
BINARY RANDOM FILES	•	•	•	•
ASCII RANDOM FILES	•	•	•	•
255 CHARACTER NAMES	•	•	•	•
REDIMENSIONED ARRAYS	•	•	•	•
UNLIMITED STRING SIZE	•	•	•	•
MULTI-LINE FUNCTIONS	•	•	•	•
PROCEDURES/RECURSION	•	•	•	•
FUNCTION TRACING	•	•	•	•
LOCAL VARIABLES	•	•	•	•
NESTED FUNCTIONS	•	•	•	•
OPTIONAL LINE NUMBERS	•	•	•	•
DESCRIPTIVE LABELS	•	•	•	•
SINGLE PRECISION	•	•	•	•
DOUBLE PRECISION	•	•	•	•
LINK TO PASCAL & C	•	•	•	•

For TRS80 models I, II, III, 4, 12, or 2000 using TRSDOS, CP/M, or MSDOS and for IBM PC using PCDOS

Multi-Basic, Pascal, or C \$139

Add shipping \$6.00 USA, \$28 Overseas

ALCOR Systems

13534 Preston Road, Suite 365
Dallas, Texas 75240
(214) 238-8554

Multi-Basic is a trademark of Alcor Systems
TRSDOS, TRS80 is a registered trademark of Tandy Corporation
CP/M, CBASIC are trademarks of Digital Research
MSDOS, MBASIC are trademarks of Microsoft

has four possible operating modes: interval timer, asymmetric pulse generator, event counter, and retriggerable interval timer. This isn't quite the selection offered by the 8253/8254 programmable interval timers described in a previous column, but it's pretty good for a microcontroller.

R65F11 Serial Communication Channel

The serial communication control register (SCCR) is shown in Fig. 4. It provides separate enable bits for the transmitter and receiver, and each has two modes of operation. Bit 7 is the

enable bit for the transmitter; when set, the transmitter is enabled (PA6 is used as the transmitter output), and when clear, the transmitter is disabled (PA6 is used as a general-purpose I/O line). Similarly, bit 6 of the SCCR controls the enable status of the serial receiver, which uses PA7 when enabled.

The transmitter and receiver lines operate in two modes: asynchronous (ASYN) and shift/register (S/R). In the ASYN mode, the line acts as a normal asynchronous serial input or output line, including the addition of start, stop and (optionally) parity bits when transmitting, and looks for these

when receiving. In the S/R mode, the transmitter and receiver act as shift registers, shifting bits in or out at a predetermined rate, but doesn't add or check for start, stop, or parity bits.

When in the ASYN mode, the transmitter uses counter/timer A to generate the baud rate. The frequency generated by counter/timer A must be 16 times the desired baud rate frequency. In the S/R mode, the bits are also shifted out at $\frac{1}{16}$ of the counter/timer A frequency, which is available on the PA4 line. When the receiver is in the S/R mode, the shift clock for the shift into the receiver register is the PA4 line. The transmitter and receiver cannot simultaneously be in the S/R mode. Bits 4 and 5 of the SCCR determine the mode configuration for the transmitter and receiver. As shown, the register does not allow both to be in the S/R mode at the same time.

Whenever the serial I/O section is enabled in a manner requiring an internal clock, counter/timer A is forced into the Interval Timer mode.

Bits 2 and 3 of the SCCR determine the number of bits per character the R65F11 sends and receives. Bit 1 indicates whether or not parity is enabled (bit 1 set equals parity enabled), and bit zero determines the parity, odd (where bit zero equals zero) or even (bit zero equals 1).

The R65F11 also has a serial communication status register (SCSR), shown in Fig. 5. It indicates the normal serial status conditions, such as communication errors, transmitter buffer empty, and receiver buffer full.

For a more in-depth discussion of serial communication, see the January 1984 Project 80 (p. 197).

A Look at Stacks

As mentioned earlier, Forth is a stack-oriented language. A stack represents a last in/first out (LIFO) data structure. The last item put onto the stack is the first item taken off. The end of the stack where items (or data) are put is called the top of the stack. Putting an item on top of the stack is called pushing onto the stack; removing an item from the top of the stack is called popping off the stack.

A stack is usually a block of reserved memory. The stack pointer keeps track of the top of the stack. An illustration of a stack in memory is shown in Fig. 6. Since the memory al-

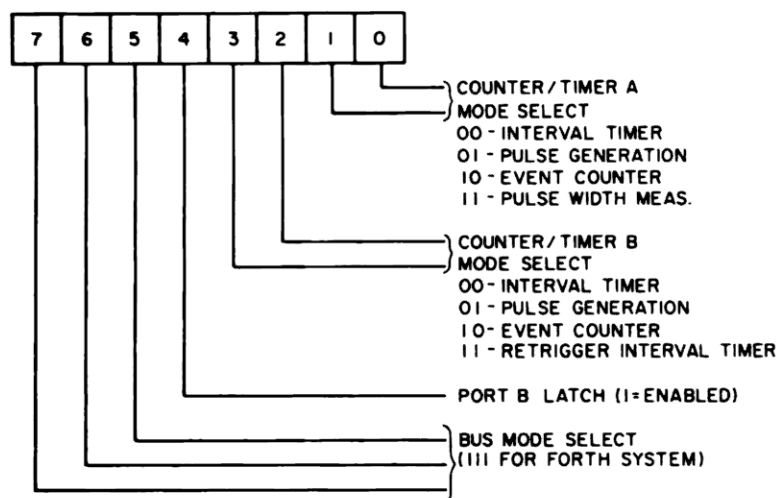


Figure 3. R65F11 mode control register (MCR).

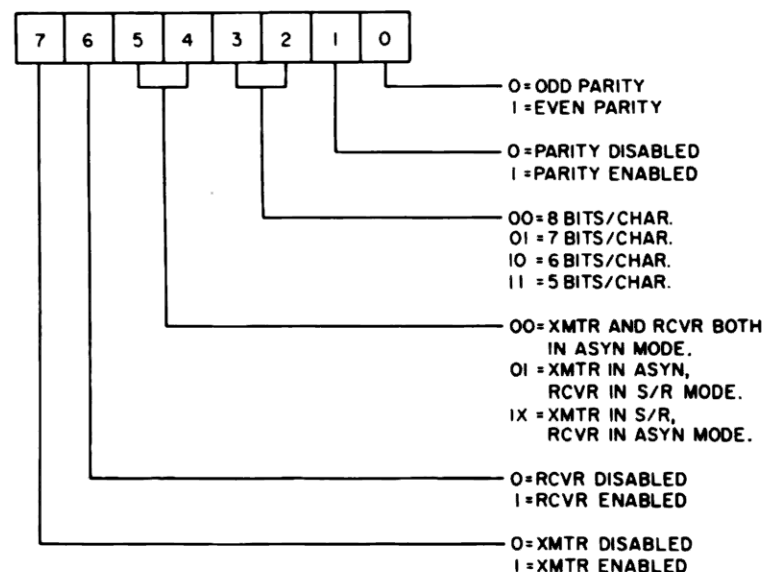


Figure 4. R65F11 serial communication control register (SCCR).

DISKETTES
 **FREE SHIPPING** 
 ON ORDERS OF \$40.00 OR MORE
1-800-334-DISK
 (617) 839-4404 MASS. RES.

DISK TYPE PRICES PER EACH 10 PER BOX	3M	maxell	wabash HIGH QUALITY LOW PRICE
5 1/4" Sing. Side Dbl. Den.	#740 \$2.19 EA.	#MD1 \$2.29 EA.	#MI3A \$1.59 EA.
5 1/4" Dbl. Side Dbl. Den.	#745 \$2.65 EA.	#MD2 \$2.79 EA.	#MI4A \$2.15 EA.
5 1/4" Reversible Dbl. Den.	OMNI \$2.45 EA.	#5321 \$2.45 EA.	Sing. Side Sing. Den. \$1.39 EA.
AMARAY • DISK FILE • MEDIA MATE 50 \$15.95			#MIIA \$1.39 EA.

PRINTER PAPER • 540 Sheets • KEEN-EDGE • \$9.95

6 Outlet Surge Suppressor • \$24.00 EA. HEAD CLEANING KITS \$10.95 EA.

QUANTITY	STOCK #/DESCRIPTION	PRICE	S & H / TAX	TOTAL
----------	---------------------	-------	-------------	-------

☐ VISA ☐ Mastercard ☐ MONEY ORDER ☐ CHECK ENCLOSED ☐ C.O.D. (Add \$1.85)
☐ SEND FREE BROCHURES

Card No. _____ Exp. Date _____

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

Add \$2.00 Shipping & Handling on orders less than \$40.00. Mass. Residents add 5% tax.

MAGNETICS, INC.
 153 MAIN STREET / P.O. BOX 98
 SOUTH GRAFTON, MA 01560

School & Municipal P.O.'s welcome!
 Free shipping applies to prepaid and credit card orders only
 Hours: 9 am - 7 pm Mon. - Fri., Eastern Standard Time - Sat. 9 am - 3 pm

TRS-80 COMPUTERS

MODEL IV 64K	\$959.00	MODEL 2000 w/HD	\$2160.00
2 DISKS RS 232		COLOR COMPUTER	3360.00
MODEL IV P	850.00	64K	170.00
MODEL 1000	979.00	MODEL 100 8K	350.00
		MODEL 100 24K	500.00

Tandy 1200 HD IBM compatible \$22.50
 Terminal OT100 \$699

DISK DRIVES

15 MEG HD	\$2099.00
COLOR DISK 0	275.00
COLOR DISK 1	229.00

PRINTERS

OKIDATA 92	\$379.00
GEMINI 10X	270.00
GEMINI 15X	380.00

DMP-110	\$ 299.00	DMP-120	\$ 379.00
DMP-105	159.00	DMP-430	699.00
DMP-500	1064.00	DMP-2100	1598.00
DMP-420	680.00	DWP-210	459.00
DWP-510	1149.00	CMP-2150	3135.00

Langley St. Clair Green and Amber Screen \$89.00

BODEX CORP.
 224 E. MAIN ST.
 MARLBORO, MASS. 01752
 Phone (617) 485-5115 or 481-1029
 TRS-80 Trademark of Tandy Corp.

YOU'COULD BE USING LAZY WRITER - NOW ONLY \$124.95 !

"...the most comprehensive system I have seen to date for the TRS-80 Model I, III, and 4. If you have ever used a professional word processing system that costs at least \$15,000, like a Wang, you are familiar with its powerful features. Now you can have these same features for your TRS-80..."

Baron's Microcomputing Reports

"I would give Lazy Writer my highest recommendation..."
 Stew Schneider in On-Line Today



- works with any printer
- easy to learn - used in many schools
- fast, easy-to-remember editing commands
- Mod 4 version has 80 character screen
- powerful features for advanced users
- good support - free user newsletter

LAZY WRITER FOR MODEL I, III, OR 4 \$124.95

THIS IS LAZYFONT

LazyFont creates and prints fonts with an Epson or Prowriter printer. Lazy Writer version comes with 15 free fonts and many more available. BASIC version (for use by itself) comes with 8 free fonts. Create your own too!

LAZYFONT FOR MODEL I, III, OR 4 \$49.95
 ELECTRONIC SYMBOL FONT \$49.95
 comes with 41 standard schematics, ready to print

NEW LOW PRICE ON MULTIDOS 1.6 - ONLY \$59.95

"...every DOS I've tried has either been too slow and weak or too complicated and powerful for me to use. I feel sure that many other people have this same problem, and MULTIDOS is certainly the solution."
 Tim Knight in InfoWorld

- If you have many disk formats, MULTIDOS is for you: it reads Mod I&III LDOS, Mod I TRSDOS, Mod I&III NEWDOS 80, Mod I&III DOSPLUS, TRSDOS 6 and DOSPLUS 4; writes to Mod I&III LDOS, Mod I TRSDOS, Mod I&III NEWDOS 80, Mod I&III DOSPLUS, TRSDOS 6 and DOSPLUS 4. Utility programs let you read Model III TRSDOS disks and convert the address marks on Mod I TRSDOS disks
- VFU utility lets you COPY, PURGE, or MOVE files by displaying a directory and letting you mark files with the cursor; even copies and moves FROM DATA DISK TO DATA DISK with two drives and from one DOS to another!
- use multiple commands on one line
- fastest BACKUP and COPY; use with one or two drives
- auto density and track recognition; no more PDRIVE hassle
- on-screen HELP with 40 different library commands
- alphabetized directory

MULTIDOS' SUPER BASIC ADDS MANY ENHANCEMENTS

- leaves over 40K of memory free
- combine program lines, delete spaces with packer
- incorporates BOSS debugging utility
- intelligent global editor
- many more features
- your program displays by page; no more "warp 5" scrolling

MULTIDOS 1.6 FOR MODEL I OR III IS ONLY \$59.95.

ZEUS - NEW EDITOR/ASSEMBLER FOR THE SERIOUS PROGRAMMER

"All my code has been converted to Zeus. This is the best full feature productivity tool I've seen for serious Z80 programmers."

David Welsh, author of Lazy Writer

- supports undocumented Z80 op codes and standard pseudo ops
- really FAST assembly
- intelligent error display - shows line number and file containing error, even when you don't print to screen
- easy line editor won't let you enter incorrect syntax
- remembers file name of source and object code; eliminates accidental overwrite
- dynamic renumber; no more "no room between lines"
- calculator mode gives answers in decimal, hex, and binary
- GET command gets files from disk with lightening speed; handles big files so fast you'll think they're small
- doesn't hog memory - lots of room for source code
- easy block move & duplication
- "pages" the screen backward & forward for easy editing
- reads and writes files in ASCII, EDTASM, and Zeus compressed format
- Model 4 version supports 80x24 lines

ZEUS for Model I, III, 4, or MAX-80 \$79.95

AlphaBit Communications, Inc.

13349 Michigan Ave.
 Dearborn, Michigan 48126

Call (313) 581-2896

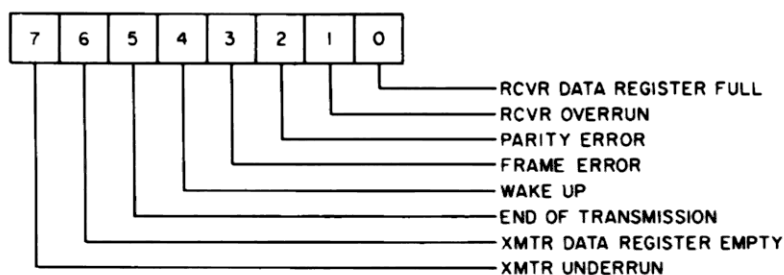


Figure 5. R65F11 serial communication status register (SCSR).

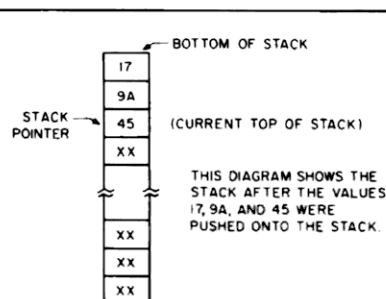


Figure 6. Illustration of a stack in memory.

located to the stack is limited, you need to define upper and lower limits. If you try to push more values onto the stack than allowed by memory, you'll get a stack overflow error. Similarly, if you try to pop off more items from the stack than you pushed onto the stack, you'll get a stack underflow error. When you use stacks in programs or languages, the software needs to check for overflow and underflow conditions.

Since stacks typically grow towards lower memory addresses, the CPU decrements the stack pointer whenever you push a new data value onto the stack. You can implement a stack pointer in two ways. With the first, the stack pointer always points to the last item put on the stack. When you push a new item onto the stack, the CPU first decrements the pointer, then loads your data on the stack at the new pointer location. If you want to pop data off the stack, the CPU pulls the data from the location the stack pointer points to and increments the pointer to indicate the new top-of-stack value.

The second approach is similar, but the stack pointer always points to the next location for a value. To push data on the stack, the CPU puts the data in memory at the location the stack

pointer indicates; then it decrements the stack pointer. To pop a value off the stack, the CPU first increments the pointer, then pulls the value from the location to which the stack pointer points.

It really doesn't matter which of these methods you use in a particular system. It is important, however, that the system remain consistent. Pick an approach and stick with it. The most common approach, it seems, is the first one described above.

The RSC-Forth Language

Forth was originally developed for real-time control applications and is ideal for machine and process control, data acquisition, and automatic testing. Forth is designed to work easily with Assembly language for increased speed (where necessary), while at the same time providing a high-level language environment for greater programming efficiency and reliability.

The Rockwell RSC-Forth user's manual describes Forth this way: "Forth can be called a computer language, an operating system, an interactive compiler, a data structure, or an interpreter, depending upon your point of view. It was designed to combine the strengths of both compilers and interpreters. The result is a unique language based on pre-defined operations that minimizes software development time and costs, supports structured programming and program modularity, compiles interactively to ease debugging and to reduce programming errors, compacts into small object code and executes extremely fast. Additional words may be defined to allow usage by non-programmers."

While I haven't worked with Forth enough to verify all those statements, I have found it to be quite a good language for control applications.

Rockwell's RSC-Forth is modeled after fig-Forth, and implements nearly all fig-Forth functions (that's a tongue twister). There are also additional functions, mostly specific to the R65F11 microcontroller or its operating system (in the R65FR1 ROM), not found in the fig-Forth model. The development ROM even contains a special one-pass assembler for combining Assembly language with Forth programs.

The RSC-Forth user's manual (see the list of references) is an excellent resource for this system, describing the operation of all of the RSC-Forth functions, as well as interacting with mass storage, combining Forth and Assembly language programs, and putting programs in ROM. A coupon for a free copy of the book is included with the purchase of the R65FR1 development ROM. The book also includes a rather lengthy reference list of books on Forth.

Construction of the Forth Microcontroller

The finished Forth microcontroller is shown in Photo 1. The schematic for the Forth microcontroller is in Fig. 7, while the parts list is in Table 1. Table 2 shows the power and ground connections for the smaller ICs. You may notice that the schematic shows only eight ICs while the photo shows nine. I just did a little experimenting with my board.

Building the board is simple and straightforward. Most of the RAM and ROM lines are wired in parallel, since they're both JEDEC (standard) 8K by 8-bit devices. You will need one 40-pin socket, two 28-pin sockets, one 20-pin socket, one 16-pin socket, and three 14-pin sockets.

You may also notice the -12V supply coming into the board. This is required for the RS-232C interface. If you do not have this or a similar minus voltage available (between -5V and -18V), you may want to include the optional circuit shown in Fig. 8. This circuit, also used in the November 1984 modem project (p. 146), generates a -5V supply from the incoming +5V supply. You can then use the generated -5V to supply the minus voltage needed for the RS-232C interface (pin 1 of the 1488).

I used a female DB-25S connector as the RS-232C connector. You need

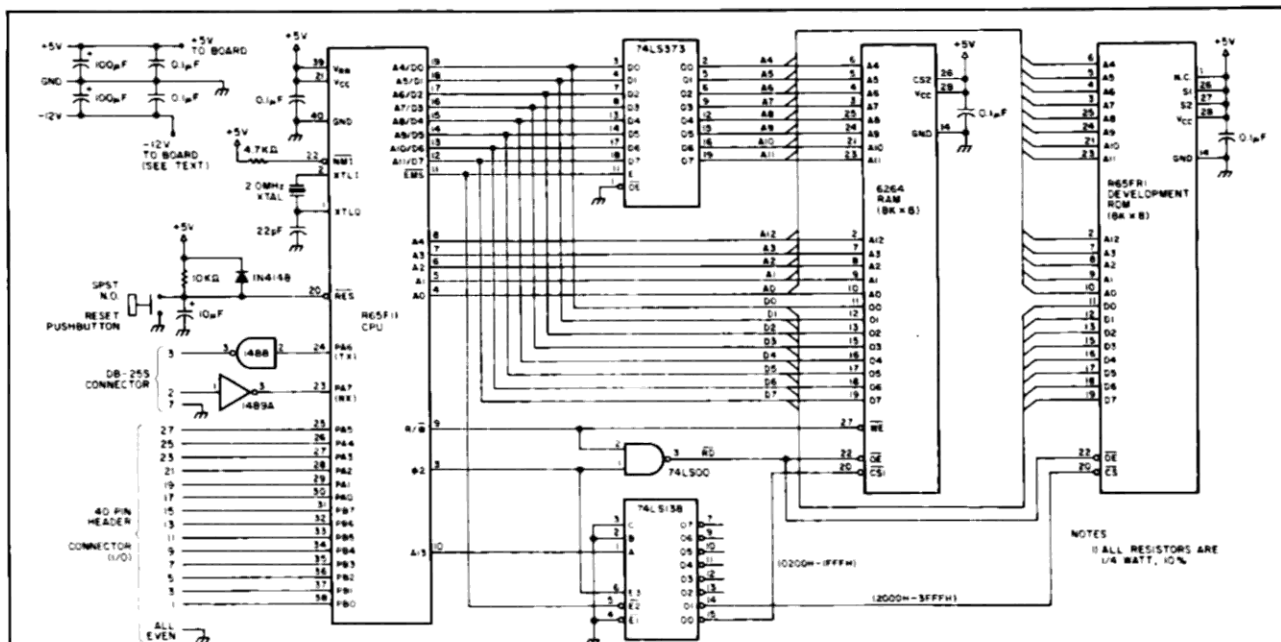


Figure 7. Forth-based microcontroller board.

only three wires: 2 (receive), 3 (transmit), and 7 (signal ground). I chose to wire the connector as a DCE (data communication equipment) device, with pins 2 and 3 swapped from the normal DTE (data terminal equipment) configuration. This lets you connect to your computer (used as a terminal) or another terminal using a "straight through" cable (a cable connecting pins 2-to-2, 3-to-3 and 7-to-7). This works since most terminals and computers are wired as DTE devices. If you have problems, try swapping pins 2 and 3.

Although not on my board, I specified a 40-pin expansion connector

(header connector) to connect the R65F11 I/O lines. You should use this if you want to control an external device with the microcontroller. I grounded all even-numbered lines for shielding purposes.

I have heard of some confusion over header numbering. Headers always have pin 1 marked (generally with an arrow). All even-numbered pins are on that side of the connector. The pin opposite pin 1 is pin 2, and all even-numbered pins are on the same side as pin 2.

You will also need a power supply capable of +5V at 500mA and (optionally) -12V at 30mA. The R65F11

can dissipate up to 1 watt of power, which is considerable for a chip of its size.

Operating the Forth Microcontroller

Figure 9 shows the external memory access timing for the R65F11 microcontroller. The phase-2 clock signal the microcontroller generates is the basic timing signal. It runs at one-half the crystal frequency (1 MHz in this system). During the first part of the cycle (when phase 2 is low), the R65F11 validates address lines (A0-A13), as it does the R/W signal (high for a read cycle, low for a write cycle). After these lines stabilize, the EMS/ line falls, making the 74LS373 latch the A4-A11 address lines. When phase 2 then goes high, the R65F11 enables the external memory. The RD/ (read) strobe also goes active (low) at this time, if the R65F11 is in a read cycle. When phase 2 returns low, the R65F11 completes the cycle to start the next memory cycle.

Note that EMS/ only goes active during external memory accesses. Internal memory accesses don't cause EMS/ to go active, so the internal addressing space (particularly for the RAM) does not need to be decoded out of the addressing space of the external memory. Internal RAM and device addressing space is from 0000-00FF hexadecimal (hex). You can't access these 256 bytes of addressing

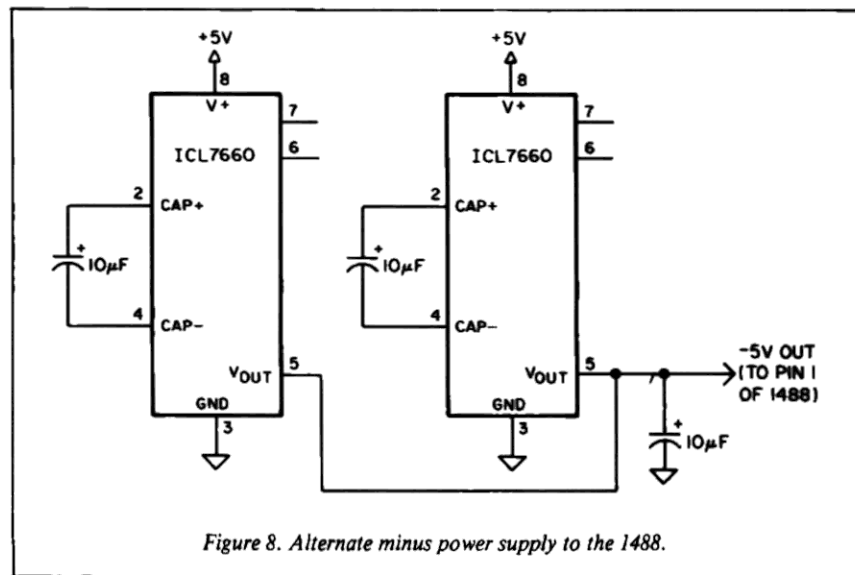
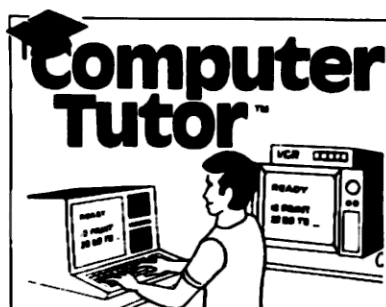


Figure 8. Alternate minus power supply to the 1488.



VIDEO INSTRUCTION TAPES! STEP BY STEP INSTRUCTIONS

USE YOUR VCR SIDE BY SIDE WITH YOUR COMPUTER TO LEARN HOW TO PROGRAM, AND HOW TO USE PROGRAMS. YOUR VCR ALONG WITH YOUR COMPUTER SERVE AS YOUR PERSONAL TUTOR. PAUSE YOUR VCR TO REVIEW AND LEARN AT YOUR OWN PACE.

CAT# TOPIC APPROX. PRICE TAPES FOR THE TRS80 MODEL 1, 3, 4.

DOS-1	TRSDOS 1.3	90 MIN	\$39.95
DOS-6	TRSDOS 6.0	105 MIN	\$39.95
DOS-3	NEWOS 80	105 MIN	\$39.95
DOS-2	DOSPLUS 3.5	105 MIN	\$39.95
DOS-5	LDOS	105 MIN	\$39.95
DOS-7	CPM 2.2	105 MIN	\$39.95
	MONTEZUMA		
DOS-4	MULTIDOS	105 MIN	\$39.95
EW-1	VISCALC	90 MIN	\$39.95
EW-7	MULTIPLAN	90 MIN	\$39.95
WP-1	LAZY WRITER	105 MIN	\$39.95
WP-2	SUPERSCRIPT	105 MIN	\$39.95
WP-3	SCRIPTSIT	90 MIN	\$39.95
WP-4	NEWSSCRIPT	105 MIN	\$39.95
DB-1	PROFILE IN PLUS	105 MIN	\$39.95
DB-2	PFS FILE	90 MIN	\$39.95
DIO-3	TRSDOS 1.3	105 MIN	\$39.95
	DISK I/O		
DIO-4	TRSDOS 6.0	105 MIN	\$39.95
	DISK I/O		
BP-1	LEARNING MOD 180	MIN	\$49.95
	3.4 BASIC		
BP-2	LEARNING MOD 180	MIN	\$49.95
	ONE BASIC		
TC-1	MTERM	45 MIN	\$29.95
UT-1	DOTWRITER	75 MIN	\$29.95

VHS or BETA FORMAT

Add \$3.00 per order for
shipping and handling.
Add \$3.00 for C.O.D.



TO ORDER PHONE or WRITE
LYNN COMPUTER SERVICE

6831 West 157th Street
Tinley Park, Illinois 60477
(312) 429-1915

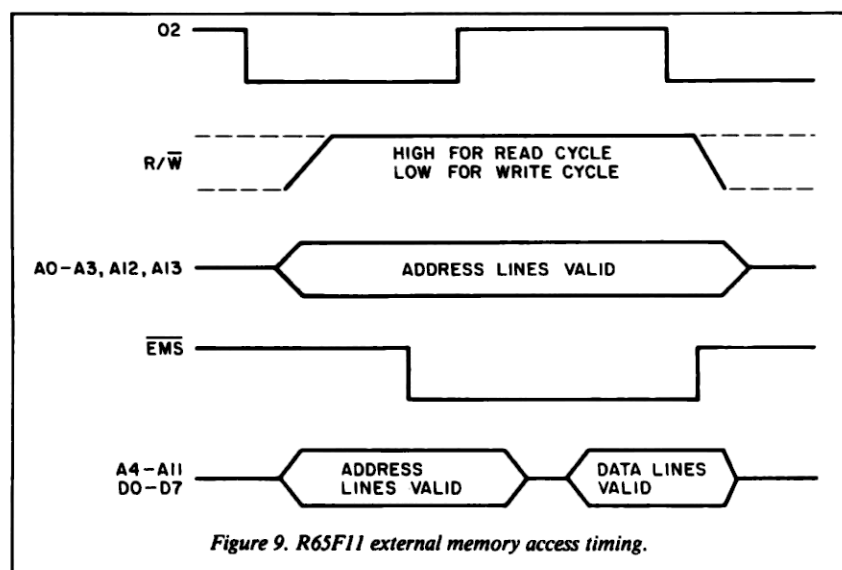


Figure 9. R65F11 external memory access timing.

in the external 6264 RAM chip. The loss of 256 bytes is not, however, significant when you have 8K bytes available.

When you power up or reset the board, the R65F11 executes a system startup function called Cold. This function initializes the various R65F11 registers to allow external memory access and sets up the serial channel for 1,200 baud (assuming a 1 MHz clock) asynchronous operation, with 7 data bits and parity disabled. The R65F11 then makes a test of the variable ("CLD/WRM") at location 030E hex. If it contains the value A55A, the R65F11 assumes a warm start; otherwise, it assumes a cold start. You can also initiate a cold start from your terminal using the Forth Cold command.

Whether a warm or a cold start occurs, the R65F11 checks system memory at every 1K byte boundary starting at 0400 hex. The R65F11 checks the first 2 bytes at each boundary for an A55A pattern. If the R65F11 finds such a pattern, it assumes an autostart ROM (like the R65FR1 development ROM or a custom user ROM), and the subsequent information indicates where execution should start. If it finds no auto ROM, the operating system sends the message "No ROM" to the terminal through the RS-232C channel, then attempts to boot a program from disk. The R65F11 assumes that a WD1793-type disk controller is installed.

In the case of your board, the R65F11 will find the development ROM, and an RSC-Forth prompt

message should appear on the terminal screen. At this point, you're in business. You can define special function words, execute immediate functions, or develop entire programs.

Many of the Forth command words work on values on the stack. You put a value on the stack by typing in the data (16-bit integers only), separated by spaces or carriage returns. Arithmetic operations are in the postfix or reverse Polish notation (RPN), popularized by Hewlett-Packard calculators. To perform a calculation such as $(12 + 3) * (24 + 5)$, you enter $12\ 3\ +\ 24\ 5\ +\ *$.

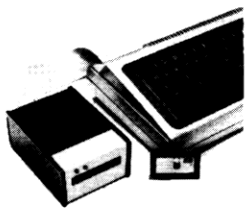
Entering the 12 and 3 (followed by spaces) puts the two numbers on the stack. Typing in a plus sign adds the two stack values and puts the results on the stack. The R65F11 then puts the numbers 24 and 5 on the stack (remember the previous sum is still on the stack). The next plus sign adds the 24 and 5, then the multiplication sign multiplies the two sums, with the result put on the stack. To display the value that is on the top of the stack (and pop it off), you type in a period.

A very short program function, named PORT-B-INC is shown in Fig. 10. The initial colon indicates that

```
: PORT-B-INC 1
  BEGIN
    DUP PB C!
    1 + 0
  UNTIL ;
```

Figure 10. Example Forth program.

AFFORDABLE MASS STORAGE



A&J MICRO DRIVE

1050 E. Duane Ave., Suite 1
Sunnyvale, CA 94086
(408) 732-9292

Model I ESF STARTER KIT \$149.50

Add \$6.50 Shipping, Includes: Drive 0,
Manual, Operating System, Power
Supply, Cable, Data I/O Tape,
5 Microwafers

Model I ESF DRIVE 1 thru 7 \$99.50

Add \$6.50 Shipping

Model I OWNER'S MANUAL \$4.95

Upper/Lower Case Kit \$14.95
Character Generator \$19.95

7200 Baud Transfer Rate
No Volume Controls or Rewind
No Expansion I/F Required
Automatic Verify with Save
Uses only 4 Bytes User Memory
Key Debounce Routine in ESF

MICRO WAFER

5 ft.	\$3.50
10 ft.	\$3.50
20 ft.	\$4.00
35 ft.	\$4.00
50 ft.	\$4.50

MODEL I BUS-EXTENDERS

2 for 1	\$25.00
3 for 1	\$30.00
4 for 1	\$35.00
5 for 1	\$40.00
Custom	call for prices

ALSO COMPATIBLE WITH...

Timex 2088	\$199.50 complete
Timex 1000	\$169.50 complete
Timex 1500	\$169.50 complete
Commodore 64	\$84.95 complete
VIC-20	\$84.95 complete

Software Available

Check or Money Order Enclosed C.O.D. add \$1.65
U.P.S. shipping cost, add \$3.00, unless other specified
CA residents add 6.5% sales tax Charge to my ☐ VISA ☐ MASTERCARD

Prices subject to change without notice

✓ 166

E-C

KITS FROM E-C DATA !

COMBINE THE COMPONENTS TO DESIGN THE
SYSTEM OF YOUR CHOICE, EASILY AND
ECONOMICALLY.

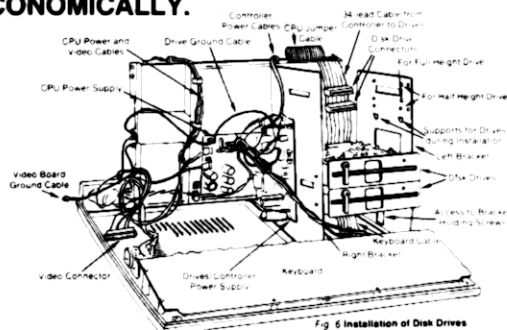


Fig. 6 Installation of Disk Drives

Illustration from E-C DATA's Disk Kit Installation Manual

E.g., take the \$695 Two Double-Sided 80-Track Drives Kit (over 720 kBytes per drive). It consists of our state-of-the-art WD-2793 based Disk Controller, two Double-Sided 80-Track Slim-Line Epson Drives, Switch-Mode Power Supply - mounted on brackets ready to install, Free E-C System Test Diskette, DOS, Installation Manual and Technical Reference Manual including Circuit Schematics - **Outstanding value for your money. Remember, our prices include shipping and a 12 month warranty !**

FREE SHIPPING WORLD WIDE !

12 MONTHS GUARANTEE !

FOR MODEL 3 AND 4:

Complete 2-Drive Kit (80 Tr., DS, 720k, Slim-Line)	695
Complete 2-Drive Kit (40 Tr., DS, 360k, Slim-Line)	635
Complete Disk Kit w/64k M4 RAM w/o Drives†	265
Complete Disk Kit w/ 32k M3 RAM w/o Drives†	250
Complete Disk Kit w/o Drives†	215
Floppy Disk Controller (3 1/2, 5 1/4, 8") for M3/4	155
Real-Time Clock/Calendar Option, ADD	60
8" Drive Option, ADD	10
Disk Installation Hardware w/Power Supply, w/o Controller	95
2 to 4 Internal Drive Expansion Power Supply	65
RS-232 (V.24) Communications Interface Kit, M3/4	75
First 64k M4 RAM Expansion Kit	62
64k - 128k M4 RAM Expansion Kit w/PAL U72	70
M4 PAL U72 alone	30
TRSDOS 6.1 for M4†	45
Disk Drive Shugart SA-455, Slim-Line, DS, 40 Tracks	205
Disk Drive Shugart SA-465, Slim-Line, DS, 80 Tracks	240

FOR MODEL 100:

8k Internal RAM Expansion, Low-Power CMOS	59
32k Battery Backed Plug-In Extra RAM Bank (32-64k)	325
Bell 103 to CCITT Internal Modem Conversion Kit	65

† Specify if you intend to use Kit with Full or Half Height Drives.
‡ Only with Purchase of Disk Kit. Specify 40 or 80 Track Diskette.
TRSDOS and TRSDOS are Trade Marks of Tandy Corporation, Fort Worth, Texas.

HOW TO ORDER:

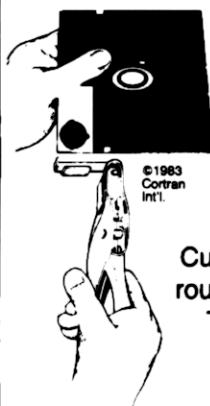
USA (New York): 1 - 212 - 678 0064
Denmark: 45 - 2 - 818191. Tlx. 37825 ec dk.
Use whichever is convenient in your time zone - or write us !
Payment by Cheque, Money Order or Credit Card (Access, Master Charge, VISA and Eurocard). We ship to all countries where Hi-Tech Sales are Legal by US Law. All Prices in US\$.

E-C DATA A/S ✓ 125

E-C

P.O.B. 116 - DK-3460 Birkerød - Denmark

DOUBLES DISKETTE CAPACITY! CUTS YOUR DISK COST 50%!



Now! The back of 5 1/4" Diskettes
can be used for data storage even
with single head disk drives.

- **NIBBLE NOTCH**® Tools make it easy.
- Adds the Precise notch where it's needed.
- Doubles Diskette Space or Money Back!

NIBBLE NOTCH II

Cuts square notch and 1/4" inch
round "index hole." For use with
TRS 80 I and III, Osborne,
Kaypro, IBM and others
needing an "index hole."

only **\$21.90**

add \$2.00 each order P&H
(\$5.00 foreign P&H)

Florida residents add 5% Sales Tax

SATISFACTION GUARANTEED OR YOUR MONEY BACK!

ORDER TODAY!

Toll Free 1-800-642-2536

Florida 305-493-8355

or send Check or Money Order to:



NIBBLE NOTCH® COMPUTER PRODUCTS

4211 NW 75th TERRACE - DEPT. 200 - LAUDERHILL, FL 33319

✓ 281

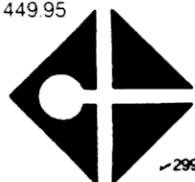
PROJECT 80

TCAD

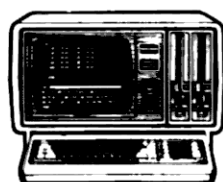
Computer Assisted Drafting for Models III/4/4P with hi-res graphics. Draw, save, edit, zoom, scale exact technical plans. Plotter hardcopy up to 24"x36". Extended professional version has overlays, text labels, block copy, re-scale, clip, merge, rotate, more.

Software \$249.95 - 449.95

CB MICRODEX
1212 N. Sawtelle
Tucson AZ 85716
(602) 326-3502



TRS-80 DISCOUNT



**Computers
at Guaranteed
Low Prices***

ATON CP/M FOR II, 12, 16

EPSON & NEC PRINTERS

DYSAN DISKETTES

HAYES MODEMS

**Desert Sound, Inc.
of California**

1-800-835-5247

Factory Authorized Dealer

TRS-80 is a Reg. Trademark of Tandy Corp.

*Call for FREE CATALOG
and Price Guarantee
Calif. Res. Call 619-244-6883

you're defining a new function. It's given the name following the colon (PORT-B-INC).

The R65F11 puts the number 1 on the stack. The Begin command starts a conditional operation section. DUP duplicates the value on top of the stack. PB C! then pops the top-of-stack value and sends it (as 8 bits) to port B (which is in general-purpose I/O mode by default). The 1 + then increments the top of stack value (previously duplicated so it wouldn't be

lost) to send the next-higher value to port B during the next loop.

The R65F11 pushes number zero onto the stack and the Until command pops the value off the top of the stack. If it is zero, execution starts over at the Begin statement, otherwise the function is done. Since the value zero will always be seen by the Until function, this is an infinite loop. The ending semicolon indicates the end of the function definition. You can now execute the function by merely typing

Quantity	Description	Distributor	Part Number	Price (each)
1	R65F11P Rockwell Forth microcontroller IC (plastic)*	HA	R65F11P	\$50
1	R65FR1P Rockwell Forth development ROM (plastic)*	HA	R65FR1P	\$50
1	6264 8K by 8-bit CMOS static RAM	DR	HM6264P-15	39.95
1	74LS373 8-bit latch (LS TTL)	JDR	74LS373	1.39
1	74LS00 quad two-input NAND gate (LS TTL) IC	JDR	74LS00	.24
1	74LS138 3-to-8 decoder IC	JDR	74LS138	.55
1	LM1488 quad RS-232C driver IC	JDR	LM1488	.69
1	LM1489A quad RS-232C receiver IC	JDR	LM1489	.69
2	ICL7660 DC positive-to-negative voltage converter IC†	RS	276-2335	3.79
2	100 µF/35V electrolytic capacitor (PC mount)†	RS	272-1028	.79
5	.1 µF/50V disc capacitor	RS	272-135	.25
3	10 µF/35V electrolytic capacitor (PC mount)†	RS	272-1025	.59
1	10 µF/35V electrolytic capacitor (PC mount)	RS	272-1025	.59
1	2MHz crystal	DK	X001	2.70
1	4.7k ohm resistor (¼ watt)	RS	271-1330	.08
1	10k ohm resistor (¼ watt)	RS	271-1335	.08
1	1N914 small signal diode‡	RS	276-1122	.10
1	Momentary contact SPST switch (mini)	RS	275-1571	.80
1	40 position cable header (w/w)	DK	R241-ND	5.58
1	DB-25S/RA right angle D-subminiature connector	JDR	DB25SR	4.42

* The R65F11 and R65FR1 cost around \$100 combined. Check with Hamilton/Avnet for price and availability before ordering. Hamilton/Avnet ships orders C.O.D.

† Required only when using the optional -5V circuit.

‡ You can substitute the 1N914 for the 1N4148 in this design.

Hamilton/Avnet Electronics (HA), 32487 Schoolcraft Road, Livonia, MI 48150, 313-522-4700

JDR Microdevices, 1224 S. Bascom Avenue, San Jose, CA 95128, 800-538-5000 or 408-995-5430 outside California; 800-662-6297 within California.

Radio Shack (RS), National Products Division, 900 E. Northside Drive, Fort Worth, TX 76102, 817-870-5662.

Digi-Key Corp. (DK), Highway 32 S., P.O. Box 677, Thief River Falls, MN 55701, 800-346-5144 or 218-681-6674.

Table 1. Parts list and ordering information.

PROJECT 80

IC	GND	- 12V (or - 5V)	+ 5V	+ 5V (or + 12V)
74LS373	10		20	
74LS138	8		16	
74LS00	7		14	
1488	7	1		14
1489A	7		14	

Table 2. IC Power/Ground pin connections.

the function's name, PORT-B-INC. If you were to look at the Port B pins on an oscilloscope, you would see a square wave on each pin, with the frequency cut in half for each higher-order bit.

Conclusion

If you decide to build this project, you should read the R65F11 data sheet and the RSC-Forth user's manual. If you want to include a disk drive and possibly a printer port with your system, Rockwell has a useful application note, "A Low-Cost Development Module for the R65F11 Forth Microcomputer" (see references), which is complete with schematics (even P.C. board masks for photographing).

The Forth high-level language and the 6502 instruction set combine to make a very powerful and effective controller. ■

Write to Roger C. Alford at Washtenaw Digital Systems, P.O. Box 2014, Ann Arbor, MI 48106. Please include a self-addressed, stamped envelope for a reply.

Forth Microcontroller References

R6511 and R65F12

Forth Based Microcomputers.
(document number 29651N49)

A Low-Cost Development Module for the R65F11 Forth Microcomputer.
(document number 29651N65)

Rockwell International Semiconductor Products Division
P.O. Box C
Newport Beach, CA 92660
Mail Code 501-300

NEW PRICES ... LOWER THAN EVER!

LNW'S TEAM COMPUTER \$1095

COMPUTERS

LNW 80 MOD 2 96K/CPM	\$1095
PMC 80 18K TRS80 CLONE	450
SYS/COM/BELTRON 64K APPLE	475
SANYO MBC 550 180K DR	735
SANYO MBC 555 2 180K DRVS.	999
SANYO MBC 555 2 320K DRVS.	1200
IBM 64K, 2 DRV, COLOR BD	2475
NEC PC-8201	450
TANDY 2000	2210

EXPANSIONS

LNW SYSTEM EXPANSION	\$329
HOMES IM2 32K FOR TRS 80 MOD1	129
MDX-6 MOD 3 & 4 UPGRADE	230
HOLMES VID 80+CPM 2.2	350
DOUBLE DENSITY ADAPTER	99
LN DOUBLER 5/8 & DOS+ 3.5	199
HOLMES DOUBLER 5/8	125

PRINTERS

GORILLA BANANNA	\$149
PROWRITER PAR	339
PROWRITER SER	499
PROWRITER 15" PAR	570
PROWRITER 15" SER	670
F-10 40 CPS PAR/SER	999
F-10 55 CPS PAR/SER	1299
F-10 TRACTOR FEED	195

EPSON RX 80	299
EPSON RX 80 FT	399
EPSON FX 80	460
EPSON FX 100	675

OKIDATA 82A	289
OKIDATA 83A	500
OKIDATA 84P	795
OKIDATA 92P	399
OKIDATA 93P	675

STAR GEMINI 10X	299
STAR GEMINI 15X	415
STAR DELTA 10	465
STAR DELTA 15	550

SILVER REED 500 17 CPS D.WH.	369
SILVER REED 550 20 CPS D.WH.	489
SIEMENS PT88 INK JET	899
TOSHIBA 1350 LETTER QUALITY	1270
JUKI 6100	439

CRT MONITORS

AMDEK 300 GREEN	\$139
AMDEK 300 AMBER	159
AMDEK COLOR II RGB	429
AMDEK COLOR I RGB	289

TAXAN KG12N GREEN	129
TAXAN KG12NUY AMBER	139
TAXAN RGB VISION I	289
TAXAN RGB VISION III	470
TAXAN APPLE CARD	99
GORILLA GREEN/AMBER	95

MODEMS

SIGNALMAN MARK VII 300 BD	99
SIGNALMAN MARK XII 1200 BD	279
NOVATION J-CAT 300 BD	104
NOVATION SMART CAT 1200 BD	415
HAYES SMART MODEM 300 BD	205
HAYES SMART MODEM 1200 BD	465

COMMUNICATIONS SPECIAL

MTERM: SMART TERMINAL PROGRAM	
AND VOLKSMODEM 300 BD MODEM	\$99

DISK DRIVES

TANDON 100-1 40 TRK S/S	\$189
TANDON 100-1 BARE	149
TANDON 100-2 40 TRK D/S	255
TANDON 100-2 BARE	210
TANDON 100-4 80 TRK D/S	350
TANDON 100-4 BARE	299

TEAC FD55A 40TRK S/S	200
TEAC FD55A BARE	165
TEAC FD55B 40 TRK D/S	235
TEAC FD55B BARE	180
TEAC FD55F 80 TRK D/S	280
TEAC FD55F BARE	210

SPECIAL

TEAC 54A SAME SPECS AS FD55A	\$150
Tandon 55-15540TR	\$99
CHINON 40 TRS/S	\$129
MATSHUSHITA 40 TRD/S	180

TRS 80 SOFTWARE

LAZYWRITER MOD I	\$149
ELECTRIC WEBSTER MOD I & 3	119
DOS+ 3.5 MOD I & 3	99
MULTIDOS 1.6	79
SUPER UTILITY 3.0	65
OMNITERM 1.6	78
OMNITERM 1.6 MOD IV	78
NEWSSCRIPT 7.6	114
TALLYMASTER	69

ACCOUNTING SPECIAL

GENERAL LEDGER, ACCOUNTS REC.,	
ACCOUNTS PAYABLE, CHECK REGISTER	
INTEGRATED SYSTEM ONLY	\$299

24 HOUR TOLL FREE ORDERS VISA/MASTER CHARGE ONLY: (800) 633-2252 EXT 720

ALL QUESTIONS: (313) 538-1112

MICHIGAN RESIDENTS ADD 4% SALES TAX-SHIPPING. CALL FOR CHARGES. PRICES ARE DISCOUNTED FOR CASH AND MONEY ORDER (NON CERTIFIED CHECKS ALL 2 WEEKS TO CLEAR) MASTER CARD AND VISA ADD 3% NO C.O.D. NO NET TERMS.

VESPA COMPUTER OUTLET

16727 Patton Detroit, MI 48219

Branching Out With Your BBS

Computer bulletin board systems (BBSes) often need to search for information, and the BBS Express is no exception. The BBS searches two lists constantly—the membership log and the data base catalog. Searching lists like these is potentially messy when you consider that they're often long and randomly compiled. Common search methods, such as sorting and sequential searching, aren't efficient because of the random nature of our lists. Using a binary tree, however, is an efficient and conveniently applied method that allows easy access to random information.

This month, we'll discuss the binary tree as it applies exclusively to the membership log. This is an ideal place for a binary tree because the more random the information supplied, the more efficient the binary tree. When employed here, the binary tree produces a sorted list when needed, and finds an entry in a 256-record file with surprisingly few disk accesses.

The example listing in Fig. 1 sets up a random-access file that lets the caller enter his first name. Two additional fields are added to the membership list: a left pointer (LP\$) and a right pointer (RP\$). The GOSUB 870 in line 90 manipulates the two pointers in a way that lets you quickly find a name.

When a user enters a new name on the binary tree, the BBS compares it to the name at the first junction where the tree splits into its left and right branches (see Fig. 2). If the new name is lower in the alphabet than the name it's compared with, it goes to the left branch. Otherwise, it goes to the right branch. The same comparison is made at the next junction, where again the lower name goes to the left. If at the end of the branch, there are no more junctions, the name is added.

At each junction, the remaining items are divided in half. If the tree is balanced, half of the remaining list lies on the left path, the other half on the

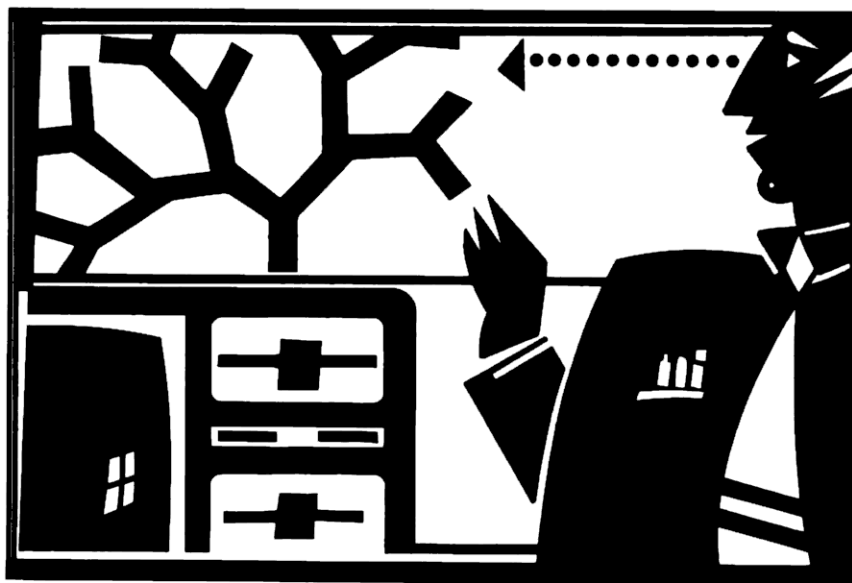


Illustration by Phil Geraci

right. By taking the left or right branch, you effectively ignore half the remaining list. Therefore, if you start with 256 entries on the tree, 128 entries are eliminated after the first comparison. With each respective comparison, you reduce this figure to 64, 32, 16, eight, four, two, and eventually, one. With the binary tree method, we're able to locate an item in just nine comparisons.

Proper Coding

Because the records on a disk are lined up one after another, you're able to arrange the pointers so that they contain an offset from the present record to the next smaller record (for LP\$), or the next larger record (for RP\$). If, for example, you're at record 1, and the next record alphabetically smaller than the name in record 1 is in record 5, and the next larger is record 4, LP\$ will contain 4, and RP\$ will contain 3. When the pointer you want to move is a zero, you've reached the end of a branch, and the BBS adds the name.

Line 870 of both Fig. 1 and the Program Listing tests for EN=1. If

there's only one record in the file, the program exits the search with a return. Otherwise, the BBS initializes record Y to 1.

Line 890 compares CK\$, the name that you want to position, with N1\$, the name from record Y. If CK\$ is greater than N1\$, the BBS sets FS equal to the value of the right pointer. CVI simply converts the string representation of a number in a random file to a number.

If this right pointer is zero, it's set to the difference between record Y and EN, the record written to disk by line 80 of Fig. 1. Then the BBS unites record Y with the updated pointer before it exits the program. If CK\$ is less than or equal to the name in record Y, the BBS repeats the procedure with the left pointer, LP\$. Otherwise, you

The Key Box

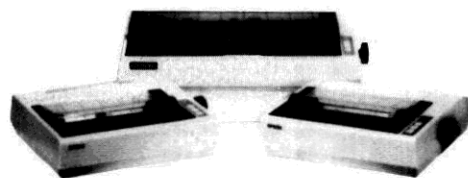
Model III
48K RAM
Disk Basic
Two Disk Drives



DISPLAYED VIDEO IS DRIVING DOWN PRICES ON DISKS!



FREE SHIPPING!



TEC'S NEW HALF-HIGH 40 TRACK DISK DRIVE W/CASE & POWER SUPPLY AT AN INCREDIBLE LOW PRICE!

ONE YEAR
WARRANTY
ON TEACS

\$179.00!!!!

ONE YEAR
WARRANTY
ON TEACS

TANDON 40 TRACK TM-100-1 W/CASE & POWER SUPPLY.....\$199.00

"YOU CAN BUY THE REST BUT WHY NOT BUY ONE OF THE BEST!"

TEAC'S NEW SLIMLINE 40 TRACK W/CASE & POWER SUPPLY\$205.00

TEAC NEW SLIMLINE DOUBLE SIDED 40 TRACK W/CASE & POWER SUPPLY\$240.00

TEAC NEW SLIMLINE DOUBLE SIDED 80 TRACK W/CASE & POWER SUPPLY\$285.00

DUAL VERTICAL CASE & POWER SUPPLY TO ACCOMMODATE TWO SLIMLINE DRIVES.

\$10.00 ADDITIONAL WITH SINGLE DRIVE PURCHASE

DV'S COLOR COMPUTER 1st DRIVE ONLY.....\$329.00

TWO DRIVE 5 1/4" CABLE (FOR MOST COMPUTERS).....\$23.99 WITH GOLD PLATED CONNECTORS

MODEL 1 DOUBLE DENSITY BOARD.....\$85.00

SANYO COMPUTERS

MBC550-128K, 16BIT, ONE 160K DRIVE\$779.00 MBC555 - 128K, 16BIT, TWO 160K DRIVES\$999.00

MBC550-128K, 16BIT, ONE 320K DRIVE\$849.00 MBC555 - 128K, 16BIT, TWO 320K DRIVES\$1299.00

550 SYSTEMS - INCLUDE: MSDOS, WORDSTAR, CALCSTAR, & EASY WRITER SOFTWARE PACKAGES

555 SYSTEMS - INCLUDE: MSDOS, WORDSTAR, CALCSTAR, EASYWRITER, SPELLSTAR, MAILMERGE, & INFOSTAR SOFTWARE PACKAGES

COMREX AMBER MONITOR 9".....\$89.00

HAYES SMART MODEM 300 BAUD.....\$210.00 1200 BAUD.....\$485.00

ONE YEAR WARRANTY ON TEAC DRIVES/180 DAYS ON TEC & TANDON

PRINTER PRICES

WE'RE NOT GOING TO MAKE YOU CALL FOR PRICES—HERE THEY ARE IN BLACK AND WHITE!!!

EPSON

RX80 W/GRAPHTRAX PLUS\$275.00

RX80 FT W/GRAPHTRAX PLUS\$349.00

RX100 W/GRAPHTRAX PLUS\$495.00

FX80 W/GRAPHTRAX PLUS\$495.00

FX100 W/GRAPHTRAX PLUS\$699.00

LQ1500 200 CPS COMING SOON

1 YEAR WARRANTY ON EPSON PRINTERS

PRINTER CABLE 10' LONG W/GOLD PLATED CONNECTORS STARTING AT\$25.99

PR5000 DAISYWHEEL 15 CPS\$395.00

PR5500 DAISYWHEEL 20 CPS\$595.00

GEMINI 10X\$275.00

GEMINI 15X\$395.00

CITOH PROWRITER 8510\$355.00

DWP210\$559.00

DAISYWHEEL II\$1149.00

Visit our two
retail locations at:

886 Ecorse Road
Ypsilanti, MI 48197

(313) 426-5086/(313) 482-4424

or

111 Marshall Street
Litchfield, MI 49252

(517) 542-3280

(517) 542-3939

(517) 542-3947

WE CARRY TRS80 & SANYO COMPUTERS



IMMEDIATE DELIVERY

180 Days Parts and Labor Warranty
DEALER INQUIRIES INVITED

TO ORDER: Call (313) 426-5086 or (313) 482-4424 or (517) 542-3280

(517) 542-3939 (517) 542-3947

OR WRITE: DISPLAYED VIDEO 111 MARSHALL ST., LITCHFIELD, MI 49252

AUTHORIZED SANYO DISTRIBUTOR

*TRS-80 is a trademark of the Tandy Corporation

Prices & Specifications subject to change without notice


```

10 CLS: CLEAR1000: NM=1: CK$=STRING$(20,32)
20 OPEN "R", 2, "TEST/DAT:0"
30 FIELD 2, 20 AS N1$, 2 AS LP$, 2 AS RP$
40 INPUT "ENTER NAME, QUIT TO STOP"; N$
50 IF N$="QUIT" THEN CLOSE: END
60 LSET N1$=N$: LSET LP$=MKI$(0): LSET RP$=MKI$(0)
70 NM=NM+1
80 PUT 2, NM
90 EN=NM: LSET CK$=N$: GOSUB 870
100 GOTO 40
870 Y=1: IF EN=1 THEN RETURN
880 GET 2, Y
890 IF CK$>N1$ THEN FS=CVI(RP$): IF FS=0 THEN LSET
RP$=MKI$(EN-Y): PUT 2, Y: RETURN
900 IF CK$<N1$ THEN FS=CVI(LP$): IF FS=0 THEN LSET
LP$=MKI$(EN-Y): PUT 2, Y: RETURN
910 Y=Y+FS: GOTO 880

```

Figure 1. Sample code for binary tree sort.

```

10 CLS: CLEAR1000: EN=256: CK$=STRING$(20,32)
20 OPEN "R", 2, "TEST/DAT:0"
30 FIELD 2, 20 AS N1$, 2 AS LP$, 2 AS RP$
40 INPUT "ENTER NAME, QUIT TO STOP"; N$
50 IF N$="QUIT" THEN CLOSE: END
60 LSET CK$=N$: GOSUB 940
70 IF ER THEN ? "NO SUCH NAME ON THE LIST"
80 IF NOT ER THEN PRINT "NAME FOUND IN RECORD"; MR
90 GOTO 40
940 IF EN=0 THEN 1010
950 MR=1: ER=0
960 GET 2, MR
970 IF CK$<N1$ THEN FS=CVI(LP$): GOTO 1000
980 IF CK$>N1$ THEN FS=CVI(RP$): GOTO 1000
990 RETURN
1000 MR=MR+FS: IF FS>0 THEN 960 ' REENTER HERE
1010 ER=-1: RETURN

```

Figure 3. Sample code to search the membership log.

```

10 CLS: CLEAR1000: EN=256: SR$=STRING$(255,32)
20 OPEN "R", 2, "TEST/DAT:0"
30 FIELD 2, 20 AS N1$, 2 AS LP$, 2 AS RP$
40 GOSUB 1020
50 PRINT N1$
60 IF NOT ER THEN GOSUB 1080: GOTO 50
70 CLOSE: END
1020 PRINT "Sorting...": MR=1: ER=0: Z=1: FS=1: LSET SR$=CHR$(0)
1030 IF DS=0 THEN ER=-1: CLOSE: RETURN
1040 IF FS=0 THEN GET
2, MR: Z=Z+1: MID$(SR$, Z, 1)=CHR$(MR): FS=CVI(LP$): MR=MR+FS: GOTO 1
040
1050 MR=ASC(MID$(SR$, Z, 1)): Z=Z-1: IF MR=0 THEN
ER=-1: CLOSE: RETURN
1060 GET 2, MR: IF LEFT$(P1$, 1)=CHR$(0) THEN 1080
1070 RETURN
1080 FS=CVI(RP$): MR=MR+FS: GOTO 1040 ' REENTER HERE

```

Figure 4. Sample code to produce a sorted list.

Program Listing. BBS module that creates the membership log binary tree.

```

870 Y=1: IF EN=1 THEN RETURN
880 GET 2, Y
890 IF CK$>N1$ THEN FS=CVI(RP$): IF FS=0 THEN LSET
RP$=MKI$(EN-Y): PUT 2, Y: RETURN
900 IF CK$<N1$ THEN FS=CVI(LP$): IF FS=0 THEN LSET
LP$=MKI$(EN-Y): PUT 2, Y: RETURN
910 Y=Y+FS: GOTO 880
940 IF EN=0 THEN 1010
950 MR=1: ER=0
960 GET 2, MR

```

Listing continued

make Y equal to Y plus FS, which is the offset for either the left branch or the right branch, and then loop to line 880 to repeat the process.

The program code in Fig. 3 lets a caller retrieve a name from the BBS. Lines 10-50 open the file, and let the caller input the name for which he's looking. Line 60 LSETs that name into CK\$ before jumping to the routine that starts at line 940. EN has a value of 256, assuming that the file contains 256 records. The BBS initializes MR, the record number, to 1, while it sets ER, the flag that tells you if the record is found, to zero. If the name from record MR is less than CK\$, line 970 sets FS to CVI(LP\$). If greater, it's sent to the right branch in line 980.

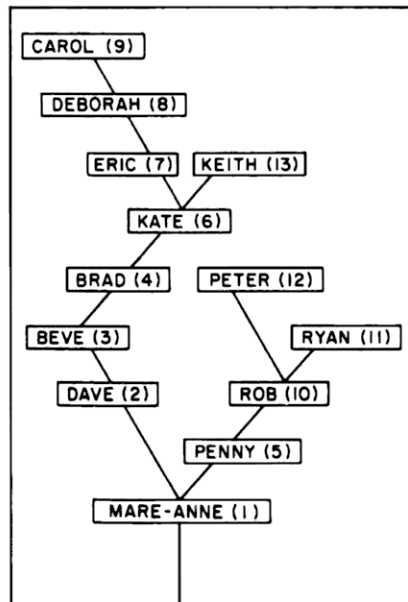


Figure 2. A graphic representation of a binary tree sort. The numbers refer to the order in which the user entered the names.

Line 1000 adds the value of FS to MR. If FS is greater than zero, the routine loops back to line 960 to check the next record. If however, FS is zero, the BBS sets ER to -1 and informs the calling routine that it hasn't found the name.

A Sorted List

The example listing in Fig. 4 produces a sorted list from the binary tree. Line 1040 follows the left pointers to find a zero, creating a path as it moves along. This path, SR\$, is a string of 255 blanks, with its first char-

*The program code
lets a caller
retrieve a name
from the BBS.*

acter set to CHR\$(0) by the LSET command in line 1020. The entire list has been printed when the program backs out of SR to find the CHR\$(0) at the end. The DS in line 1030 of the listing keeps track of the current position in SR for the BBS, though not for the example in Fig. 4.

When line 1040 finds zero, indicating the lowest item on the list, MR is set to the ASCII value of the Zth element of SR in line 1050. If MR is zero, you've printed the entire list. The test for P1\$=CHR\$(0) in line 1060 is part of the module in this month's listing, though it's not part of the sample routine. From this point on, the calling routine in line 1080 loops to line

Listing continued

```

970 IF CK$<N1$ THEN FS=CVI(LP$):GOTO1000
980 IF CK$>N1$ THEN FS=CVI(RP$):GOTO1000
990 RETURN
1000 MR=MR+FS:IF FS>0 THEN 960 ' REENTER HERE
1010 ER=-1:RETURN
1020 PRINT"Sorting...":MR=1:ER=0:Z=1:FS=1:LSET SR$=CHR$(0)
1030 IF DS=0 THEN ER=-1:CLOSE:RETURN
1040 IF FS>0 THEN GET
2,MR:Z=Z+1:MID$(SR$,Z,1)=CHR$(MR):FS=CVI(LP$):MR=MR+FS:GOTO1
040
1050 MR=ASC(MID$(SR$,Z,1)):Z=Z-1:IF MR=0 THEN
ER=-1:CLOSE:RETURN
1060 GET 2,MR:IF LEFT$(P1$,1)=CHR$(0) THEN 1080
1070 RETURN
1080 FS=CVI(RP$):MR=MR+FS:GOTO1040 ' REENTER HERE

```

End

1040 until you print the entire list.

Because your membership log will most likely contain more than 255 names, no attempt is made in the actual coding to produce a membership log sorted by first names only.

For a further discussion on binary tree operation, we recommend Ken Knecht's article, "Plant a Binary Tree" (80 Micro, November 1982, p. 242). ■

The BBS Express, 80 Micro's bulletin board system, is open 24 hours a day. Call us at 603-924-6985 to see the finished product. UART parameters are 300 baud, seven bit words, one stop bit, and even parity.

You can reach J. Stewart Schneider and Charles E. Bowen either through their bulletin board at 606-739-6088 or c/o Saturday Software, P.O. Box 404, Catlettsburg, KY 41129.

UNINTERRUPTIBLE POWER SYSTEMS BY SUN RESEARCH

For complete protection from **Blackout, Brownout, Surge and Spike** specify a **MAYDAY** Uninterruptible Power System by **SUN RESEARCH**.

Eliminate costly downtime and lost data caused by those momentary power losses. Protect your software and hardware from damage caused by sudden drops in line voltage. Isolate your computer system completely from the AC wall circuit with a **MAYDAY** continuous (On-Line) Uninterruptible Power System. Give all your components clean 60Hz sine wave power for efficient operation at a price you can afford.

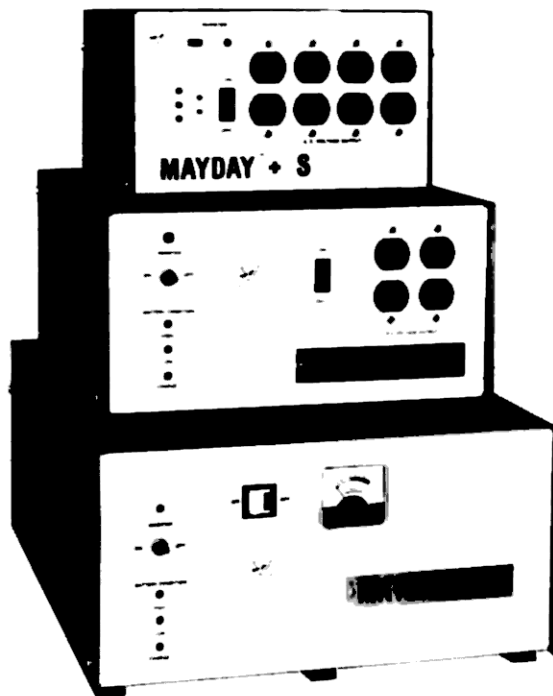
MAYDAY™ UNINTERRUPTIBLE POWER SYSTEMS BY SUN RESEARCH

Available in 150, 300, 600, 1000 and 1500 VA Capacities.

Call 1-603-859-7110



MAYDAY™ Division
SUN RESEARCH, INC.
Old Bay Road
Box 210
New Durham, N.H. 03855



Take Bytes Out of Programs With the Basic Takes Diet

In the beginning you're responsible only to yourself. Your early programming efforts may be ragged and awkward, but lack of elegance is no sin if the program does what you want.

Once your programs gain length and complexity, however, they use more memory and run slower. You need to learn to make listings as short as possible.

Compacted, or "crunched," programs use 20-30 percent less memory and run 5-10 percent faster than standard code. In addition, they use less disk storage space and print out on less paper.

Program crunching falls into two categories: mechanical steps and programming techniques. The former you can learn quickly, while the latter comes with experience.

Candidates for crunching include programs you write yourself and those you key in from *80 Micro* or other sources. When typing in someone else's programs, follow the author's style exactly. Once you've debugged the program and saved it to disk, you can start compressing it.

Mechanical Crunching

Mechanical methods for shortening programs include eliminating spaces, combining material from several lines into one line, removing Remark statements, and using lower line numbers—in that order.

Start by eliminating spaces. This is the simplest change and saves the most space. Once you've debugged a program and understand its flow, you can erase spaces. You can write programs this way, but I suggest using spaces to start so you can pick out routines easily.

On the Models I and III, you must edit each line individually. Type in 500 IF A = 15 THEN GOSUB 1000 ELSE 110 and hit the enter key. Now type in EDIT 500 and move through the line,

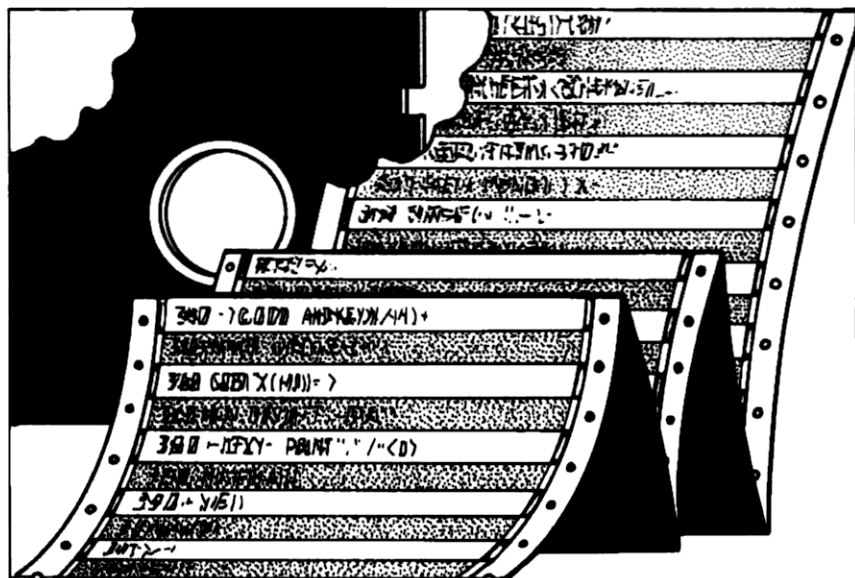


Illustration by Mark S. Fisher

hitting the D key to delete each space. Hit the enter key when you're finished, then list 500. You've crunched your first line.

On the Model 100 you can edit the whole program at once. Be sure that the program exists in Basic mode, then type in EDIT. You can then edit the entire listing as you would a text file.

In the Edit mode, press the F1 key for string search, then hit the space bar and press the enter key. This lets you search for each space in the program.

When you get to a space you want to erase, then press shift and the delete/backspace key at the same time to erase the spaces. Don't eliminate spaces within quotation marks, or from string array material in data lines.

You can also compact programs by combining several lines into one. A Model III Basic line can hold up to 255 characters, including the line number.

```
110 A = 5
120 Z = 20
130 IF A = 5 THEN PRINT "KING"
```

The above listing reduces to one line:

```
110 A = 5:Z = 20:IFA = 5THENPRINT "KING"
```

Notice that I've separated each Basic statement by a colon. Here are a few rules to remember when combining lines:

- You can combine two data lines into one. For example, 110 DATA 1,2,3 and 120 DATA 4,5,6 reduce to 110 DATA 1,2,3,4,5,6. You can't combine a data line with other statements, however.

- You must put a GOTO statement at the end of a line. Your program will never reach statements appearing in the same line after GOTO, since control goes to another line. However, you can put statements after a GOSUB statement. The program reads these statements when it returns.

- You must retain line numbers that are the objects of GOTO, GOSUB, Else, Then, and Resume statements. Here's an example:

```
100 CLS:INPUT X:IFX = 10THEN120
110 GOTO 100
120 PRINT "YOU ENTERED 10"
```

You can't add lines 110 and 120 to line 100 because line 100 branches to line

BASIC TAKES

120 and line 110 sends control to line 100.

- When compacting your programs, go through the listing and list all line numbers to which the program can branch. Refer to the list as you combine lines.

- Don't put statements after an If...Then test. For example:

```
100 INPUT Z
110 IF Z = 2 THEN PRINT "TWO"
120 A = 5
130 PRINT A
```

You can't combine lines 110 and 120 because all material following an If...Then test is valid only if the program meets the test. If you combine the lines, variable A would get a value of zero if Z didn't equal 2. This isn't the intent of the program.

- You can follow an If...Then statement with other statements if your intent is to perform the following statements only if the program passes the If...Then test.

As you gain programming experience, you'll begin to recognize Basic statements that logically go together. The start of your program might look like this:

```
110 CLS: CLEAR 100: DIM A(54): Z = 3: M =
8: A$ = "VICTORY": S = 3.2
```

Consider this style as a one-line checklist for including fundamental program preparations, i.e., clearing string space, dimensioning and initializing variables, and so on.

- For...Next loops, If...Then statements, and small subroutines fit logically together:

```
100 FOR X = 1 TO 5: PRINT X: NEXT X
110 INPUT L: IF L = 5 THEN GOSUB 1000 ELSE
100
120 END
1000 PRINT "THIS IS FUN": RETURN
```

Another way to reduce program size is by eliminating Remark statements (' or REM) and all material that follows. Remark statements are not necessary for program execution. If program control branches to a line containing a Remark statement, delete only the material after the REM.

Some programs contain a remark statement to the right of a Basic statement, for example:

```
100 A = Z: REM This is the value of sales
```

You could cut this line to 100 A = Z.
If you want to use routines in other

Buy the Best CP/M for Tandy computers.

Pickles & Trout CP/M is the product of over four years of experience with Radio Shack computers — and their users. Thousands of people use it with pleasure. So can you.

IT'S FLEXIBLE

With P&T CP/M 2, you can take advantage of every feature of your Mod II/12/16. Choose from among the 2000 or more CP/M-80 programs now on the market. Use either Radio Shack or Corvus hard disk systems. And use Radio Shack or non-Radio Shack printers, plotters, modems, terminals and other peripherals.

IT'S WELL-SUPPORTED

The fully-indexed P&T manual is understandable and comprehensive. And our experienced support staff is always available to help you.

IT'S COMPACT AND POWERFUL

P&T CP/M 2 packs a lot of power into as little as 8.5 Kbytes of RAM. Its many unique features include a master diskette that automatically copies itself, an easily-used system MENU, 20 special utilities, programmable keys, a full-screen editor, a screen print function, and many extra programming tools.

IT'S A BARGAIN

The floppy disk version of P&T CP/M 2 is only \$200. Hard disk versions are \$250. And no hardware modifications are required.

Order today or use the attached coupon to find out more about the best CP/M for your Mod II/12/16.

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

or send us your business card.



Pickles & Trout® 290
P.O. Box 1206, Goleta, California 93116
(805) 685-4641

'80

TRS-80® Radio Shack/Tandy Corporation; CP/M® Digital Research;
Pickles & Trout® Pickles & Trout © 1984 Pickles & Trout



**NOW the One Person Who Cares Most About Your
Computer Can Protect Its Data —**

YOU!

**Introducing... Memory Minder from
J&M Systems**

**The most advanced disk drive
testing program on the market.**

Until recently, only trained technicians using special equipment could check your disk drives for potential or actual problems. But now, thanks to major breakthroughs by J&M Systems, Ltd. and Dysan Corporation, **YOU** can be your own computer's technician.

Memory Minder is the most comprehensive disk diagnostic program available for microcomputers. With **Memory Minder**, you can periodically test disk drives to monitor long-term drift of head alignment, index hole timing, spindle speed, directional seek, and many other parameters. Then, if your head is out of alignment, **Memory Minder** can accurately align it once again. Early detection and correction of these problems will help protect you against costly data loss and down time.

And with **Memory Minder**, you don't need a technical background to perform these tests. Simply follow the easy instructions in the manual or on the screen's menu. Now you can

use state-of-the-art software to care for your hardware.

Memory Minder is currently available for IBM, TRS-80, Kaypro and Sanyo systems. Only from J&M Systems. Prices start at \$79.

_____ I'd like more information on **Memory Minder**.
Please send me your complete brochures

_____ Send me information on other line products
from J&M Systems

I have the following computer: _____

Name _____

Address _____

City _____ State _____ Zip _____



101

J & M SYSTEMS, LTD.

**15100A Central Avenue S.E.
Albuquerque, N.M. 87123
505/292-4182**

Another way to reduce program size is to eliminate Remark statements since they aren't necessary for program execution.

programs, save a version of the program with Remark statements to keep the routines easily recognizable.

Because a line 6300 uses more characters than a line 5, lower line numbers save memory. Even short programs profit from renumbering.

Lines containing GOSUB, GOTO, Else, Then, and Resume statements have objective line numbers within them that make program renumbering tricky. The safest way to renumber a long program is with a utility program.

For Level II Basic I recommend using Line Renumber from Radio Shack. Use the Name command in Disk Basic. For the Model 100, use Beve Woodbury's Renumber 100 program (August 1983, p. 206).

When writing a program, increment line numbers by at least 10 to leave room for adding new lines.

Experienced Crunching

Beyond the rules suggested above, techniques for shorter programs come from experience. You can always find exceptions to every rule, and the list of techniques is too cumbersome to detail.

However, here are some tips that I found valuable in learning programming:

- Use variables instead of literals if the program uses the same value more than once in a program.
- Use subroutines for any repeated program action. A good example is a timing routine:

```
1000 FORT = ITO1000:NEXTT:RETURN
```

Enter a GOSUB where needed.

- Always dimension arrays, but don't reserve more space than necessary.
- Shorten long variable names to two characters (LIGHT\$ to LI\$). The computer only reads the first two characters.

- Shorten If...Then tests. For example, the lines

```
100 INPUTX
110 IF X = 1 THEN GOSUB 1000
120 IF X = 2 THEN GOSUB 2000
130 IF X = 3 THEN GOSUB 3000
```

reduce to one line:

```
1000INPUTX:ONXGOSUB1000,2000,3000
```

- Store values in arrays. This makes it easier to keep track of them for use.
- Pack the longest string into the smallest variable possible. Use DEFSTR to express an often used string variable by a single letter (A instead of AS).
- Avoid parentheses when possible, but don't hesitate to use them when needed.

Finally, here's a byte-eating mistake that drove me to distraction as a beginner. I included a GOSUB without a Return statement. A nonreturned GOSUB uses several bytes every time the GOSUB occurs. Type in and run the following listing:

```
100 REM * Byte Eater
110 CLS
120 GOSUB 140
130 GOTO 120
140 PRINT FRE(0)
150 GOTO 120
160 RETURN
```

Lines 130 and 160 never execute. The program GOSUBs from lines 120 to 140, where it prints the remaining memory. Then the GOTO in line 150 returns the program to line 120. This is where the error occurs.

This cycle repeats until an OM (out of memory) error occurs. A long listing doesn't take long to crash. The moral is to exit a subroutine only with a Return statement. The only exception is if you're ending the program.

Look at the listings of some of the first programs you wrote and see where you can cut without damaging the program. You'll be surprised by the succinct listings that result, and by the sophistication you've obtained since you started programming. See you next month.

For...Next Month

In my next column I'll cover For...Next loops. See you then. ■

Contact Richard Ramella at 1493 Mountain View Ave., Chico, CA 95926.

FOR TRS-80 MODELS 1, 3 & 4
IBM PC, XT, AND COMPAQ

THREE TOUGH QUESTIONS WITH ONE EASY ANSWER:

- 1. WHEN IS A COMPUTER LANGUAGE NOT A LANGUAGE?**
MMSFORTH includes DOS, Assembler and high level commands and extraordinary utilities, extends to become any other language (or application), is an interpreter and a compiler, and is remarkably fast and compact!
- 2. WHICH SOFTWARE RUNS THE SAME DISKS IN IBM PC AND TRS-80 MODEL 4?**
MMSFORTH disks run on those and Compaq, and TRS-80 Model 3, and Tandy 1200, and TRS-80 Model 1, and AT&T 6300, etc., with your choice of formats up to 200K single-sided or 400K double-sided!
- 3. WHO OFFERS SOURCE CODE WITH ITS LANGUAGE, UTILITIES, DATABASE, WORD PROCESSOR AND COMMUNICATIONS SOFTWARE?**
Nearly all MMSFORTH software includes source code.

mmsFORTH

All the software
your computer may ever need.

The total software environment for
IBM PC, TRS-80 Model 1, 3, 4 and
close friends.

- Personal License (required):
MMSFORTH System Disk (IBM PC) \$249.95
MMSFORTH System Disk (TRS-80 1, 3 or 4) 129.95
- Personal License (optional modules):
FORTHCOM communications module \$ 39.95
UTILITIES 39.95
GAMES 39.95
EXPERT-2 expert system 99.95
DATAHANDLER 99.95
DATAHANDLER-PLUS (PC only, 128K req.) 99.95
FORTHWRITE word processor 179.95
- Corporate Site License
Extensions from \$1,000
- Some recommended Forth books:
UNDERSTANDING FORTH (overview) \$ 2.95
STARTING FORTH (programming) 19.95
THINKING FORTH (technique) 19.95
BEGINNING FORTH (re MMSFORTH) 19.95

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

137

Encore! Encore!

More Basic Tricks

Last month I discussed three ways to add new commands to TRS-80 Basic: taking over an existing command in Disk Basic, adding to a command such as CMD, and interrupting Basic's parser routing. As I stated in that column, there is yet another way to add extensions to Basic.

Basic's low memory (41A6-41E4 hexadecimal [hex]) contains a set of 21 3-byte DOS exits, or links to normal Basic processing. These exits let DOS programmers add extra features to Disk Basic; the differences in the Basics supplied with the various DOSes result from how the DOS programmers implemented the DOS exit routines.

In a tape-based system, Basic fills almost all these exits with a Return instruction. The Return command (0C9 hex) is a tip-off that the Basic interpreter is looking for a subroutine in each location, and that it calls each from one or more specific locations in ROM. To add new features to Basic, all you need to do is link a subroutine to the correct DOS exit. If you write the new routine correctly, you can add features without giving up anything that already exists in your favorite Disk Basic.

The Table lists the DOS exits, their call addresses in ROM, the normal use of each, and possible additional uses. As in past columns, I've drawn from Jack Decker's *TRS-80 ROM Routines Documented* (The Alternate Source, 704 N. Pennsylvania Ave., Lansing, MI 48906) and James Farvour's *Microsoft Basic Decoded* (IJG Inc., 1953 W. 11th St., Upland, CA 91786).

The Key Box



Models I and III
32K RAM
Disk Basic
Assembly Language
Editor/Assembler



Illustration by Peter Bono

Table. Model I/III DOS exits. Shown are the DOS exits, their call addresses in ROM, the normal use of each, and possible additional uses.

Error-handling 41A6 hex	Called from 19EC hex to report an error when Basic stops normal processing. Used by Disk Basic to provide long error messages. Use this link to provide your own error messages or to trap certain kinds of errors and offer new ways to deal with them.
USR routine 41A9 hex	Called from 27FE hex, the entrance to the USR handler in Basic. Used by Disk Basic to add the necessary code for 10 USR routines instead of the single routine in cassette Basic. You can use this link to add several more USR commands (perhaps USR A-USR Z) in addition to the 10 normally available.
Ready prompt 41AC hex	Called from 1A1C hex just before entering or reentering Basic's command mode. You could link a program here to change the Ready prompt or add new activities just before each Ready message appears. With carefully written code, you could change the entire action of Basic, perhaps even merging it with a "foreign" language or interpreter.
Input buffer 41AF	Called from 0368 hex, near the start of Basic's routine, to input a line from the keyboard to the I/O buffer.
Line is tokenized 41B2 hex	Called from 1AA1 hex, immediately after you've tokenized a new line of Basic. When Basic calls this link, HL points to the tokenized line. You could patch a utility into this link to trap syntax errors as you write program code instead of when the program runs.
Place line in program 41B5 hex	Called from 1AEC hex, immediately after you update Basic's table of program lines. After the call to 41B5 hex, Basic calls the Clear routine at 1B5D hex and then calls this DOS exit from 1AF2

Table continued

SOFTWARE PRICE WAR

\$24.95

30 Day Money Back Guarantee

These are complete software systems supplied to you on a **TRSDOS 1.3** system diskette. All systems fully menu driven — user friendly just insert diskettes, reset and go. Systems are supplied with full documentation (although most users report that they don't read it).

This is a sample of my mail

"Your PAYROLL program is great — I use it for all my accounts — it's quite a time saver."
Hampton, NJ

"I received your PAYROLL program yesterday and was impressed by it. Hence I am enclosing a Cashier's check for..."
Jacksonville Beach, FL

"A friend showed off his possession of your check register system to me and I want a copy for my personal use."
Bloomington, IL

"We have received the first two programs and have found them to be quite sophisticated and are anxious to try another. Please accept my order for..."
Durango, CO

All systems are on a TRSDOS 1.3 diskette ready to run on a TRS 80 Model III or Model IV in III Mode.

AND THE BEST PART... ANY SYSTEM ONLY \$24.95

LYNN'S PAYROLL SYSTEM

Complete record keeping & payroll calculation. To include your state's unemployment tax & forms, detailed 941 form, prints paychecks & W-2's.

LYNN'S ACCOUNTS RECEIVABLE SYSTEM

Single entry — open invoice system. Prints invoice and statements. Built in aging report.

LYNN'S CHECK REGISTER SYSTEM

Prints checks. Register for any month, reconciliation statement.

1,000 checks per month — 220 expense accounts.

LYNN'S TRSDOS UTILITY PROGRAMS

For TRSDOS 1.3 includes short directory (file names only), cursor directory (allows cursor access to CMD, BASIC, and "DO" Files), and a 2K Print Spooler. Menu installs utilities on existing TRSDOS Diskettes.

LYNN'S E-Z MAIL SYSTEM

Sort by name, zip code, state. 2,500 names. E-Z edit.

Joe Lynn



Computer Services
23501 W. Gagne Lane
Plainfield, Illinois 60544
815/436-4477



LYNN'S MAILING LIST

\$19.95 EACH DISKETTE

Over 2,000 names on a diskette. East half or west half of U.S. to be used with Lynn's E-Z mail.

ALSO AVAILABLE:

VERBATIM DISKETTES \$20

YES, PLEASE SEND ME:

- ☐ LYNN'S PAYROLL SYSTEM
- ☐ LYNN'S ACCOUNT RECEIVABLE
- ☐ LYNN'S CHECK REGISTER SYSTEM
- ☐ LYNN'S TRSDOS UTILITY PROGRAMS
- ☐ LYNN'S E-Z MAIL SYSTEM
- ☐ VERBATIM DISKETTES
- ☐ I'M INTERESTED — SEND ME MORE INFO.

Please include \$3.00 shipping (plus \$1.65 if C.O.D.)

Illinois residents add 6 1/4% sales tax

5% surcharge for credit card orders

Total amount enclosed _____

☐ CHECK/MO ☐ VISA ☐ MC ☐ C.O.D.

CARD # _____ EXP. DATE _____

SIGNATURE _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

JOE LYNN COMPUTER SERVICES
23501 W. Gagne Lane, Plainfield, IL 60544

112

Table continued

Automatic close 41BB hex	hex. If you want to keep Basic from erasing variables values each time you change a line, you could patch through these two points. However, your program would have to recognize if the program had expanded into the variables tables during an editing session.
PRINT # processing 41BE hex	Called from 1B8C hex and 1DB0 hex, during New and End processing, to allow disk Basic to close any files that a program has left open.
Byte output 41C1 hex	At the end of each Print command, Basic calls this link from 2174 hex. Use it to mark the end of disk output after a PRINT# statement.
Keyboard scan 41C4 hex	Use the ROM routine that begins at 032A hex to send a single byte to any device. It calls this DOS exit from 032C hex so that it can handle output to disk in the same manner as output to other devices.
Run processing 41C7 hex	The ROM keyboard scan, at 0358 hex, calls this DOS exit. Basic uses this scan to process INKEY\$ and after the completion of each command when the system searches for either a break or a shift @ pause. Most single-step utilities are linked into the system here; however, unless you skillfully code them, such routines are often incompatible with any program that uses the INKEY\$ function.
PRINT # processing 41CA hex	Called from 1EA6 hex whenever you follow the Run command by either a file name or a line number. By using special parameters instead of a file name, you could patch new utilities and programs into this DOS Exit.
Print a number 41CD hex	This link is related to 41BE hex above. It is called at the beginning of print processing from 206F hex to check for possible output to disk with a PRINT # statement.
Carriage return 41D0 hex	During print processing, a call is made from 20C6 hex to this exit after the computer converts a numeric item into an ASCII string and just before it prints it. If you want to print numbers in binary or hex, you could interrupt Basic through this link and change the print string.
Tab processing 41D3	Called from 2103 hex (from the Print routine just after code that sends a carriage return), you usually use this exit to keep the computer from splitting numeric items between two screen lines. You could use it to add screen wraparound of words in a string.
INPUT# processing 41D6 hex	Called from 2108 and 2141 hex. The first is during printing with comma tabs and the second during processing of Tab statements. You could use this link to increase the length of permissible tabs to the range of 0-255 instead of 0-63 or 0-127, since the original tab value is still held in Basic's numeric accumulator at 4121 and 4122 hex.
Left-side MID\$ 41D9 hex	Called at the beginning of input processing from 219E hex to check for an INPUT # command and provide input from a disk file.
Variables assignment 41DC hex	The only DOS exit the Basic interpreter jumps to instead of calls. Use it to allow MID\$ on the left side of an equals sign.
Input and List 41DF hex	During processing of Read and Input statements, after the computer receives a value and just before it assigns a variable, Basic calls this Exit from 222D hex.
	Basic calls this exit twice: from 2278 hex, just after the computer assigns an input value to a variable and just before Basic starts to search for extra data that will generate an "?Extra Ignored" message, and again from 2B44 hex, in the middle of list processing. The second call is the most interesting, because Basic has already found the beginning and end of the program in memory and you can change the manner in which Basic displays the program.

Table continued

Some DOS exits offer more possibilities for extending Basic than others. The Program Listing demonstrates one change you can make with the USR exit at 41A9 hex. This program adds a new command, USR A, to the 10 possible USR routines Basic allows. You could easily modify the program to allow USR B-USR Z as well. The demonstration program merely returns the address of a string in memory; however, it also demonstrates how you can use additional USR routines.

The first section of the program, up to line 340, implements the new routine at the DOS USR routine link. Load the program into memory while you're in Basic (or load it before you enter Basic), then type in:

```
DEFUSR = &H7800: A = USR(0)
CLEAR
```

The computer links the actual program (lines 440-750) into the system, moves it to the top of available memory, and protects it there.

The program begins by looking for an A following the USR command. If it doesn't find the A, control passes to the regular DOS USR code. When it does find an A, the program looks for a left parenthesis; if it can't find one, it stops execution and generates a syntax error message.

The program begins its work (from line 620 on) only when it finds "USR A (" in the input string. The program calls a ROM routine to evaluate the expression in parentheses and uses another ROM routine to ensure that the expression is a string. Notice that the computer saves the updated HL pointer on the stack, as well as a return address of 0890 hex; you need both for a successful return to Basic with a jump to 0A9A hex.

Besides using the USR link to add commands to Basic, you could also use the error link at 41A6 hex. Basic sees a new command as a syntax error, so it calls 41A6 hex if you haven't set up an error trap with an On Error GOTO statement in your Basic program. Basic only calls 41A6 hex when it wants to stop normal processing with an error message; once you establish an error trap, Basic passes control to it instead of halting and completely ignoring your new feature. New commands that you patch into the error link, therefore, don't function nor-

YOUR BEST BUYS ARE WITH SOUTHWESTERN DIGITAL

TANDY 1000 / 1200

TANDON DOUBLE SIDED FULL SIZE DRIVES BARE	\$189.
TANDON DOUBLE SIDED FULL SIZE DRIVE WITH CASE	\$239.
TANDON DOUBLE SIDED 1/2 HEIGHT DRIVES BARE	\$159.
TANDON DOUBLE SIDED 1/2 HEIGHT DRIVE WITH CASE	\$209.
64K MEMORY (9 CHIPS)	\$ 50.
HAYES 1200B	\$399.
HERCULES COLOR CARD	\$209.
HERCULES GRAPHICS CARD	\$379.
PERSYST COLOR CARD	\$209.
PERSYST MONICHROME CARD	\$259.
QUADRAM COLOR CARD	\$219.
QUADRAM EXPANDED QUADBOARD OK	\$249.
QUADRAM QUADBOARD II OK	\$249.
QUADRAM 512+ 64K	\$249.
QUADRAM PARALLEL BOARD WITH 8' CABLE	\$ 84.
QUAD I/O PARALLEL, SERIAL, CLOCK, AND GAME PORT CARD	\$189
SEATTLE RAM +6 OK	\$229.
SEATTLE RAM +3 OK	\$199.
SEATTLE RAM + OK	\$149.
STB SUPER RIO 64K	\$349.
STB RIO 64K	\$329.

MODEL III / IV

MODEL 3/4 RS232C KIT	\$ 59.
MODEL 3/4 DRIVE KIT WITHOUT DRIVES	\$190.
MODEL 3/4 DRIVE 0 UPGRADE	\$339.
MODEL 3/4 DRIVE 1 UPGRADE	\$149.
MODEL 3/4 DRIVE 0 AND 1 UPGRADE	\$499.
MODEL 3 16K UPGRADE KIT	\$ 13.
MODEL 4/4P 64K UPGRADE	\$ 45.
PAL FOR MODEL 4 64-128K UPGRADE	\$ 17.
MODEL 1/3/4 EXTERNAL DISK DRIVE	\$169.
MODEL 1/3/4/4P PRINTER CABLE	\$ 19.
TANDON SINGLE SIDED 1/2 HEIGHT BARE DRIVE	\$129.
TANDON DOUBLE SIDED 1/2 HEIGHT BARE DRIVE	\$159.
TANDON SINGLE SIDED FULL SIZE DRIVE	\$149.
TANDON DOUBLE SIDED FULL SIZE DRIVE	\$189.

COLOR COMPUTER

DRIVE 0 FOR COCO	\$279.
DRIVE 1 FOR COCO	\$169.
DRIVE 0 & 1 FOR COCO	\$428.
64K KIT (8 CHIPS)	\$ 45.
HJL KEYBOARD	\$ 69.
MICRONIX KEYBOARD	\$ 69.
KEYTRONIC KEYBOARD	\$ 79.
PARALLEL PRINTER ADAPTER	\$ 50.

Ordering Information

All prices reflect a pre-made discount for cash. Visa MasterCard orders are at regular price (add 5%).

Mail your payment directly to us or call your order in today. All non-certified funds are held for proper clearance.

PRINTERS

OKIDATA 82	\$329
OKIDATA 93	\$689.
OKIDATA 84	\$875.
PANASONIC 1090	\$279.
PANASONIC 1091	\$339.
PROWRITER 8510 AP	\$319.

DISKETTES

FLIP AND FILE 50 DISKETTE HOLDER	\$ 14.
VERBATIM 525-01 DATALIFE BOX OF 10 SS/DD	\$ 20.
VERBATIM 550-01 DATALIFE BOX OF 10 DS/DD	\$ 26.

BUFFERS

QUADRAM MICROFAZER PRINTER BUFFER 8K	\$129.
EACH ADDITIONAL 8K	\$ 6.

MODEL 1000 HARD DRIVE

\$775.

10 MEGABYTES READY TO PLUG IN AND GO !

*Why waste money? This Hard Drive mounts internal to
upgrade your 1000 to the storage capacity of a 1200.*

Installation only requires a screwdriver.

THIS MONTHS SPECIAL

COLOR COMPUTER DRIVE 0

\$249.

COMPLETE

**SOUTH
SW
WESTERN
DIGITAL**

✓ 444

1-713-480-3296
2515 W. Main #337, Houston, Texas 77098

Table continued

SYSTEM Command Called from 02B2 hex, during processing of the System command and just before the "*" prompt. If a system tape, while loading, places a jump to its starting address here, it will begin execution without returning to the prompt. However, unless the program replaces the Return instruction to 41E2 hex, the computer can execute no other system commands until you reboot.

End

Program Listing. Demonstration of a change to a DOS exit.

```

00100 ; Demonstration of 'USR A'
00110 ; connected to Basic through
00120 ; the 41A9H USR DOS Exit
00130 ;
00140 ;*** Initialize 'USR A' command
00150 ;
00160 ; To run program, see text
00170 ;
40B1 00180 BHIMEM EQU 40B1H ;Basic's memory top
00190 ;
7800 00200 ORG 7800H ;Temporary address
7800 2AB140 00210 LD HL,(BHIMEM) ;Get current memory top
7803 012700 00220 LD BC,LAST-START+1 ;BC = program length
7806 AF 00230 XOR A ;Clear carry flag
7807 ED42 00240 SBC HL,BC ;HL==> New memory top
7809 22B140 00250 LD (BHIMEM),HL ;Save new address
780C 23 00260 INC HL ;HL==> new routine addr.
780D DD21A941 00270 LD IX,41A9H ;IX==> USR DOS Exit
7811 DD5E01 00280 LD E,(IX+1) ;Load DOS's USR addr.
7814 DD5602 00290 LD D,(IX+2) ; into DE
7817 DD7501 00300 LD (IX+1),L ;Hook in our routine
781A DD7402 00310 LD (IX+2),H ; as first in line
781D EB 00320 EX DE,HL ;DE==> destination addr.
781E 22D78 00330 LD (RETURN+1),HL ;Save original addr.
7821 212778 00340 LD HL,START ;HL==> Beg. of program
7824 EDB0 00350 LDIR ;Relocate to prot. memory
7826 C9 00360 RET ;Return to Basic
00370 ;
00380 ;NOTE -- Be sure to issue a CLEAR command after
00390 ; running this initialization program
00400 ;
00410 ;Beginning of actual routine
00420 ; Check for 'USR A'
00430 ;
7827 E5 00440 START PUSH HL ;Save Basic's pointer
7828 D7 00450 RST 10H ;Get next character
7829 FE41 00460 CP 'A' ;Our turn?
782B E1 00470 POP HL ;Restore pointer
782C C20000 00480 RETURN JP NZ,$-$ ;Go to regular USR if not
00490 ;
00500 ; 'USR A' found -- check for '('
00510 ;
782F F1 00520 POP AF ;Clear return addr.
7830 D7 00530 RST 10H ;HL==> 'A'
7831 D7 00540 RST 10H ;HL==> '('
7832 7E 00550 LD A,(HL) ;Get character
7833 FE28 00560 CP '(' ;Is it a '(' ?
7835 C29719 00570 JP NZ,1997H ;Syntax error if not
00580 ;
00590 ; 'USR A (' found -- evaluate expression
00600 ; and find string address
00610 ;
7838 CD2C25 00620 CALL 252CH ;Evaluate expression
783B E5 00630 PUSH HL ;Save ptr. on stack
783C 219008 00640 LD HL,0890H ;Return addr.
783F E5 00650 PUSH HL ;Put it on stack
00660 ;
7840 CDF40A 00670 CALL 0AF4H ;Check for string
00680 ;Type Mismatch if not
7843 2A2141 00690 LD HL,(4121H) ;VARPTR into HL
7846 23 00700 INC HL ;HL==>String addr.
7847 5E 00710 LD E,(HL) ;Put string addr.
7848 23 00720 INC HL ; into
7849 56 00730 LD D,(HL) ; DE register
784A EB 00740 EX DE,HL ;HL has string addr.
784B C39A0A 00750 JP 0A9AH ;Return addr. to Basic
784D 00760 LAST EQU $-1 ;Mark prog. end
00770 ;
00780 ;
00790 ; Test program for Basic:
00800 ; 10 AS = "Where am I?"
00810 ; 20 B = USR A (AS)
00820 ; 30 PRINT B
00830 ; 40 FOR I = B TO B+10
00840 ; 50 PRINT CHR$(PEEK(I));
00850 ; 60 NEXT I
00860 ;
00870 ;
7800 00870 END INIT
00000 Total errors

```

End

Radio Shack just recently changed Model III ROMs in the newest Model 4's at addresses below 3000 hex.

mally in all Basic programs, so you're probably better off using one of the other techniques instead.

A Warning

Just as I was finishing this column (in late September 1984), I read a report that Radio Shack changed the Model III ROMs in the newest Model 4's at addresses below 3000 hex. Radio Shack has changed the Model III ROM addresses above 3000 hex so many times that most programmers have learned to use only those routines through the jump addresses at the beginning of that section of ROM. However, if the report is true, this is the first time (that I know of) that Radio Shack has altered the ROMs below 3000 hex since the Model III was introduced, and the changes could mean that programs such as the Listing, which use those routines, will no longer work.

If any reader can send me a list of the changes that have been made or the differences between any Model III ROMs and the newest Model 4 ROMs, I'll devote part of a future column to the changes and, of course, give you credit. Until then, I cannot guarantee that programs presented in this column will always run on the newest versions of the Model 4, although I hope the changes are not extensive and that most programs will still perform normally. ■

You can contact Hardin Brothers through CompuServe. Go PCS-117 to the Writers' and Editors' SIG (WESIG) and leave your message addressed to him. Feel free to join in discussions started by others.

You can also write to Hardin at 280 N. Campus Ave., Upland, CA 91786. Enclose a stamped, self-addressed envelope if you want a reply.

DANGER: LOOSE PICO NUTS

It's catching. You, too, will go nuts over briefcase-size computers.

These lap-sized "picocomputers" are the indispensable new tool you'll need to get ahead.

But which pico should you buy?

Read *PICO—The Briefcase Computer Report*, and you'll learn which pico is best for you: your word processing, your spread sheets, your data bases. The best pico for your successful business management.

You need a picocomputer right now. Read *PICO*, and you'll learn which pico is your best investment.



To subscribe:

Call 1-800-227-1053

Or mail in this completed form to:

PICO

150 South Main St.

Woodridge NJ 07075

☐ Enter my subscription to *PICO—The Briefcase Computer Report*, 12 monthly issues for \$19.97.

☐ Send me a *PICO* Product Evaluation Kit so I can help evaluate pico products.

☐ Check enclosed ☐ Bill me

☐ MC ☐ VISA ☐ AE 752132

Exp. date _____

Card no. _____

Name _____

Address _____

City _____

State _____ ZIP _____

PROGRAM PACKAGING

Complete line of program packaging.

• Tandy 2000 style cloth binders & slips for 5½ x 8½, \$10.50; 10+, \$9.50.

• Vinyl binders for 8½ x 11 page size. Clear pockets on front and spine for your program identification. Excellent quality.

Ring	1-9	10-50	100+
1"	4.00	3.25	2.75
1½"	5.00	4.25	3.75
2"	5.50	4.75	4.25

• Vinyl portfolios for games and utilities. For 5½ x 8½ page, with clear pocket on cover, pockets inside for disk and manual.

1-9 \$2.50; 10-49 \$2.25; 50+ \$2.00.

• Many other items for software developers and users. FREE 32 page CATALOG. Min. order \$35.

**ANTHROPOMORPHIC
SYSTEMS, LIMITED**

ELEPHANT PREMIUM DISKS



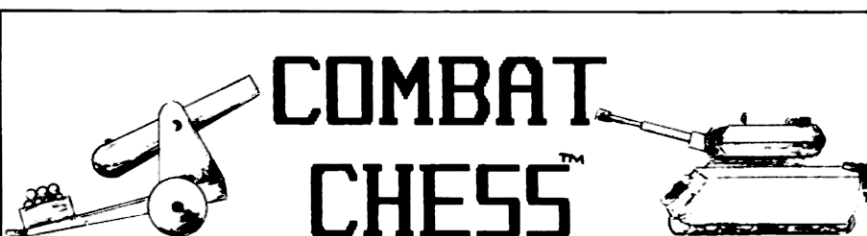
Certified error free. Meets 150% of ANSI standard. Static free plastic packaging to protect your data. Unconditional warranty. Tyvek envelopes, labels and hub rings. Boxes of 10.

"NEVER FORGETS"

List	1	2-9	10+
SS/DD	38.50	23.00	19.25
DS/DD	48.00	28.00	24.00
DS/QD	67.00	37.50	33.50

These are the NEW *Silver Premium* disks. Don't confuse with the less desirable yellow package.

376 E. St. Charles Road
Dept. 80, Lombard, IL 60148
(312) 629-5160



For 1600 years Chess has challenged the greatest thinkers of mankind.

Now in the computer age comes the greatest intellectual challenge of all, computer activated chess, with chess men that move continuously across the chess board, each seemingly on its own accord, but under your direction.

COMBAT CHESS is a totally new dimension both in chess and in computer games. One or any number of chessmen can move continuously across the chess board each capturing or destroying the enemy automatically upon contact according to the rules of chess. You can program your army each time your turn comes around and then you are the observer as your orders are carried out.

Did chess play a part in the greatness of any of the statesmen of History? Perhaps you can discover the answer on your computer. Sharpen your intellect with **COMBAT CHESS**.

We guarantee that **Combat Chess** is the most exciting, the most intellectually stimulating, the most interesting and the most fun of any computer game yet invented or your money back. The game is fast or slow according to your desire and will liven up any party - Requires two players who challenge one another.

INTRODUCTORY OFFER \$49.95

(Regular price \$69.50)

Plus shipping - Visa/Mastercard **QOD's BK - Model III and IV.**

PROGRAMMERS -- We will pay \$500 for the best, in our opinion, improvement of the **Combat Chess** disk plus we will pay a 3% royalty for a period of 2 years on any such improvements sold by us. We will also pay the same amounts for the best anti-pirate protection scheme submitted. All submissions must be in our office before May 1, 1985. Those accepted will be notified within 45 days. All submitters will receive a reply. Those wishing to submit a program for consideration may add \$5.00 for a source code disk listing the program in basic. No purchase is required.

ALLIED SYSTEMS CO.

Trona, Calif. 93562

(619) 372-5355

Box 245

140

HAS YOUR COMPUTER SUPPLIER DESERTED YOU?

**Look no further.
Perry Computers can meet all
your needs for major brand items.**

Perry Computers has been in the computer business for seven years, and will be there when you need us. We don't believe in deserting you.

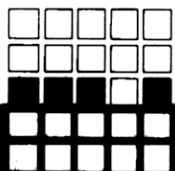
Shop With us Toll Free - Simply call our Toll Free number to place your order. Our knowledgeable & courteous staff will be glad to take your order and answer your questions.

Choose From Top Quality Merchandise - All merchandise sold by Perry Computer is name brand with manufacturer's warranty. All items are the same as you would buy locally, 100% original, no upgrades. If a problem does occur, just call us on our **Customer Service Hotline 517-625-4268.**

FOR ORDERS CALL 1-800-248-3823

Watch For Monthly Specials - On a variety of systems and accessories. If you are stepping up to a more powerful system, expanding or a first time user, be sure to call about products and prices.

Name Brands - RADIO SHACK, EPSON, COLUMBIA, SANYO, COMREX, OKIDATA, TRANSTAR, STAR, AMDEK, BOTEK, ELEPHANT, HAYES, VERBATIM, JUKI, SCOTCH, GORILLA, VIDEO PLUS, TELEWRITER, VIP, TOM MIX, C. ITOH, SKC, MANNESMAN TALLY, ANCHOR SIGNALMAN, IDS, KEYTRONICS, MOUSE SYSTEMS, PRINCETON GRAPHICS, ANADEK, CARDCO, TOSHIBA, ORANGE MICRO, MICROBUFFER AND MORE. If you don't see what you're looking for, give us a call. If at all possible we'll get it for you.



PERRY COMPUTERS

131 N. Main St. P.O. Box 156, PERRY, MI 48872

ALPS' Utilities To the Rescue

This month I'll concentrate on commercial programs for the Model 2000: ALPS' new line of utilities, Lotus' 1-2-3 printer support, and file security software. But I'll begin with a brief mention of the 2000's new competition in the high-end micro-computer market.

Something Old, Something New

The closing months of 1984 brought some startling introductions. Tandy released its Model 1200, compatible with IBM's PC/XT hard disk system. The 1200 (and the PC-compatible Model 1000) should appease the many users who want stringent compatibility at the sacrifice of performance.

In addition, IBM introduced the PC/AT (Advanced Technology), a 16-bit machine that runs significantly faster than the PC. This computer uses an Intel 80286 processor clocked at 6MHz, and provides an expandable system that operates in a multi-programming environment with up to 3 megabytes of memory. The AT's 80286 is a close relative of the Tandy 2000's 80186; its identical instruction architecture with added on-board memory management features give the 80286 the advantage in this application.

Unfortunately, IBM chose to operate the processor at a slower speed than the Model 2000, so the AT runs only about 75 percent as fast as the 2000. The bottom line is that the Tandy 2000 is still one of the hottest single-user machines on the market, and a full year after its introduction, its superiority remains unchallenged. That speaks very well for Tandy.

High on ALPS

If you've ever used the Scripsit family of word processors, you'll probably recognize ALPS as the producer of specialized Scripsit printer drivers. ALPS has now branched out into the 16-bit world with a badly



Illustration by Roy Lewando

needed set of utilities for the IBM PC and Tandy 2000.

I've extensively used three of the five ALPS utilities packages listed in Table 1, and I find that they perform exactly as advertised. Each package includes a disk and instruction booklet; the documentation is clear and concise.

The Directory/File/Backup package contains routines that display a sorted multicolumn directory on the screen (DI), find a file located anywhere on a disk in any subdirectory (FINDF), list the directory tree structure of a disk drive or partial directory (DTREE), and back up only modified files (BACKMOD).

The DI utility lets you select any drive or partial directory. It supports wild-card file selection using the familiar MS-DOS wild-card characters. In fact, its parameters are mostly identical to those of MS-DOS's Directory command. You can also use DI to list only modified files or display hidden files.

FINDF and DTREE are exceptional utilities for a hard disk system. FINDF searches a specified disk for all

occurrences of a file name and displays the full path for each file it en-

Lotus' 1-2-3
Tandy/Radio Shack
One Tandy Center
Fort Worth, TX 76102
Catalogue number 26-5300
\$495

Microsoft's Multiplan
Tandy/Radio Shack
Catalogue number 26-5311
\$195

DFB Directory/File/Backup Package	\$59
User Tool Assortment	\$59
Use Memory as a Superfast Disk	\$49
Attachment of a Serial Printer	\$49
Printer Initialization Program	\$39

ALPS
23 Angus Road
Warren, NJ 07060
201-647-7230

P/C Privacy: Personal/Confidential
MCTel Inc., Dept. P/C-1
3 Bala Plaza E.
Bala Cynwyd, PA 19004
215-668-0983
\$140

Table 1. Product information.

counters. DTREE displays the directories' hierarchies on the disk you specify. Indentations in the display clearly show the nested directories' relationships.

If you've ever had the unpleasant task of backing up a 10-megabyte hard disk, you'll love BACKMOD. It saves time by backing up only updated files. MS-DOS maintains an attribute bit that indicates whether you've updated a file; BACKMOD checks the attribute bit and moves only files you've updated since the last back-up.

The second package, User Tool Assortment, provides four useful routines that define a command as one key (KB), count the files in a file (LINECNT), dump files in hexadecimal and character format (HEXDUMP), and change a file's attributes (CHMOD).

The KB command lets you redefine any key as a character string; it can be a simple string or a complex set of commands. You can also inhibit keys so the computer doesn't respond to them.

*If you've ever had
the unpleasant task
of backing up a
10-megabyte hard disk,
you'll love BACKMOD.*

LINECNT counts the number of lines in a text file. You must terminate lines with the standard MS-DOS end-of-line sequence (0DH, 0AH) or the utility won't recognize them. HEXDUMP displays a file's hexadecimal and ASCII character contents on the screen in 256-byte "pages." You can page through the file in either direction.

The last program in this package, lets you change a file's attributes. These attributes are pieces of information that MS-DOS maintains about

each file stored on disk: the operator or the DOS can mark files as hidden, system, read-only, or archived files.

You can designate files as hidden; they're excluded from normal directory searches and won't appear as part of the directory. System files, such as IO.SYS and MSDOS.SYS, carry the system attribute and don't show up in normal directory searches, either. You can assign any file the read-only attribute, which prohibits attempts to open the file to write to or kill it. The archive attribute indicates when you've updated a file; the DOS automatically sets it whenever you properly close a file after writing to it.

The CHMOD utility lets you easily manipulate these file attributes. You can set or reset each attribute to get the configuration you want. You can use this feature with BACKMOD to mark files you want copied in a backup operation.

The last ALPS package I tried was RAMDISK, which lets you speed up an application by using some of the installed random-access memory as a

NEW And IMPROVED CP/M-68K

Treat your TRS-80 Model-16 or Enhanced Model-II or -12 to our new Version 1.2 CP/M-68K, now with:

- **Keyboard Typeahead**
- **C compiler with standard and IEEE floating point**
- **Overlay loader**
- **New utilities**
- **68000 assembler**

Option languages* — CBASIC-68K, PASCAL MT+, FORTRAN-77, PASCAL-68K, BASIC-68K

Version 1.1 users; order a language and receive your version 1.2 upgrade FREE. Upgrade alone only \$25.

Trisoft

4102 Avenue G
Austin, Texas 78751
(512) 453-2233

*Requires 256 kbytes minimum except for BASIC-68K.



high-speed disk. You can load programs or data to the RAM "disk" for later retrieval or use; you'll realize a significant increase in execution speed.

RAMDISK is flexible and self-loading. You install the appropriate command in your configuration file (CONFIG.SYS), and the RAM disk is automatically in place when you reset the computer. You can add disk size in 1K increments up to the maximum amount of free memory available. However, you must remember the overall requirements of the software you're using. In general, 256K is the smallest practical memory size; I recommend 512K.

An example will help illustrate this program's usefulness. On a 256K Model 2000, I allocated a 128K RAM disk and copied all of the Multiplan files to it. If I load Multiplan from the floppy disks, it takes about seven seconds from the time I press the enter key until the program displays its command menu. I was unable to time loading from the RAM disk: The command menu was on the screen before I could remove my finger from the enter key. A rough estimate of the loading time is 0.4 second.

I've found that the 2000's biggest limitation is its lack of good utilities. Therefore, I heartily recommend these packages. I've found many uses for them and have enjoyed experimenting with them. Well done, ALPS.

Anadex 9620A Silent Scribe

Epson FX80, single-density mode
Epson FX80, double-density mode
Epson FX80, triple-density mode
Epson FX80, quad-density mode
Hewlett-Packard 7470A Plotter
IBM Graphics Printer, single-density mode
IBM Graphics Printer, double-density mode
IBM Graphics Printer, triple-density mode
IBM Graphics Printer, quad-density mode
Epson MX80 or MX100, single-density mode
Epson MX80 or MX100, double-density mode
Epson MX80 or MX100, triple-density mode
NEC 8023
Okidata 82A or 83A
Okidata 93, 92, or 84
Prism 80 or 132, single-density mode
Prism 80 or 132, double-density mode
Strobe 100 Plotter
Sweet P Plotter

Table 2. Graphics printers supported by the IBM PC version of Lotus' 1-2-3.

1-2-3 Printer Support

It doesn't speak as well for Tandy that it has resolutely produced hardware and software packages that support only Tandy peripherals. For example, the Tandy 2000's Basic input/output system (BIOS) code intercepts line-feed characters, making non-Tandy printers overprint each line.

Lotus' 1-2-3 for the 2000 suffers from a similar problem. Its Print-Graph configuration supports only those graphics dot-matrix printers that Tandy supports. Also, there's no support program that lets you configure a nonstandard printer.

If you've seen the number of printer configurations the IBM PC version of 1-2-3 supports (see Table 2), you'll be as surprised as I am at the Tandy version's omissions. However, if you have access to the IBM version, you can easily transfer these printer support files by copying the file called LOTUS.DLB from the IBM Print-Graph disk to your Model 2000 disk.

Generally, 1-2-3's Tandy and IBM versions can share software modules. Apart from the printer support files mentioned above and the DOSes, the only difference is the files containing the drivers (KB.DRV, PR.DRV, GD.DRV, and TD.DRV).

Security or Lack Thereof

One of MS-DOS's most serious drawbacks is its close relationship to CP/M, which means many of CP/M's limitations have proliferated throughout the computer industry. For many MS-DOS users, the worst of these limitations is the total lack of a file security system. Even TRSDOS 1.X for the Model I provided a workable password system to limit file access.

Because of this omission, many software publishers have implemented their own security systems. A prime example is the file encryption command of Microsoft's Basic interpreter (SAVEfilename,P). Now, MCTel is marketing a sophisticated file security program called P/C Privacy: Personal/Confidential. PC Privacy contains two easy-to-use routines that allow full encryption and decryption using a key of up to 100 characters. You can use any character, letter, or number in the key; the program ignores blanks.

You can encrypt any type of text or data file.

The longer the key you select and the shorter the file, the harder it is to decipher the text using decoding techniques. MCTel says that over 21 million combinations are available from a key only four characters long.

PC Privacy marks the boundaries of encrypted text with a header and a footer. This means you can encrypt a file for insertion into another document and later decrypt only the coded portion of the document. The program handles text rapidly and efficiently and has neat bells and whistles. I highly recommend this product to those who need increased file security. ■

John B. Harrell III is an associate editor of 80 Micro. You can write to him c/o this column, 80 Micro, 80 Pine St., Peterborough, NH 03458.

LARGE CAPACITY ACCOUNTING PROGRAMS

FOR TRS-80 1, 3, 4 & 4P, LNW, LOBO

★ NEED JUST 2 DRIVES ★
FOR CAPACITY BELOW

ACCTS RECEIVABLE \$150.00

5000+ ACCOUNTS 15000+ TRANSACTIONS
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
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+ TRANSACTIONS/MONTH
- BEST LOOKING FINANCIAL STATEMENTS
- DEPARTMENTAL P & L (UP TO 9)
- STATEMENT OF CHANGES
- SUB-TOTALS WHERE YOU WANT
- FAST FLEXIBLE POSTING INPUT
- PERCENTAGE P & L

DEMO AVAILABLE \$20.00 EACH
APPLIES TOWARDS PURCHASE

COMBINATION SPECIALS

★ 1 A/R & G/L FOR \$200.00
★ 2 A/R, A/P & G/L FOR \$225.00
HARD DISK VERSION SLIGHTLY MORE

VISA H.D.P. MC
2366 Lincoln, Oroville, CA 95965
916 533 5942
MON-FRI 9AM TO 2PM
ADD 3.00 S & H ADD 3.00 COD

**NEW!
IN STOCK!!**

\$777

5 MEG HARD DRIVE

BEWARE!!



Would you buy from this
hard drive specialist?

NO WAITING!!!

\$10 handling & shipping

Comes complete with cable
and your choice of
software driver * (CP/M, LDOS, TRSDOS)

10 Megabyte Hard Drive	\$995
15 Megabyte Hard Drive	1195
30 Megabyte Hard Drive	1495

SYSTEM FEATURES

- For TRS-80 Model 3-4-4P
- Size Rated After Format
- Error Checking & Correcting

*Model 3 requires LDOS

Model 4 requires TRSDOS 6.2 or Montezuma Micro CP/M 2.2

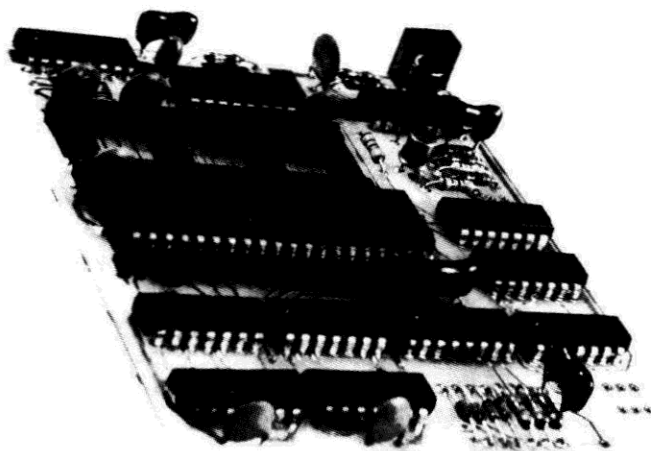
Seriously folks, there are firms that offer benefits or products seemingly too good to be true. There's no reason to expose yourself to possible unhappiness. Aerocomp has proven record of thousands of satisfied TRS-80® customers. Look at the back issues of this magazine. You won't find many companies 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 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 stock. Guaranteed for one year parts and labor. You can count on us to be here if you need us. As always, your satisfaction is assured with our 14 day free trial offer. How can you wrong? Specify the software driver of your choice and start enjoying your computer's real capability. Do it today!

See opposite page ▶▶▶▶▶

"DDC"

Double Density Controller

**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 1 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 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 1 was meant to be a low-cost computer for the masses. Therefore, no double density.

The Facts

Other companies introduced double density controllers for the Model 1 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 1 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 have been proved groundless by thousands of satisfied users the world over. The bottom line here is state-of-the-art performance and reliability.

ORDER YOURS TODAY

TRS-80 Model 1 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.

"DDC" by itself.....\$99

"DDC" and LDOS159

"DDC" and NEWDOS 80 v2.0189

Please add \$4 handling & shipping

DISK DRIVES

- ☞ 40 Track
- ☞ 80 Track
- ☞ Single Head
- ☞ Dual Head
- ☞ Bare
- ☞ Complete
- ☞ Full Size
- ☞ Half Size
- ☞ 5-1/4" or 8"

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 white enclosure.

40tk Single Side full size (TM100-1).....	\$ 169
40tk Double Side full size (TM100-2).....	209
80tk DS full size (TM101-4).....	299
1-40tk SS half-high FD-55A in dual case.....	179
2-40tk SS half-high FD-55A's in dual case.....	319
1-40tk DS half-high FD-55B in dual case.....	219
2-40tk DS half-high FD-55B's in dual case.....	399
1-80tk DS half-high FD-55F in dual case.....	249
2-80tk DS half-high FD-55F's in dual case.....	449

These 8" Thinline drives work with the Model 2 and 12 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. Add \$12 shipping and handling.

1-8" SS Tandon TM848-1E & case.....	\$ 389
2-8" SS Tandon TM848-1E's & case.....	649
1-8" DS Tandon TM848-1E & case.....	499
2-8" DS Tandon TM848-2E's & case.....	799

BARE DRIVES Add \$4 S&H

These drives are completely burned-in and tested for your ultimate satisfaction. Add that extra drive today! Please add \$5 for shipping and handling for each drive ordered.

40tk SS full size Tandon TM100-1.....	\$ 129
40tk DS full size Tandon TM100-2.....	169
40tk SS half high TEAC FD55-A.....	129
40tk DS half high TEAC FD55-B.....	169
80tk DS full size Tandon TM101-4.....	239
80tk DS half high TEAC FD55-F.....	239
8" SS half high Tandon TM848-1E.....	290
8" DS half high Tandon TM848-2E.....	360

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.

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 RFI 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 Tandon drives (TM100-1) or just order the basic kit and pick the drives you want from the selection in the next column.

CONTROLLER KIT.....	\$ 199
(Complete - Everything you need - less drives)	
1 DRIVE SYSTEM.....	319
2 DRIVE SYSTEM.....	449
CONTROLLER ONLY.....	110
MOUNTING KIT & POWER SUPPLY.....	95
RS-232 BOARD.....	69

MISCELLANEOUS GOODIES \$2 S&H

Model 1 TRSDOS 2.3 disk & manual.....	\$ 25
Model III TRSDOS 1.3 disk & manual.....	25
LDOS (specify Model I or III).....	69
NEWDOS 80 v2.0 (specify Model I or III).....	119
10 disks in smoke lib box, Lifetime Guar.....	16
5.25" drive power supply & enclosure.....	59
8" drive power supply, encl. & fan, 5V-24V.....	150
5.25" 2-drive cable.....	24
5.25" 4-drive cable.....	34
5.25" Extender cable with gold contacts.....	13

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 only. 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.

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 **\$239**

You can add our renown "DDC" double density controller to either the Radio Shack or the LNW E/I for 80% more storage capacity on your drive. Go ahead, you deserve increased density. See the opposite page for the latest details.

\$99

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, Mastercharge 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. Canadians add \$20 to your orders if over \$500 for customs documentation.

CALL TOLL-FREE

800-527-3582 USA
800-442-1310 TEXAS

For inquiries or information
or to check on or change an order
call 214-339-8324

AEROCOMP
Redbird Airport, Bldg. 8
P.O. Box 24829
Dallas, TX 75224



YES WE DO WINDOWS SO CAN YOU
Windowpad an integrated windowing and note processing utility is ready for your TRS-80 Model I, III, III/4. Windowpad runs along with your application program or stand alone. Just \$21.25 Postpaid. Send Check or Money Order to EN Fleur Corp. 2494 Sun Valley Cir. Silver Spring MD. 20906-350 [MD. Residents Add 5% Tax]

SEND AND RECEIVE MORSE CODE

- TRIPLE SPLIT SCREEN
- SPEED: 1-200 WPM

This 4.5k assembly language program runs on your TRS-80 Model I, III, or 4. The decoded Morse Code is displayed on the screen and may be printed. The keyboard buffer is active while either sending or receiving. The output is either tone or keyed. I/O is via the cassette interface. The program runs from tape or disk (TRSDOS 2.3 or 1.3). Use it "on-the-air" or for code practice. satisfaction guaranteed or your money back
Cassette with booklet only \$19.95 postpaid.

ROGO Computer Products

4752 DeBeers Drive
El Paso, Texas 79924

UNLIMITED PROFIT POTENTIAL
WATCH OUT WALL STREET! Now available on floppy disk for brokers and active traders. The AMAZING computer program -STOCKER!- uses new Moving Window-Spectral algorithm to forecast stock/commodity market **TURNING POINTS**—not mere trend line/moving averages. Affordable! Easy to use!

USED BY STOCK/COMMODITY BROKERS & ACTIVE TRADERS
Perhaps you too are ready for the STOCKER! challenge!

NEW! Your own personal forecast
COMPARE There is just nothing quite like it
-STOCKER!- forecast for the Dow Jones industrial average daily closing, with your current method

IBM PC
APPLE II, III, IIe
TRSDOS MOD II, 4, 5, 12, 16
TANDY 2000
48K MINIMUM

\$299 MASTER/VISA/CHECK
INCLUDES FREE HOUR ON-MODEM SERVICE

ENGINEERING MANAGEMENT CONSULTANT

P.O. Box 312
Farfax, VA 22030
Tel: (703) 425-1296

Does your broker use STOCKER!?

NODVILL DIET PROGRAM
\$69.95

"TAKE A BYTE"
MAINTAIN, LOSE OR GAIN WEIGHT
With the NODVILL DIET PROGRAM "Take a Byte" and a TRS-80 D.D. Disk M I/III/4 or P.C. Compatible.

you can quickly and accurately

- Calculate caloric and nutritive food intake
- Evaluate nutritive value of your diet
- Compare daily diet to individual RDA Chart
- Create personalized daily meals and menus
- Plan varied daily menus based on sound nutrition
- Save records of daily meals and menus for future planning
- Print nutrition charts, food, meal, menu and grocery lists

"Take a Byte" is a Modular BASIC Program

MAIN Program Menu

- (1) Recommended Daily Dietary Allowance (RDA) CHART
- (2) 733 Expandable Random Access FOOD LIST Data File
- (3) 28 Nutritional MEAL LIST Data File Examples
- (4) 7 Balanced DAILY MENU LIST Data File Examples
- (5) GROCERY LIST Program Module
- (6) 25 Page USER'S MANUAL including Charts and Tables

All Data Files can be EXPANDED and MODIFIED systematically and flexibly to reflect your personal diet, your choice of food items, or your doctor's suggested diet.

For more information, Call (203) 431-6449

To Order: Mail a check or money order for \$69.95 plus \$3.00 (S & H) to:

NODVILL Software
24 Nod Road
Ridgfield, Conn. 06877

ELEPHANT™ Diskettes
LIFETIME WARRANTY

Box of ten 5 1/4" ELEPHANT™ diskettes, with labels, envelopes and reinforced hub-rings

SS/SD \$14.50
SS/DD \$16.50
DS/DD \$21.50

EPSON PRINTERS — SALE
Dot Matrix, Bidirectional with Logic Seeking, Paper Feed and Tractor Feed:

RX 80 100 CPS \$239.00
RX 80 F/T 100 CPS \$285.00
RX 100 100 CPS \$469.00
FX 80 160 CPS, 2 K Buffer \$395.00

Shipping and Handling \$3.00 for any size order of diskettes, \$9.00 for printers. C.O.D. orders add \$1.00. We accept credit cards at NO extra charge. Illinois residents please add 7% sales tax.

Call now TOLL FREE 1-800-441-0000
N. America 1-800-336-6874
Illinois 1-800-912-5400
International 1-313-756-1556

SMART DATA INC.
P.O. Box 297
Winnetka, IL 60091
(312) 256-4456

Subscription Problem?

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.

wabash®

When it comes to Flexible Disks, nobody does it better than Wabash.

MasterCard, Visa Accepted.
Call Free: (800) 235-4137

PACIFIC EXCHANGES
100 Foothill Blvd.
San Luis Obispo, CA 93401 (In Cal. call (805) 543-1037.)

ANNOUNCING

THE GREATEST ROLE-PLAYING FANTASY ADVENTURE EVER WRITTEN FOR THE TRS-80

This game is for the strategy buff as well as the hack and slash player ages 12 and up

FEATURES:

- High speed, 3-D graphics
- Parties of up to 8 characters
- Characteristic traits from 12 professions
- Hand-to-hand combat
- Rich 3-D weapon saving
- 3 classes of magic
- Automatic game saving
- Backup and recovery utilities
- Menu driven operation
- Excellent documentation
- Newsletter for registered owners

WILL RUN ON:

MODEL I (48K): TRSDOS, NEWDOS80, DOSPLUS
MODEL III (48K): NEWDOS80, DOSPLUS
MODEL IV (in III mode)
2 drives for generation
1 drive for play
(C:64 version available - 141541 drive)

PRICE: \$39.95 U.S. (\$49.95 CAN.)
CHECK OR MONEY ORDER payable to 408614 Ontario Ltd.
allow 2 weeks delivery for money order or certified cheque
6 weeks for personal cheques
DEALER INQUIRIES WELCOME

MAIL ORDERS TO:
WARRIORS AND WARLOCKS
56 ECCLESTON DR., SUITE 311
TORONTO, ONT., CAN.
M4A 1K9
(416) 759-8849

NEW! "Where is that Movie?"
Find it quickly, easily with

VIDEO TAPE TRACKER

Takes the work out of managing your video library: easy to use • stores over 1,000 titles • prints numbered labels • lists by tape and/or title • searches by tape, title, or performer • very fast • ready to use

TRACKER is a real time saver, and the price is right. Make your life easier, order today, toll free

(800) 824-7888
oper. 422
PLEASE SPECIFY:
IBM PC 54K 1 disk
TRS-80 I or III
48K, 2 disks
Tandy 2000

PROSON®
Dept. Box 560
No. Hollywood, CA 91603
(818) 764-3131

ALL THIS FOR ONLY: \$39.95

TERMS: VISA MC checks, COD. Please add \$2.00 shipping in U.S. or Canada \$5.00 overseas. Sales tax in Ca. Most orders filled within 48 hrs.

Continued from p. 40

Type in the starting check number and each transaction comes up on the screen so you can verify that you want to cancel it.

You enable Checkbook's printer function from the main menu. If you prefer on-screen reports, set the printer off. The available printouts are the month's checkbook listing, outstanding transactions, and checks listed by account (category).

While the printouts are complete, they're hard to read for two reasons: the extra-long comments and the transactions you've divided among accounts. To reduce the confusion, you can avoid using extra-long comments. But the multiple-account transactions are almost a necessity. Any time these appear in the printouts, Checkbook Plus draws a double line and enters a total in the check amount column. It isn't clear just how much of the column Checkbook is totaling.

Drawbacks

The program operates slowly when moving from the main menu to many of the functions. It took 45 seconds to go to the Category routine, and 41 seconds to go to the Add Transactions section when moving from a different part of the program. Once you're in the desired section, Checkbook's operating speed is reasonable. I improved the speed a little by moving the programs from TDOS to the full implementation of DOSPLUS. This

shaved about 10 seconds from the load times.

Checkbook Plus has disabled the automatic repeat on the Model III keys, a nuisance when you use the left-arrow key to erase errors. Most program modules will accept lowercase command entry, but not all. Starting a new data disk involved backing up the old one, then killing all the data files on the disk so you could reuse the old disk.

Several years ago I reviewed Maxi Cras, a checkbook program in this price range still available for the TRS-80 (80 Micro, July 1982, p. 330). I've used Maxi Cras since writing that review and some comparisons might be helpful.

Unlike Checkbook Plus, Maxi Cras doesn't allow editing or deleting transactions once you've verified them. While this is supposed to be good accounting practice, I find it annoying. I like the ability to fix my errors with Checkbook Plus.

Checkbook Plus also offers a search and sort, something Maxi Cras lacks, although I normally don't use this part of the program. If I need to look for an old transaction, I usually do it on the printouts.

Making back-up copies with Checkbook Plus requires only one disk (the data disk), while Maxi Cras requires that you copy both the data and program disks. Checkbook allows more than one check register on a disk, while Maxi Cras requires a separate set

of disks for each register.

Checkbook provides automatic check numbering on-screen and automatic payment to regular accounts. While I personally don't have any need for automatic payments, I like the fact that Checkbook Plus automatically numbers the checks. Checkbook also automatically saves data as you enter it, reducing the chances of losing anything.

While these advances are considerable, I found Checkbook Plus deficient in two areas where Maxi Cras fared much better. The first is speed; Maxi Cras is much faster and it loads each module quickly.

The other area is the multiple account transactions. Maxi Cras makes the distribution of one check among several accounts simple. You enter the check total, then specify the account numbers and the amount applicable to each. As you work, Maxi Cras displays the remaining amount on the screen, making it easy to dump the last bit to "Miscellaneous," if desired, without your having to resort to a calculator. You can even apportion check amounts by specifying a percentage of the entire check to various accounts and letting the program calculate the correct amounts.

Checkbook Plus is written in Basic. The manual suggests that you could improve execution speed if you compiled the program, but H&C Electronics wants to keep it in Basic so that users can modify the program. Per-



Happy! YES, AND YOU CAN BE TOO. He is moving to the NEW...

TRS → IBM AT
APPLE → IBM PC/XT, Jr.
CP/M → or
Tandy 2000
DISK TRANSPORTER IBM PC ↔ Tandy 2000

They are all moving Important Data **FILES & PROGRAMS** to their new computers. The **FILE TRANSFER PROGRAM** (FTP) has conversion utilities and a small adapter for direct connection. **CALL US.** Our FTP can make you happy too.

IBM AT VERSION (WITH SPECIAL CABLE) \$224.95
FTP IBM PC/XT OR T2000 \$129.95
STATE COMPUTER MODELS WHEN ORDERING CA RESIDENTS 6.5% \$3.00 S&H

**PERSONAL
COMPUTER
PRODUCTS**

1400 COLEMAN AVE., SUITE C-18 SANTA CLARA, CA 95050
TELEPHONE (408) 988-0164 PHONE ORDERS



IBM TRS 80 & TANDY, APPLE, CP/M ARE RESPECTIVELY REGISTERED TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES CORP., TANDY CORPORATION, APPLE COMPUTER INC., DIGITAL RESEARCH INC.

haps the best solution would be to offer both compiled and Basic versions on the same disk so those who prefer the increase in speed can use the compiled version. ■

DISnDATa Thinks Twice

by Terry Kepner

DISnDATa is an intelligent Model I/III/4 disassembler that deciphers programs and recognizes which parts are data items and which are instructions. DISnDATa scans your program and finds all the program messages and directions intended for display and disassembles them as such, instead of blindly translating all the machine-code data as mnemonic instructions.

If you've ever disassembled a machine-language program, you'll immediately understand the value of a disassembler that can differentiate between machine instructions and simple screen messages or data. Most standard disassemblers interpret the messages as load instructions with address specifications and disassemble them.

DISnDATa's most obvious advantage is that when you reassemble the program to a new location, DISnDATa won't alter the messages and data in the mistaken impression that it should change their target addresses.

DISnDATa



Pro/Am Software
220 Cardigan Road
Canterville, OH 45459
513-435-4480
Models I, III, and 4
16K RAM
Cassette (Models I and III)
or one disk drive
\$39.95

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

Instead, DISnDATa simply relocates such code.

A second advantage is that DISnDATa saves you hours of time trying to find those messages and decipher the data. The finished DISnDATa disassembly is almost as easy to read as the original source code, and that's before you even begin tracing program flow and adding comments and explanations. After seeing a DISnDATa disassembly, I wouldn't go

back to a standard disassembler for any reason. Of course, if you need a simple disassembly, DISnDATa will do that for you as well.

Tracing the Flow

Using DISnDATa is easy. You just load the program in memory, relocate it so it doesn't interfere with your target program, load the target program, and disassemble it. DISnDATa works by taking the entry address of your program and actually tracing its logic flow, following calls, jumps, and other transfer-of-control instructions until it's disassembled the entire program. DISnDATa considers anything not pointed at by a jump or a call instruction data and so disassembles it. You can send the finished output to tape, disk, the video, or a printer (the disk disassembly uses either Apparat or Radio Shack's EDTASM I format; tape uses Radio Shack's EDTASM I tape format).

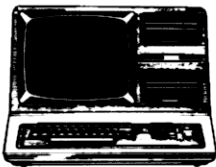
While the disassembler logic sounds simple, it's actually quite complex. DISnDATa must not only decide which program sections are data, but how it should disassemble that data (as DEFW, DEFB, DEFS, DEFM, or EQU) so you can read it with a standard editor/assembler.

Disadvantages

DISnDATa does have a few disadvantages, but these are related to the TRS-80 disk operating systems. For instance, it would be convenient for

TRS-80* SOFTWARE

Write for our incredible catalogue of over 130 pages, containing hundreds of programs for the Model I, III, 4, and Colour Computer. Catalogue is \$5.00 refundable on your first order. All software is unconditionally guaranteed for life! Canadian manufacturer and distributor for Molimex Ltd. of England.



*Trademark of Tandy Corporation.

GAMES/DOS/UTILITIES/BUSINESS PROGRAMS

LDOS	\$ 99.95	ENIGMA (Game)	\$ 25.95
MULTIDOS	\$129.95	TYPEITALL (Word Processor)	\$ 99.95
ACCEL 4 (Basic Compiler)	\$ 97.95	DC-10 (Flight Simulator)	\$ 25.95
JUMBO (Flight Simulator)	\$ 26.95	EDAS (Editor/Assembler)	\$129.95
POWERMAIL PLUS	\$199.95	HARTFORTH	\$ 99.95
AIRBUS (Flight Simulator)	\$ 29.95	PASCAL	\$132.95
DRIVER COMPILER	\$ 29.95	DSMBL 3 (Disassembler)	\$ 54.95

FULLY SUPPORTED COMPUTER SOFTWARE

THIS MONTH'S SPECIALS

MYSTERIOUS ADVENTURE SERIES

The Time Machine (Mod. 1, 3, 4 disk/tape)	\$14.95
Escape from Putnam (Mod. 1, 3, 4 disk/tape)	\$14.95
All 10 adventures (Mod. 1, 3, 4 disk/tape)	\$99.95

THESE SPECIALS ARE OVER AT THE END OF THIS MONTH!

JSOFT LTD. ★ 177

P.O. Box 1437, WINNIPEG, Manitoba R3C 2Z4
(204) 943-8916 CANADA DEALERS WELCOME

MOVING? PROBLEM?

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

1-800-645-9559*

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

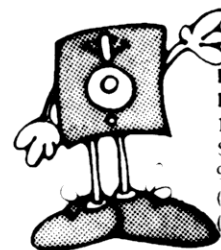
If possible, please have your mailing label in front of you as well as your cancelled check or credit card statement if you are having problems with payment.

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

*New York State residents call
1-800-732-9119.

MEMOREX FLEXIBLE DISCS

WE WILL NOT BE UNDER-SOLD! Call Free (800)235-4137 for prices and information. Dealer inquiries invited and C.O.D.'s accepted.



PACIFIC EXCHANGES
100 Foothill Blvd
San Luis Obispo, CA
93401 In Cal call
(800)592-5935 or
(805)543-1037

✓ 207

REVIEWS

DISnDATA to warn you when a target program is about to overwrite it. And it would be helpful for DISnDATA to display the starting and ending addresses of the target program as well as the entry point address when DISnDATA loads it.

The problem is that different DOS-es use their own methods to indicate the starting and ending locations of programs on disk, and each uses its own method for disk loading. Rather than limit you to a particular DOS and hardware arrangement, DISnDATA takes the file name you give it and turns it over to the DOS. The DOS takes care of finding and loading the program and, when done, returns control back to DISnDATA (in fact, error messages during disk I/O are DOS messages, not DISnDATA error messages).

Consequently, DISnDATA has no idea where or how the program loads. All it knows is the entry point address the DOS leaves on the CPU stack. Both complaints are actually trade-offs in compatibility. While Pro/AM Software could've added the code necessary for each DOS to return the start and end addresses, DISnDATA would've been much larger, restricting its use to smaller programs.

Fortunately, you can look at the directory entry for a program and thereby determine its size. Since most programs start with their entry point, you shouldn't have too many problems using those crude approximations as

starting and ending values. If it's really necessary, you can use a machine-language monitor to load the program to find out the addresses. Tape programs don't have this problem, since there is a standard tape format. For tape programs, DISnDATA tells you the start, end, and entry point addresses.

As mentioned earlier, you can relocate DISnDATA anywhere in RAM, but you must remember two rules. First, DISnDATA uses 100 bytes above the program for disk output (you can ignore this for tape, video, or printer disassemblies). Second, the stack DISnDATA uses to trace program flow during disassembly starts at the bottom of DISnDATA and grows downward in memory until DISnDATA finishes the disassembly, reaches the target program, or runs out of RAM. As a result, you might have problems with extremely large or complex programs, which is why DISnDATA's size is important.

Using an entry point to trace program flow presents one problem: The disassembler can't handle computed transfer-of-control instructions. Since DISnDATA traces the program instead of executing it, it doesn't know what computations the program is making and how those affect the finished disassembly.

DISnDATA can't correctly disassemble programs that modify themselves by computing an address and putting that address into a location in-

side the program (rather than in a data location outside the program) the first time.

Disassembling these types of programs requires a little detective work on your part. You need to disassemble them with both methods, straight and intelligent. By comparing the two disassemblies, you should be able to quickly spot those areas of computed transfer-of-control.

Armed with these addresses, you have to re-disassemble the target program, giving DISnDATA all the transfer-of-control addresses as well as the entry point addresses.

Your finished disassembly should be perfect. DISnDATA will properly decode all the instructions, and properly label all the messages. You'll have to repeat this several times, but compared to working with a standard disassembler, it's not that much trouble.

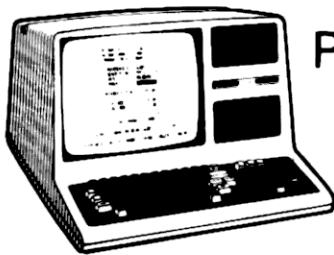
Conclusion

Currently, DISnDATA is available in two versions, one for the Models I and III, and one for the Model 4. But because of ROM-code jumps DISnDATA uses, you can't use it on Lobo Max-80 or LNW-80 computers. On the other hand, because it doesn't use its own disk I/O routines, you can use it with hard disks and other special hardware arrangements.

If you need a machine-language disassembler, DISnDATA can save you lots of time and hard work. Its advantages far outweigh its minor difficulties. ■

TRS 80 COMPUTERS

**New Computers • Full Line of 100% Radio Shack Products
Manufacturers Warranty • Unbeatable Prices**



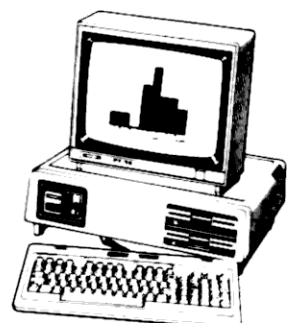
64K
Model 4
By Radio Shack

Please Call for Current Prices

Computer Specialist Available for Assistance.

**NEW LOW
PRICES!**

128K TRS-80
Model 2000
By Tandy



TALLEY COMMUNICATIONS CO.

P.O. BOX 193 • 121 N. STATE STREET
DECATUR, TEXAS 76234 • (817) 627-1017

VISA • MASTERCARD • CASHIER'S CHECK • MONEY ORDER • C.O.D. WITH 25% ADVANCE

**References Available.
Fast Delivery.**

347

80 LIST OF ADVERTISERS

Reader Service Number	Page	Reader Service Number	Page	Reader Service Number	Page
82	Aerocomp 122,123	134	Elek-Tec 55	127	Noteworthy Software 131
166	A & J Micro Drive 101	350	En Fleur Corp. 124	36	Omnisoft Research 87
215	Alcor 95	172	Engineering Management Consultants 124	201	Optimal Tech. Inc. 143
136	Allen Gelder Systems 70	214	Fort Worth Computers 39	151	Orion Instruments 81
140	Allied Systems 117	214	Fort Worth Computers 61	207	Pacific Exchanges 60
476	Alpha Bit Communications 97	496	Good Software 137	207	Pacific Exchanges .. 124, 126
17	Alpha Products 14, 15, 17	103	Good Software 139	124	Perry Computers 79
374	ALPS 61	185	Gooth Software 41	143	Perry Computers 118
141	Anitek 23	455	Hard Drive Specialists 80	176	Personal Computers 125
400	Anthropomorphic Systems 117	61	Harmon Hardware & Supply 133	290	Pickles & Trout 109
170	APCA 39	355	HDP 121	366	Pico 117
390	Applied Microsystem 28	9	H & E Computeronics ... C IV	306	Powersoft 33
102	Armstrong Genealogical 130	9	H & E Computeronics 25, 77	260	Pro/Am Software 47
383	Astro-Star Enterprises 132	175	Howe Software 34	76	Producer, The 20
152	BC Compco 83	46	Hypersoft 135	449	Professor Jones/Frogg House 54
186	Blue Ridge Software 81	425	Indiana Software Dev. Co. 81	174	Professional Tax Software 72
164	BMC Computers 83	148	Intelligent Technologies Corp. 134	248	Programmers & Assoc. 129
381	Bodex 97	534	Jameco Electronics 41	8	Prosoft 55
256	Borg Industries 53	101	J & M Systems 110	1&2	Prosoft 4
300	B.T. Enterprises 135	126	JMG Software International 31	51	Prosoft 124
299	C.B. Microdex 102	229	JRM Publications 131	91	Prosoft 9
86	Compulogic 134	171	J SOFT 126	30	Prosoft 10
365	Compusoft Publishing 140	331	KSOFT 39	30	Prosoft 11
165	Computer Novelty 132	485	Kalglo Electronics 142	194	Quant Systems 139
18	Computer Plus 73	462	Langley-St. Clair 61	75	Radio Shack/Tandy CII, 1
223	Crest Software 53	115	Lynn Computer Service 100	265	Ridge-Tec Inc. 134
539	Desert Sound 102	112	Joe Lynn Computing 113	512	Rockware Data Corp. 33
27	Design Software 72	218	Magnetics 97	343	Rogo Computer Products 124
282	DFW Computer Center 129	250	Marymac 129	368	Safeware 142
282	DFW Computer Center 53	111	McSystems 133	252	Smart Data Inc. 124
367	Digital Images 60	*	Micro Data Supplies 89, 90, 91, 92	192	Software Concepts 135
204	Discount Data 67	464	Micro Labs 141	*	Software Support 26, 27
*	Diskette Connection 143	526	Micro Software Systems 13	444	Southwestern Digital 115
62	Displayed Video 105	137	Miller Microcomputing 111	213	Standard Software 138
216	EAP Company 88	107	Misosys Inc. 30	71	Sublogic Communications 86
125	EC Data/Tempra International 101	411	Montezuma Micro 3, 4	456	Sunlock Systems 81
178	EZWare Corp. 95	416	Montezuma Micro 74, 75	285	Sun Research 107
85	Educational Micro Systems 41	*	New Classic 71	189	Tab Sales 138
	80 Micro	281	Nibblenotch 101	347	Talley Communications 127
	Back Issues 83	232	Nocona Electronics 58	266	T/Maker CIII
	Load 80 64	54	Nodvill Software 124	81	Total Access 7
	Mailing List 134	95	Northwest Computer Algorithms 47	227	Trisoft 120
	Subscription Ad 32			32	TVG Systems 95
	Subscription Problems 124			*	Vespa Computers 103
	Toll Free Number 126			41	Warriors & Warlocks 124
45	Electric Webster 85			123	Wilson Technical 130
				279	Zygotron 60

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

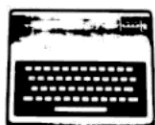
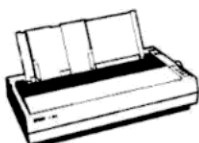
MARYMAC INDUSTRIES INC.

800-231-3680

Radio Shack TRS-80's

EPSON PRINTERS

People you Trust to give you the very best!



- Lowest Price
- Reliable Service
- Quality Products

22511 Katy Fwy., Katy (Houston) Texas 77450
(713) 392-0747 Telex 774132

✓ 250

XENIX

MULTI-USER SOFTWARE

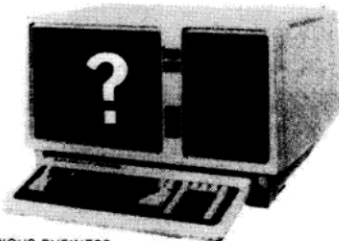
WE HAVE THE ANSWER!
MODEL 16 TRS-80 ACCOUNTING

ALSO AVAILABLE AS
SINGLE-USER FOR
THE MODEL II & 12

NEED SOMETHING
SPECIAL?

CALL US!

BUSINESS ANSWERS FOR SERIOUS BUSINESS
THE PROGRAMMER & ASSOCIATES
YOUR COMPUTER PROFESSIONALS!



- | | |
|-----------------------|--------------------|
| • ACCOUNTS RECEIVABLE | • ACCOUNTS PAYABLE |
| • GENERAL LEDGER | • PAYROLL |
| • INVENTORY/INVOICING | • JOB COSTING |

\$595 EACH (MODIFICATIONS ARE AVAILABLE)

NEW

MANUFACTURING INVENTORY \$995

THE PROGRAMMER & ASSOCIATES, INC.
10802 FOREST LANE SUITE 110
DALLAS, TEXAS 75243
1-214-341-9874

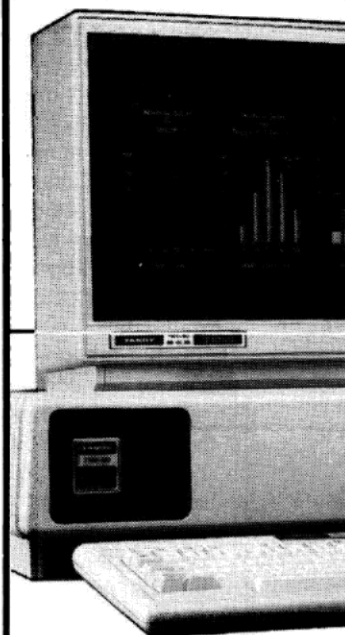
✓ 248

TRS-80®

✓ CHECK OUR PRICES

**ALWAYS AT
SALE PRICES**

WITH MANUFACTURERS
WARRANTY (IN USA).



MODEL 4



MODEL 2000

CALL TOLL FREE
To get YOUR
SALE PRICE-DIAL



**WE SHIP
FAST!**

✓ 282

1-800-433-SALE

(9am - 5pm C.S.T.)

DFW COMPUTER CENTER
326 MAIN ST., GRAPEVINE
TEXAS 76051 (817) 481-7283

VISA

MasterCard

Discover

® REGD: TANDY CORPORATION



MODEL 4-P



MODEL 1200

NEW

LNW SERVICE

QUALITY REPAIRS ON ALL LNW FACTORY ASSEMBLED PRODUCTS INCLUDING:

- TEAM AND ALL LNW80 MODEL COMPUTERS
- SYSTEM EXPANSION II
- LNDOUBLER AND LNDOUBLER 5/8
- LNW DISK DRIVES

COMPUTER UPGRADES:

- CP/M 2.2
- HARDWARE 80 x 24
- MODEL 4 UPGRADE
- TEAM UPGRADE

OTHER PRODUCTS AVAILABLE:

- HARD TO FIND LNW PARTS
- LNW SOFTWARE

Editor Note:

This space open for specials!

WILSON TECHNICAL SERVICE

8:00 AM-5:00PM(PST) AFTER 5:00 PM(PST)
VOICE 714-531-8136 DATA 714-531-8136
300/1200 BAUD

✓ 123

GENEALOGY and INDEXING software

GENSYSTEMS 1.3 (genealogy)

TRS-80® Models I/III/4/4P
TRSDOS® 2.3/1.3
system and user's manual: \$128.45

G-CRAB 5.0 (genealogy)

TRS-80 Models 4/4P or II/12/16
TRSDOS 6.x/ 2.0a/ 4.2
system and user's manual: \$195.00

DEX 1.0 (indexing)

TRS-80 Models 4/4P or II/12/16
TRSDOS 6.x/ 2.0a/ 4.2
system and user's manual: \$99.00

Please send \$2.00 for a descriptive
booklet on GENSYSTEMS or
G-CRAB or DEX.

Texans please include 5.0125% sales
tax.

**ARMSTRONG
GENEALOGICAL SYSTEMS**
5009 Utah Drive
Greenville, TX 75401
(214) 454-8209

✓ 102

REVIEWS

ListKey: The People's Program

by Thomas L. Quindry

List/Key is a data base management system that performs one specific function: It maintains lists of people. You can use List/Key to generate a list of names, addresses, telephone numbers, and other specific information about the people listed. You can configure List/Key for one of three applications: the home, the small business, or professional offices. But I found the program too inflexible for any but the most simple data bases.

List/Key comes with its own operating system. This native DOS prohibits your transferring List/Key to other DOSes by conventional means and serves as a form of copy protection. This protection scheme is the source of many of List/Key's problems because it limits your ability to work with and modify the program. The DOS also generates a couple of machine-crashing bugs.

You can buy a List/Key demonstration disk for \$25 to see if the program's right for your needs, and you can later update the demo disk to the full List/Key program (with the demo cost credited).

Installation

To install List/Key, you follow a one-time menu-driven procedure. First, you need an access code, which comes with your version of the program. Then you answer prompts relating to your data base needs, your name, address, phone number, and company name. You can also specify a password for further protection.

The installation process formats List/Key to your specifications. You first select how many drives you want to use (from one to four). If you use only one drive, List/Key stores data on the same disk with its operating system.

List/Key's data base comes formatted for name, address, and phone number fields, and you can add fields for a title, position, company name, date, special category, and memo. In addition, you can specify titles for the nine category fields. Within certain limits, you can dictate the length of each field.

*List/Key's native DOS
serves as a form of copy
protection, limiting your
ability to modify the
program.*

Once you set up all the fields and field lengths, you then establish printer parameters for print size and any other features.

Using List/Key

Several menus direct you through the program. The main menu offers options to access the data base, print out items in any of three formats, or maintain the list.

In the access option, you can add, edit, delete, or get items in the data base, or use the data base's multilog function. The multilog function lets you selectively retrieve items according to one of nine different sets of parameters (selection logs) you create. For example, one log may retrieve items with last names from A-D. Another may choose items according to a zip code range. You can set logs up to scan through one of the nine special-category fields. You can also customize prompts relating to each log set up using List/Key's on-line help function. (You can also develop your own help messages for any mode of operation.)

List/Key offers a delete function, as well as an undelete function, which restores all deleted items unless you've overwritten them.

The printout mode has four options: to print a formatted list of all information, of names and addresses for a telephone directory, of mailing labels, or of envelope addresses. You can also use the multilog function to selectively print.

The maintenance functions provide for disk back-up, indexing, and changing certain printing parameters. The indexing function sets the default field for ordering your data base. As installed, the data base is ordered alphabetically by last name. But you can order (or index) the data base by any of the other fields.

The index is where your trouble starts. Everything is fine when you set up the index, but the next time you select the maintenance mode, the pro-

gram hangs up. It seems that you can inadvertently overwrite the maintenance program. For instance, while I was verifying another List/Key feature for this review (with a good back-up copy), I mistakenly overwrote the maintenance program after I used the expansion option and the back-up option. Both the List/Key back-up and the original were unusable.

This is an error that only The Soft Place can correct. I'm sure that by now other users have brought it to their attention. I assume that the manufacturers will correct it.

Limited Operation

After you finally get List/Key installed, its use is somewhat limited. Because of the protection scheme The Soft Place chose, you can't get into the protected Basic program to make modifications. You can't even back up the List/Key program before you choose the install options. And once they're invoked, you're stuck with most of them regarding fields and field lengths. If you misjudge your needs, you can't make corrections later; you're at the mercy of The Soft Place.

List/Key lets you use non-zero drives for data disks, with one exception. If you use the program disk for data also, you can't expand to any more drives. The procedure to expand the system is to go into the maintenance mode, select the utility option, and elect to add a drive. According to the manual, the next procedure is to insert an initialized disk into the expansion drive. (You get an initialized disk by using an old back-up copy of the List/Key program disk to make one.) But you can't convert a back-up of the program disk to a data disk for the expansion. Not having more than two drives, I couldn't verify that you could expand from two to four drives.

After you expand to other drives, data disks become drive-specific; you shouldn't put a disk written for one drive in a different one.

The Documentation

The List/Key manual is the same size as a floppy disk (5 1/4 inches square) and contains 172 pages, equivalent to 75 pages of a normal-size manual. It includes an index as well as a table of contents. On-line help messages that appear throughout the program have a handy key indicating

List/Key



The Soft Place
Box 7370
Glendale, CA 91205
818-243-5111
Model III, 48K RAM
One to four disk drives
Printer
\$250

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

page numbers in the manual for more information.

Overprotected

The Soft Place's penchant for software protection has defeated their objective in providing a useful program. The program disk shouldn't be write-protected, since certain operations in the program require updates. The errors I mentioned wouldn't have occurred if the program disk had a tab over the write-protect notch. If I didn't have special tools available to keep my copy of List/Key running, I wouldn't have been able to write this review. A typical user would have to call The Soft Place more than once.

The dependency of this program on the specialized operating system also doesn't allow transportability of data to programs other than those produced by The Soft Place. You can't create special data bases by combining several data disks; you'd have to rekey all the data to another program.

Perhaps the most limiting thing about List/Key is its inability to create more than one type of data base. You can't format one list for home use and another for business.

List/Key prints messages for all errors encountered. The error location is pinpointed and the probable cause given. Judging from the manual, The Soft Place is prepared to provide user support during the warranty period and afterward (for a fee). In my opinion, you'll need it. ■

PLAY CHESS WITH THE MASTERS! INTRODUCING CHESS CLASSICS

Entertaining, educational chess software to improve your chess game. Each disk contains 64 games played by masters from Morphy to Fischer and Karpov. Use CHESS CLASSICS to look at a great game and see if you can guess the winner's move.

Built-in scoring system gives you an approx. US Chess Federation rating for your success in picking the right move.

Available for TRS-80 Model I, III and IV

KING PAWN DISK . . \$59.95

QUEEN PAWN DISK \$59.95

BOTH DISKS \$100.00

(CT Residents add 7 1/2% sales tax)

Send check or money order to:

Noteworthy Software Inc.

12 Noteworthy Dr.,

Danbury, CT 06910

✓127

MUSI-PRINT

Publish Your Own Music!



- * Three print styles with multiple strike option.
- * Simple editing features with full screen view of music.
- * Prints up to 43 consecutively-numbered pages of music.
- * Single line, keyboard, voice and full score formats.
- * All common musical symbols.
- * Range three lines below staff to four lines above.
- * For composers, arrangers, teachers and students.

For complete information, write:

JRM Publications, LTD.

P. O. Box 10065

Greensboro, NC 27404

✓229

Easy to program with your Model I/III/IV,
48K Disk and Epson MX-80 Printer
with Grafrax.



LETTER - WRITER™

"WORKS" for YOU™

\$19.99
DISK SALE

THE "BEST" SOFTWARE IS GUARANTEED!
TRY IT and LIKE IT, or GET a REFUND

The machine code L-W is "A" rated by
Allenbach's "SOFTWARE REPORTS" for:

EASY USE, DOCUMENTATION, FEATURES

- SCREEN DISPLAYED same as PRINTING.
- Use ANY PRINTER * GRAPHICS options.
- FULL PRINTING CONTROLS: Columns, lines, pages, FORM LETTERS/LABELS, LEGAL paper/LINE NUMBERS/MASMAILER.
- FULL TYPING CONTROLS: Copy/Move/Center/Insert/Delete--Characters/Words/Lines/Blocks/Columns/Files.
- *OVER 50 ASCII Code/PHRASE typing insertions set up/stored by users.
- *WARM START and pre-set PAGE SAVE.
- Split screen typing line, see old and new version * cancel changes.
- Unmodified MI see/print lower case.
- INTEGRATED bookkeeping ADD / SUB.
- EASY ARROW KEYS CURSOR moves: Up/Down/Right/Left Start/End-Line/columns/page and WORD WRAP control.
- ONE MODE: Type/Edit/Delete without switching modes--NO TRAINING PERIOD.

WE PAY TAX/USA SHIPPING. Try a L-W for 3 months. Like it or return it for a refund, less our S/H costs of \$3.50.

Models I, III/IV: TAPE 16K \$23.99
DISK 32K (* Extra Features) \$37.99

VERBATIMSS/DD (Box of 10 disks) \$19.99

ASTRO-STAR ENTERPRISES 383
5905 Stone Hill Dr. Information:
Rocklin, CA 95677 (916) 624-3709

Orders: 1-800-622-4070 Ext. AS
in IL 1-800-942-7317 Ext. AS

COMPUTER T-SHIRTS

FOR HOME, SCHOOL, AND OFFICE!



Made in U.S.A.

The ULTIMATE Software!

Command instant attention!

AMUST for all computer lovers!

BRIGHT GREEN (LCD) LETTERS

CUSTOM SILKSCREENED ON 50/50 BLEND

— HIGH TECH DESIGN! —

Five popular styles to choose from

Order Today! Only \$8.95 ppd

Simply select Style and Color below

LET'S SEEK, PEER & PORE (#1) White #1 Pink #2 Blue #3
TAKE A BYTE OUT OF ME (#2) Green #4 Gray #5 Red #6
I'M USER FRIENDLY (#3) Black #7
HAPPINESS IS A PROGRAM THAT WORKS (#4)
I ♥ COMPUTERS (#5) CUT SIZES S-M-L-XL

Please send me

Shirt _____ Size _____ Color _____ Size _____

Use additional sheet if necessary

COMPUTER NOVELTY CORP

P.O. BOX 2064

FREEPORT, TEXAS 77541

Enclose \$8.95 ppd each TX Res 6% tax

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

991

REVIEWS

Fullview Word Processor: Too Little, Too Late

by Alan Neibauer

On the surface, the Fullview Word Processor has everything you'd expect in a full-blown word processor. But once you start using it, Fullview seems to be behind the times compared to the features available with current word processors. A word processing system should be easy to use, perform the editing functions needed, and support the writer in getting the job done as quickly and effortlessly as possible. Unfortunately, Fullview falls short of these requirements. Those who need a serious word processor should buy a more convenient (and probably more expensive) system. And I think casual users can find a more suitable word processor for about the same price as Fullview.

To be fair, Fullview attempts to do everything that a word processor should. It automatically prints a table of contents and numbers document subsections with either Arabic or Roman numerals. It supports a variety of print features, including all the fonts of the Epson series printers (as well as others). And Fullview offers a configuration program to adjust the word processor for almost any printer, either letter-quality or dot-matrix. The system can print form letters and can even stop in mid-printing to request relevant information.

RAMDOS, the operating system supplied with Fullview's editor, loads extremely fast and is TRSDOS-compatible.

The Approach

Fullview uses a two-step approach to word processing, including a text editor and a text formatter. You use Fullview's editor to enter and edit text, and embed special codes within the text to produce the desired final document. For example, embedding ".Bold On" in a document prints the subsequent text in bold face. Fullview's formatter, the second part of the system, structures and prints the text according to the codes. You switch back and forth between the two modes to format and print a document. If you're not satisfied with the results, you have to reload the editor, change the codes,

and switch back to the formatter.

While the editor can print simple text in one step, you use the formatter for more complex operations to access Fullview's other features.

This two-step approach leads to problems. I like seeing the final format of my document on-screen during text entry. If I must memorize a set of commands, I'd rather use them to format the text as I enter it. It's easier to test different formats and detect errors without switching programs.

The Editor

After loading the editor, the cursor sits at mid-screen. You do all editing at this position and the text scrolls up rather than the cursor scrolling down. Since the text scrolls up from mid-screen during entry, you can see only 10 lines on the screen at a time. When you're editing longer documents, the screen fills above and below the mid-point cursor. But I consider a 10-line limitation during entry too limiting.

Fullview can display a ruler showing the locations of margins and tabs. This is a common feature found on almost all serious word processors. However, Fullview's ruler (which you can turn on and off) appears at mid-screen, just above the cursor. As text

Fullview Word Processor



Mitek Systems Inc.

9580 Black Mountain Road

San Diego, CA 92126

619-566-7125

Fullview Text Editor \$49.50

Fullview Text Formatter \$49.50

Models III and 4, 48K RAM

One disk drive

Easy to use? ★ ★ ☆ ☆ ☆

Good docs? ★ ★ ★ ☆ ☆

Bug free? ★ ★ ★ ☆ ☆

Does the job? ★ ★ ★ ☆ ☆

REVIEWS

scrolls, the line above the cursor disappears behind the ruler and you can see it only by turning off the ruler. You can't display the ruler, the cursor line, and the line above them at once.

Fullview doesn't support word wrap-around. You must press the return key at the end of each line, and if you continue typing past the right margin, the screen scrolls by horizontally. You can use the Fill option to adjust the text to fit between the margins. But this is an extra step that you can only invoke after you enter text. It won't engage word wrap-around to format the text automatically.

The editor provides two print commands, one for serial and one for parallel output. While the editor can print a complete simple document, it also prints any codes you've embedded in the text. You have to print documents with these commands through the formatting program. If you forget to use the Fill option, the editor prints long lines across the width of the paper. Evidently the print command from the editor is a simple ASCII file dump to the printer. It has no way to determine what is text, what are the nonprinting commands, or what the margins should be according to the ruler.

The Formatter

Fullview's formatter produces text according to the embedded codes with great speed, displaying the finished document on either the screen or on paper. It doesn't print format codes as the editor does, but it does require a good deal of forethought. For example, the formatter doesn't recognize a carriage return as the desired start of a new line. Unless you embed codes specifically at the start of each new paragraph (or to indicate when blank lines are desired), Fullview formats all text as a single paragraph.

Getting the most out of Fullview requires entering a lot of code while you're in the editor. This makes the editor's print function suitable only for archive copies of raw text.

The usefulness of using so many codes is questionable. The manual displays an example of an outline created with the embedded codes. It's something that you could easily type in using a number of tabs along with the ruler. But using the editor and formatter requires that you first enter six lines

of code, then type four more keystrokes before each single-word entry. The unformatted code doesn't look anything like an outline and would be quite difficult to edit.

Fullview is ostensibly designed for large files. While you can chain any number of individual documents together for formatting and printing, Fullview is memory- (not disk-) based. On a 48K machine, you can't have documents that exceed 20K, so you still have to load and edit longer files individually.

The Manual

The manual is divided into three sections (Overview, Editor, and Formatter) and it appears to have been produced on a dot-matrix printer with a hard-to-read sans serif font. It doesn't provide a tutorial and requires that you do some searching to understand how to use the program. The authors do, however, include a section covering all system functions. But it is written in the pseudo-code of the programming CASE statement. Nonprogrammers unfamiliar with the C or Pascal CASE statement, or the If... Then... Else... Endif format, will find this section confusing.

Extras

The Fullview package contains a reference card and a plastic keyboard overlay of the commands. The card displays pictorials of the different cursors, editor and format commands, and the RAMDOS functions. It was a big help in learning the Fullview system.

The keyboard overlay, however, was unprofessionally done. It was unevenly cut and amateurish. The printing on the plastic was too light to read and it had broken characters. In fact, I had to keep lifting it off the keyboard to read the commands.

Summary

Fullview is certainly a complete word processor that provides most text editing and formatting functions. It's just the execution that's cumbersome. If I were buying a Model I again, Fullview would give Scripsit I a run for its money. But times have changed and, unfortunately, Fullview seems not to have noticed. ■

DISCOUNTS on all TRS-80® COMPUTERS

with
Manufacturers Guarantee

Call or Write For
Free Catalog and Price List

*Trademark of Tandy Corporation

**HARMON
Hdw. & Supply**

307 N. Main
Denver City, Tx 79323
806-592-2472



✓61

Debug Programs Faster!

DPIT (for Debugging Programs by Interpretive Tracing) is a sophisticated tool with which you can explore and debug machine language programs. In the COMMAND mode, it will step through machine language programs one instruction at a time or a block of instructions, showing you the address, hexadecimal value, Zilog mnemonic, referenced registers contents and referenced RAM contents for each instruction. The 8 different COMMAND mode commands include load a program from disk, output to line printer or video display and define up to 15 different trace limits in RAM. The 19 commands in the DEBUG mode include block move, execute a CALL or RST, fill memory, find bytes, jump to address, memory modification in Hex or ASCII and modify flags or registers. **DPIT** includes a comprehensive manual available only on disk.

DPIT \$32.95

ORDERING: Specify Model 1, 3, or 4. Include \$2.50 for postage and handling. Maryland residents add 5% sales tax.

McSystems Software
P.O. Box 44313
Washington, DC 20026-4313

✓111

POWER HUNGRY?

Inside your TRS-80 Model 4 is immense POWER fighting to get out.
SUPERMOD4 frees it!

YOU CAN COMMAND THE POWER

If you own a Model 4, and use a Model 3 DOS,
you can now command a SUPERCOMPUTER.

SUPERMOD4 BRINGS POWER TO YOUR VIDEO with 80x24, 40x24, 64x16 and 32x16 video formats, reverse video, up to 24 line scroll protect and more. And this is total power: all BASIC video control commands (print@, tab, set, reset, point etc.) get the power.

SUPERMOD4 BRINGS POWER TO YOUR KEYBOARD, the power of an audible keyclick for accurate typing, the power of easily programmable special function keys.

SUPERMOD4 BRINGS POWER TO YOUR PRINTER. With its 14K print spooler, you can print while your computer does something else. You can also send unaltered graphics codes to your printer.

SUPERMOD4 BRINGS YOU THE POWER OF SPEED. Using the 4 MHz CPU clock, all your software runs twice as fast — but not out of control. SUPERMOD4 makes the realtime clock and similar operations work correctly.

SUPERMOD4 HAS THE POWER OF INVISIBILITY. SUPERMOD4 is 100% software, but all you see is the power, not the program. SUPERMOD4 uses NO USER MEMORY! All the powers touch not one byte of your memory.

SUPERMOD4 HAS THE POWER OF INTELLIGENCE. It knows how to do its job, it doesn't need any software or hardware patches. All SUPERMOD4 needs is a Model 4 (4P owners, please inquire) running most Model 3 DOS's. It works with all software that use the normal I/O drivers.

You control the POWER: select the ones you want, and have them work your way.

SUPERMOD4 is so powerful, only a few of its abilities have been revealed here.
To learn more, send for details.

What is the price of power? Only \$4995

DISK DRIVE — \$499⁹⁵

Not a normal disk drive - but better! (And it doesn't even need diskettes!)

- SUPERDISK is a software RAMDISK for NEWDOS/80 2.x on the TRS-80 Models 1,3 and 4.
- SUPERDISK allows extra memory to be used as a disk drive.
- SUPERDISK is 1000%-2000% faster than a normal drive.
- SUPERDISK works with all disk commands: format, copy, pdrive etc.
- SUPERDISK provides up to 106K of storage on a 128K Model 4 (less on 48K and 64K machines).
- SUPERDISK can be the system drive. No need to keep a disk in drive 0.
- SUPERDISK is compatible with Alpha Technology's memory boards. With them, create even larger RAMDISKS.

Also available: Hardware by Alpha Technology - 5 MHz CPU speed-up kits and memory expansion boards (up to 512K). Both are compatible with SUPERMOD4 and SUPERDISK. Send for details.



Intelligent Technologies Co.
Finding the software answer to the hardware problem.

21 Campbell Drive • Dix Hills, New York 11746 • (516) 462-6970 Ext. 8 ✓ 148

Terms: checks, money orders or C.O.D. • free shipping in cont. US (C.O.D. extra) • NYS. res. add sales tax • foreign cust. inquire rates

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



4831 SOUTH HAMPTON RD. LB41
DALLAS, TEXAS 75232
814/350-1332 ✓ 86

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)

back-track

The Super User Friendly Disk Utility
For TRS-80* Models I, III and 4^{III}

- Duplicate Most Protected Disks
- Edit (Zap) Sectors
- Powerful Disk Formatter

menu driven with help command for the novice
short cuts for the experienced user
self booting, does not require DOS
simultaneous Hex and ASCII display
reads SD, DD or Mixed Density with auto density detect
reads single or double sided, 5 1/4" or 8" disks

YOU CAN NOW

Read, edit, write and step through sectors
and tracks (including information between sectors)
Duplicate most CP/M** disks for other P.C.'s
Duplicate standard format, special format & data disks
Identify protection secrets and create your own schemes
Read track address; see actual track and sector numbers
Repair CRC errors
Exchange data address marks
Format 128, 256, 512 or 1024 byte sectors
Interface with Monitor/Disassembler
Analyze unknown DOS systems
Write special tracks; make protected disks
Print video display through RS232 or parallel port
AND MORE

✓ 265

\$38.95 Plus \$1.50 S & H

for unprotected disk and 31-page manual

Tennessee residents include 4.5% sales tax

For personal checks allow 2 weeks

Specify TRS-80* model I, III, or 4^{III}



(615)482-2007
RIDGE-TEC, INC.
740 Robertsville Road
Oak Ridge, TN 37830

*TRS-80 trademark Tandy Corp. **CP/M trademark Digital Research Corp.

ATTENTION SUBSCRIBERS

We occasionally make our mailing list available to other companies or organizations with products or services which we feel might be of interest to you. If you prefer that your name be deleted from such a list, please fill out the coupon below or affix a copy of your mailing label and mail it to:

CW Communications/Peterborough
80 Micro
PO Box 981
Farmingdale, NY 11737

Please delete my name from mailing lists sent to other companies or organizations.

Name _____

Address _____

City _____ State _____ Zip _____

80 MICRO

Multi-User Manufacturing Control Software

(XENIX™ OPERATING SYSTEM)



AT LAST
A system designed
specifically for manufacturing

- INVENTORY CONTROL
- MATERIAL REQUIREMENTS PLANNING
- CUSTOMER ORDER ENTRY
- ACCOUNTING

Features: —Menu Driven—System Security
—User Designed Data Base
—Customization Available

For More Information, Call or Write: **Software Concepts**
5786 Annarue Place
Columbus, Ohio 43229
(614) 895-7196

XENIX™ IS A TRADEMARK OF MICROSOFT CORPORATION

Copy CP/M - TRS-80 - PC/MS-DOS!

HYPERCROSS/XT 2.0 Direct Disk To Disk File Transfer

Now you can CROSS the barrier between disk formats! Using HYPERCROSS you can directly COPY files between TRS-80 disks and many different CP/M and IBM PC disk formats on your own TRS-80 or MAX-80. You can also FORMAT an alien disk, display the DIRECTORY, and KILL files. If you have different computers at home and work, use HYPERCROSS to transfer manuscripts, BASIC, FORTRAN PASCAL or C programs, Visicalc files, data bases and binary files.

*New feature - Mass file transfers Now you can copy many files at once using the new TAG feature in HYPERCROSS (XT V2.0 only) which allows you to tag any number of files for mass copy or deletion.

*Formats supported: IBM-PC and MS-DOS compatibles include DOS 1.1, 2.0/2.1 single and double sided and Tandy 2000. CP/M includes Aardvark, Access, Altos, ATR, CCS, Cromemco, DEC, Eagle, Epson, HP, IBM CP/M 86, Heath/Zenith, Kaypro, LNW, MAX-80, Morrow, NEC, Osborne, Otrona, Sanyo, Superbrain, Teletek, Televideo, TRS-80: Holmes, Hurricane Compactor, MM Shuffle Board, Montezuma, R/S CP/M 3.0+, Xerox, Zorba and standard 8 inch CP/M.

Hardware required: 48k and 2 drives minimum. Model 1 needs a doubler. Some formats need double sided or 80 track drives. 80 track skip supported.

PRICES including disk, manual and shipping:

Hypercross CP/M Single sided formats only \$49.95
Hypercross PC/MS-DOS Single sided formats only \$49.95
Hypercross XT V2.0 with 70 CP/M and PC formats \$99.95

Please specify TRS-80 Model 1, 3, 4/4P, or MAX-80.

NEW Supplementary format package

Now available - an additional 50 formats making 120 in all including: Rainbow MS-DOS, MAX-80, Olympia, TI, Toshiba, Sharp, Heath-Magnolia, all 8 of the new Montezuma version 2.2x formats and many others. Needs XT V2.0 to run - \$39.95 ppd.

HYPERZAP 3.2 DISK MAGIC!

If HYPERCROSS is the program for files then HYPERZAP is the program for sectors, tracks and whole disk! On the market for 2 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 will copy any TRS-80 format as well as many others such as CP/M, PC, CoCo etc. Specially designed to handle mixed density sectors on any track in any sequence. Many features for reading, writing, editing track and sector data. Hyperzap is the tool that lets you be in charge. Make your own self booting disks. Take your own CMD file and turn it into a dual booting Mod 1/III/IV disk.

Autopilot mode learns, saves and repeats procedures. Disk comes with fascinating examples including one to move your DS Montezuma CP/M 1.3x to 2.2x at a stroke - magic indeed! Hardware needed: 48k 1 drive minimum. One version for all TRS-80 models 1, 3 and 4. Manual and disk \$49.95 ppd.

May your====(*TRS-80*)=====live forever!

HYPERSOFT

PO Box 51155, Raleigh, NC 27609
(919) 847-4779 6-11 pm EST

*All trademarks are the properties of the companies represented.

✓46

BT SPECIALS

□ HARDWARE

MODEL 4 DISK UPGRADE KIT

Controller Board, Sound Board, Switching Supply, Tower Brackets, Cables, Nameplate & Instruction Manual
Retails at \$299.00 Our Price **\$199.00**

ADD ONS:

64K Memory Kit & Button

Retails at \$85.00 Our Price **\$50.00**

64K-128K Memory Kit (with PAL & Button)

Retails at \$99.00 Our Price **\$60.00**

RS 232 III/4

Retails at \$129.00 Our Price **\$79.00**

40 Track S/H Drives

Retails at \$199.00 Our Price **\$150.00**

40 Track Thinline D/H Drives

Retails at \$299.00 Our Price **\$195.00**

CERMETEK 300/1200 BAUD MODEM

Retails at \$599.00 Our Price **\$399.00**

MICROFAZER MP-64 K

Retails at \$299.00 Our Price **\$199.00**

□ SOFTWARE

DOS PLUS 3.5 Model I/III

Retails at \$149.00 Our Price **\$79.00**

DOS PLUS 4A with M ZAL

Retails at \$169.00 Our Price **\$109.00**

DOS PLUS 4 Epson QX-10

Retails at \$169.00 Our Price **\$109.00**

MAS 80 The micro-accounting system

Retails at \$599.00 Our Price **\$399.00**

µ Link II TRS-80 Model 4 Communications Software

Retails at \$110.00 Our Price **\$79.00**

□ ACCESSORIES & SUPPLIES

NO ZAP II A

Protect your valuable phone & modem equipment from surges and/or lightening **\$19.95**

3M DISKETTES

SS/DD 5¼"	\$23.50/10	SS/SD 8"	\$25.50/10
DS/DD 5¼"	29.50/10	SS/DD 8"	31.75/10
DS/DD 5¼"	39.75/10	DS/DD 8"	40.95/10

CENTECH RAINBOW PACK (10 Assorted Colors)

SS/DD Rainbow	\$19.95
DS/DD Rainbow	26.95

COMPUTER CARE KIT

Includes diskette head cleaner, drive cleaning solution, anti-static spray, screen and terminal cleaner, swabs **\$19.95**

RIBBON CARTRIDGES for Epson Printers

MX 80/FX 80/RX 80	
Black, Red, Blue, Green, Brown	\$4.25
MX 100/FX 100/RX 100	
Black only	\$7.95

CALL (800) 645-1165 FOR COMPLETE LISTING OF OUR CLOSE-OUT SPECIALS



B.T. Enterprises Dept. 1B
10 Carliough Road
Bohemia, NY 11716-2996
(516) 567-8155 (800) 645-1165
B.T. Enterprises is a division of
Bi-Tech Enterprises Inc.

All prices above include 2% cash discount
Credit card customers add 2% to prices
Add \$4.00 shipping & handling on all prepaid orders
Add \$7.00 shipping & handling on C.O.D. orders
✓300 Mastercard/Visa

Domestic Executive

Superex Home Software organizes your home with Home Executive (\$89.95), an integrated software package for the Models 1200 and 2000 that helps you plan and organize home activities.

Home Executive comprises nine programs: Address Book, Appointment Book/Calendar, Checkbook, Collector's List, Household Inventory, Gift List, Expenses, Portfolio Manager, and Financial Analyst.

Financial Analyst calculates loan payments, compound interest for deposits, monthly annuities, and future values of investments. Expenses itemizes deductible expenses for your tax return. The Checkbook program entries automatically create expense entries and flag deductions.

For more information, contact Superex Home Software, 151 Ludlow St., Yonkers, NY 10705, 800-862-8800 (in New York, 914-964-5200).

Reader Service ✓ 553

Spreadsheet on a Chip

Portable Computer Support Group's new Model 100 spreadsheet is a solid product—literally. Lucid (\$149) comes on a Snap-in ROM chip that plugs into the Model 100's expansion compartment underneath the unit.

Once installed, the spreadsheet appears on the Model 100's main menu as



Lucid is a plug-in spreadsheet for the Model 100.

a built-in program. Lucid builds spreadsheets of up to 255 rows by 126 columns and doesn't use memory for loading data, spreadsheet operation, or unused cells.

Lucid calculates a 36-column financial statement in fewer than 4 seconds. You can also set column widths individually and refer formulas to cells in other spreadsheets. The cut, copy, and paste feature lets you move spreadsheet formulas and data, then recalculates the entire spreadsheet.

Contact PCSG at 11035 Harry Hines Blvd. #207, Dallas, TX 75229, 214-351-0564 for more information.

Reader Service ✓ 571

Extended Math

The Math Master Series from PAB Software Inc. (Box 15397, Fort Wayne, IN 46885, 219-485-6980) consists of 20 Basic enhancement programs that

add advanced math functions to Model I/III Basic.

Programs are available for matrix, polynomial, and vector arithmetic, statistics, fast Fourier transformations, and signal processing. Single- and double-precision versions and complex-formula versions are available starting at \$24.95.

The Executive module (\$24.95) loads programs as needed, giving a virtual-memory effect. Math Master lets you create programs that are compact and that execute quickly, making Basic as powerful as any other language for science and engineering work.

Math Master Chain (\$25) lets you run Basic programs larger than computer memory. Chain loads the program from disk in sections so the whole program doesn't reside in memory at once. Math Master programs are also available in packages starting at \$149.

Reader Service ✓ 566

Dot by Dot

Structured Software Services (9233 N.E. 269th St., Battle Ground, WA 98604) offers a Model 100 screen printing subroutine (\$17) that lets you print on-screen text and graphics on dot-matrix printers from within your programs.

The package includes programs for TRS-80, Epson, Prowriter, and Star Micronics printers. The TRS-80 program supports all DMP printers in the seven-dot graphics mode. The Epson version runs FX-, RX-, and MX-80 Grafrax printers.

The Prowriter program runs on all C.Itoh models with Prowriter-style bit-image graphics. The Star version supports the Gemini, Delta, and Radix printers. Programs require 300-600 bytes.

Structured Software also offers a Model 100 monitor program (\$27) that translates Z80-style mnemonics to machine instructions and loads them in memory. The program requires 16K and features 23 commands for debugging and searching programs and monitoring registers. It includes two manuals.

Reader Service ✓ 554

The Last Detail

The SS-X Basic spreadsheet program (\$9.99) for the Models 1200 and 2000 calculates cash flow, expenses, sales projections, and stock portfolios.

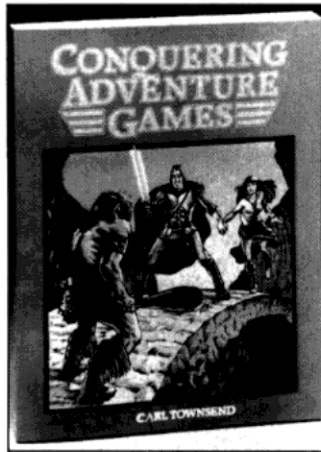
SS-X features a help command and fast execu-

tion speed, and lets you input data without waiting for the program to recalculate the spreadsheet. The program runs with color or monochrome monitors (monochrome only on the Model 2000) and can format and color the display cell by cell.

You can expand the program with an optional data base manager with a built-in sort/merge feature, data base screen writer program, and a word processor. You can transfer files from the data base module to the word processor or spreadsheet program.

Optional programs are \$39 each. The complete package is \$89. For more information, contact Micro Architect Inc., 6 Great Pine Ave., Burlington, MA 01803, 617-273-5658.

Reader Service ✓ 562



Conquering Adventure Games shows how to win at 10 popular adventures.

The Elements Of Adventure

You're entering a world of thieves, vampire bats, and giant trolls. A guardian cyclops, demons, and grues block your way as you walk through the labyrinth of dungeons. Your task: to

survive the perils of the empire and bring 20 treasures to the surface.

Conquering Adventure Games by Carl Townsend (\$14.95) will get you out alive. This book teaches you the strategies needed to win Zork I, II, and III, Adventure 350/550, Deadline, Witness, Suspended, Starcross, Nemesis, and Dungeon Master.

Each chapter starts with a game overview and objective, then describes techniques for mapping and exploring. The book also discusses the mythology and theology behind adventure games, and strategies for winning.

Contact Dilithium Press, 8285 S.W. Nimbus, Suite 151, Beaverton, OR 97005, 503-646-2713 for more information.

Reader Service ✓ 568

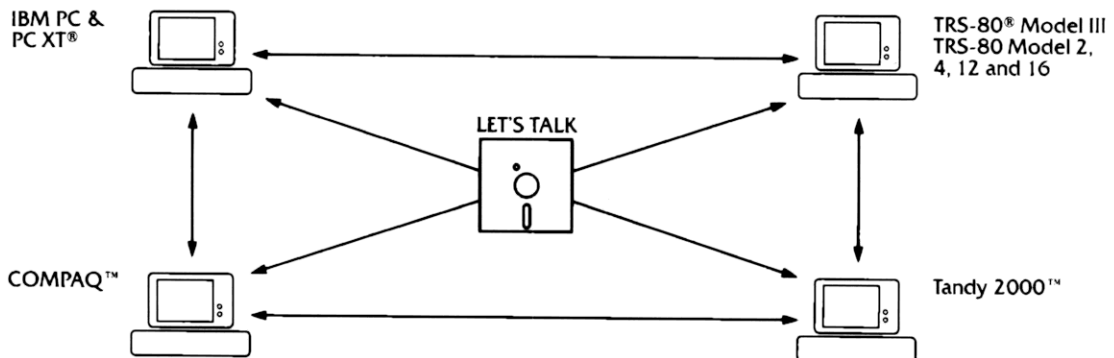
Briefcase Data Base

The Database Development and Management System (\$19.95) for the Model 100 includes two modules. The first lets you define data base elements and presents a screen through which to add, delete, or change data. It also lets you specify key field and editing characteristics. You can create up to 10 fields per data base with a maximum record size of 240 characters.

The second module, Database Manager, formats the screen so you can add, delete, and change records. The program compacts and edits data during storage. You can search through the data base by character or string and print selected data for reports or lists.

DDMS includes a user's guide and templates for ex-

Communications Gap? LET'S TALK™!



LET'S TALK CLOSES THE COMMUNICATIONS GAP BETWEEN TODAY'S POPULAR PERSONAL COMPUTERS.

LET'S TALK is a complete package for fully supported communications between any of these computers. In any direction. Without additional expense.

LET'S TALK is a simple, straightforward program that transfers ASCII data files, including BASIC and VisiCalc®, from one computer to

another. Precisely. Easily. Without professional, expensive data processing expertise.

LET'S TALK allows two computers to communicate directly with each other in a "conversational mode" when not actually transferring data. And, LET'S TALK can send or retrieve files of any size from unattended computers, at three different speeds.

GROWTH AND EXPANSION REQUIRE OPEN COMMUNICATION. LET'S TALK.



Making dollars and sense out of information.

TRS-80 is a registered trademark of Tandy Corporation. Tandy 2000 is a trademark of Tandy Corporation. Visi Calc is a registered trademark of VisiCorp. IBM PC and PC XT are registered trademarks of IBM Corporation. COMPAQ is a trademark of Compaq Computer Corporation.

a division of the goodman group, Inc. 12900 Preston Rd., Dallas, Texas 75230 (214) 239-6085
LET'S TALK includes all diskettes for each of the above computers. Suggested retail price \$179.00 + \$5.00 shipping

✓ 496

NEW PRODUCTS

pense accounts, checkbook accounting, student grading, project management, and membership lists.

Contact CBG software, 29829 Linda, Livonia, MI 48154 for more information.

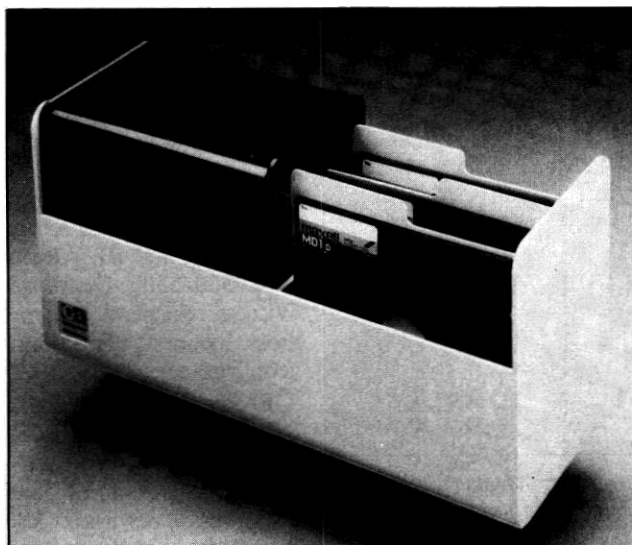
Reader Service ✓ 559

A File Named Slim

The Slim File from Computer Accessories Corp. (7696 Formula Place, San Diego, CA 92121, 619-695-3773) is a thin-profile desktop disk file that holds up to 50 5¼-inch disks.

Slim File's \$24.95 price includes two compartments with adjustable dividers and labels, a smoke-tint sliding cover, and rubber feet that protect desk surfaces. The file is available in beige and measures 12½ by 5 by 7 inches.

Reader Service ✓ 564



Slim File's clear sliding cover keeps out dust and dirt.

Statistical Resolution

Statistics (\$100) is a series of statistics learning programs for the Model 4 with the high-resolution graphics board. Programs include graphics demonstrations

and random simulations covering important ideas and methods.

The menu-driven series includes programs on normal distributions, binomial distributions, central limit

theorem simulation, confidence intervals, T distributions, and linear regression.

The programs are flexible so you can choose input data and parameters without programming knowledge. For more details, contact Mathe-Graphics Software, 61 Cedar Road, E. Northport, NY 11731, 516-368-3781.

Reader Service ✓ 569

Pins and Ribbons

Models I and III owners can get high-resolution graphics on the Epson (with Grafrax) and Gemini printers with the Hi-Res Screen Dump utility (\$19.95).

This utility converts TRS-80 graphics codes to high-resolution dot-matrix print format so you can dump screen text and graphics to your printer.

Hi-Res uses the top 1K of memory and operates with



Sales Company

704 W. Michigan Ave. P.O. Box 8098
Pensacola, FL 32505 Florida 904/438-6507

TABCO PARALLEL Printer Switch
connect 2 printers to one computer!

PSM-C/2P—Manual printer switch. Prolongs the life of your printer/interface connectors. Saves time & money! Use your existing printer cable to connect TAB SWITCH to your computer. Comes complete with two 3.5' cables to connect your printers. Straight-forward design makes it easy to set-up & use. 1 year limited warranty.



ORDER TODAY
Only \$69.95

Other models available
Dealer inquiries invited
\$2.50 Shipping/Handling
Florida residents add 5% sales tax

✓ 189



CALL 1-800-874-1551



SAVE A BUNDLE
EPSON,
OKIDATA, BROTHER,
TABCO
Printer Switches
Custom Printer Cables
IJG Products
Elephant Memory Diskettes

INCREASE KEYBOARD SPEED!

Tandy gave HyperTyper® a
★★★★ rating for both
TRS-80 and Tandy 2000

for only \$29.95

★ HyperTyper® is a complete software program designed to help you make the most of your computer.

★ HyperTyper® is under your control—you go at your own speed; not at the program's demand.

★ HyperTyper® uses real words, sentences and paragraphs, not nonsense syllables.

★ Although the text is light-hearted and fun, HyperTyper® is not a game, but a serious, powerful teaching tool.

★ This is a flexible, easy-to-learn and easy-to-use program that can aid everyone from novices to advanced typists.



SEE YOUR DEALER NOW
STANDARD SOFTWARE

Suite 1600—121 S.W. Salmon St.
Portland, Oregon 97204
(503) 227-0008

✓ 213

TRS-80 & Tandy 2000 registered trademarks of Tandy.

NEW PRODUCTS

two keystrokes. It's available on tape or disk. For more information, contact Softbyte Computing, Box 217, Wallingford, CT 06492, 203-239-6923.

Reader Service ✓ 563

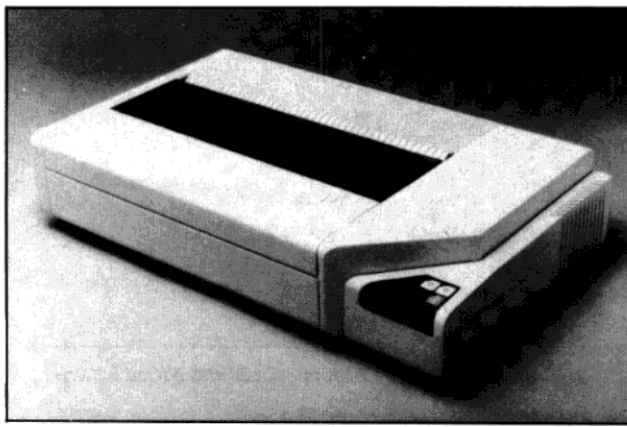
Keyboard Bridge

Bridge-80 (\$16.95) lets you play bridge card games with your Model I, III, or 4. The program features bidding, playing with the computer as your partner, and popular card-playing configurations.

You can play hands-open, and Bridge-80 replays hands for review. Documentation includes the basic rules for playing bridge.

For more details, contact Recreational Mathematical Software, 129 Carol Drive, Clarks Summit, PA 18411, 717-586-2784.

Reader Service ✓ 567



The OT-700 700-cps dot-matrix printer.

Jiffy Printing

Output Technology Corp. (606 110 Ave. N.E., Suite 205, Bellevue, WA 98004, 206-453-9794) offers the OT-700, a 700-character-per-second (cps) dot-matrix printer that runs at 350 cps in correspondence mode and features dot-addressable graphics.

The OT-700 has a 136-column carriage with adjustable sprocket-feed tractors, control switches, and indicator lights. The unit is quieter at full speed than a standard office typewriter.

The OT-700 is \$1,595, including Centronics and parallel interfaces. Additional character sets and foreign-

language fonts are also available.


Reader Service ✓ 556

Service Calls

A subscription to the NationServ on-line information network puts you in touch with a wide variety of information, goods, services, and entertainment.

With your computer and modem, you can access NationServ to download job service listings and business programs, participate in user's groups, buy discounted goods, transfer information, and communicate with other users through the Message Center and Electronic Mail Service.

Business software includes applications for amortization, depreciation, IRAs, and ratio analysis. You can download games, programs, files, reports,



The Statistician
Version 2.0

NEW
First in
Its Class
and
Looking
for
Work.

TRS-80 1, 2, 3, 4, 12, 16 CPM XENIX

- * Multiple Regression
- * Stepwise Ridge
- * All Subsets
- * Backward Elimination
- * Time Series Analysis
- * Descriptive Statistics
- * Transformations

- * Survey Research
- * Nonparametrics
- * X-Y Plots
- * ANOVA
- * Random Samples
- * Data Base
- * Search & Sort
- * Hypothesis tests

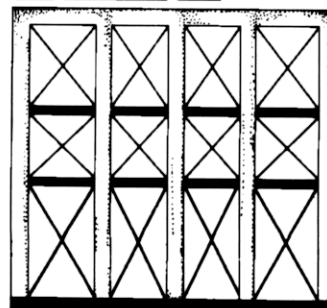
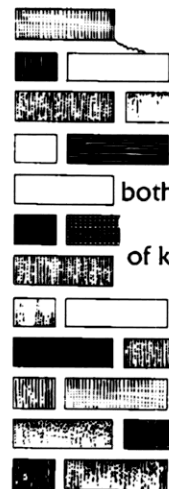
Please call **TOLL FREE**
1-800-334-0854 (Ext. 814)

Q

for more information
or write:
Quant Systems ✓194
Box 628
Charleston, SC 29402
•VISA/M/C Accepted

BRICKWARE

If you invest in brick and mortar, then you should invest in our brickware, Investor III™. Designed by real estate professionals to work on the IBM PC or TRS-80, Investor III™ is a comprehensive software package that aids in investment analysis of property, whether commercial or residential, small or large. It shows both the tax **and** cash aspects of an investment opportunity and is flexible enough to allow you to vary a number of key assumptions (such as cash flow, phased investments, multiple mortgages, and tax parameters) and see the results in an instant. So if you are serious about brick and mortar, look at our brickware. It will help you lay a solid foundation for your investment strategy. Contact your local dealer.



GOOD
SOFTWARE CORP.

✓ 103

A Division of The Goodman Group, Inc.
12900 Preston Road
Dallas, Texas 75230
(214) 239-6085

\$249.00 Suggested Retail
Making dollars and sense
out of information.

80 Micro, February 1985 • 139

NEW PRODUCTS

and articles of interest from the Features section.

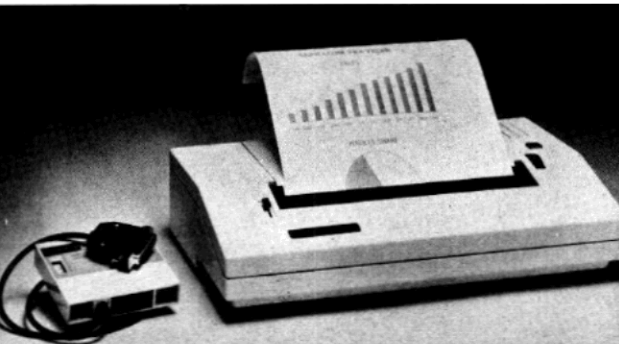
NationServ operates 24 hours a day at 300 or 1,200 baud. An annual subscription is \$10. For more information, contact NationServ, Box 391, Fairfield, IL 62837, 618-847-2381 (voice), 618-847-2291 (system).

Reader Service ✓ 557

Printers Revealed

Alphacom Inc. (2323 S. Bascom Ave., Campbell, CA 95008, 408-559-8000) offers the Traveler and Alphapro printers for the office and the road.

The Traveler (\$199) is a 60-cps, 5¼-lb. thermal printer that fits into a standard briefcase and prints up to 100 pages of text using rechargeable NiCad batteries. It comes with a roll of thermal paper, batteries, and an ac adapter/recharger. Serial



The Alphacom Traveler thermal printer uses NiCad batteries.

and parallel interfaces are \$49.95. A carrying case is also available.

The Alphapro 18-cps letter-quality printer uses Qume and Diablo print wheels and ribbon cartridges, and features a 93-byte buffer (or an optional 4000-byte buffer), proportional spacing, bold-face, double-strike, phantom spaces, super- and subscripts, and reverse line feeds.

An intelligent interface

cable (\$49.95) connects to parallel and serial ports.

Reader Service ✓ 561

Put Yourself In Control

Logical Systems Inc. (8970 N. 55th St., Box 23956, Milwaukee, WI 53223, 414-355-5454) offers two utility packages for the Model 4.

The Overdrive (\$99) per-

formance utility for the 128K Model 4 with TRSDOS 6.2 features dynamic track buffering for up to two drives, using part of alternate memory. It also places nonlibrary system overlays in alternate memory for fast access.

The LS-Utility disk (\$49) comprises eight filters and utilities for TRSDOS 6.X. The keyboard filter converts numbers between hexadecimal, decimal, and binary format. Trap lets you locate and throw away a character during input and/or output on any device.

RDTEST performs a nondestructive read verify for disk drives. READ40 reads a 40-track disk in an 80-track drive for back-ups, conversions, and other read-only operations.

TYPEIN controls programs that you can't run

World's Finest Computer Books

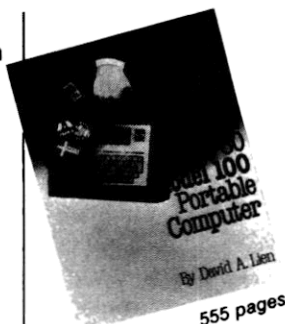
By David A. Lien

LEARNING TRS-80 MODEL 4/4P BASIC

A complete tutorial course in BASIC. Learn programming from the authority on the BASIC computer language, David A. Lien. You'll have your hands on the keys from the very beginning and find your confidence and skills growing with each chapter. **\$19.95**



483 pages



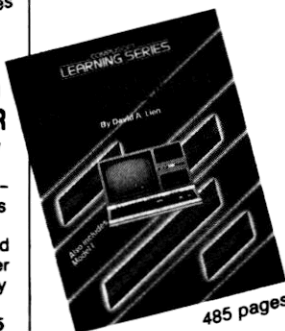
555 pages

THE TRS-80 MODEL 100 PORTABLE COMPUTER

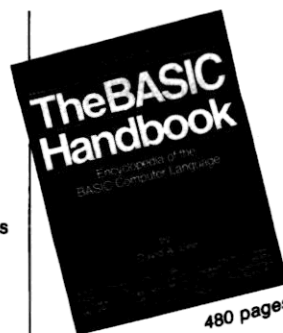
Everything you need to know to master the Model 100. Instructions for all of the built-in software as well as Lien's comprehensive course in BASIC programming tailored for the Model 100. Whatever your use of the computer may be, this book provides the guidance you need. **\$19.95**

LEARNING TRS-80 MODEL III BASIC (includes the Model I)

Puzzled over efficient programming methods for your Model III? Learn by experience with our proven BASIC tutorial written specifically for your computer. Develop the skills to write your own custom software and enjoy it! **\$19.95**



485 pages



480 pages

THE BASIC HANDBOOK, 2nd Edition

The most complete BASIC reference ever! 500 BASIC words alphabetically listed with test programs, sample runs, and variations in usage. Perfect reference for all programmers and especially valuable to those translating programs written for one computer to run on another. **\$19.95**

COMPU\$OFT

• PUBLISHING •

The Symbol of Excellence

TRS-80 is a registered trademark of Radio Shack, a Division of Tandy Corporation.

To Order: Call **TOLL FREE 800 854-6505** (in Calif. 619 588-0996)
Or send your order to CompuSoft Publishing, 535 Broadway,
Dept. 200984, El Cajon, CA 92021

Please add \$2.00 for P&H (\$3.00 for foreign orders) to the cost of the book(s). Include your name, address, title and number of book(s) ordered, check, MasterCard or Visa number with expiration date. Books will be shipped via parcel post book rate unless otherwise requested and paid for in advance.

30 DAY MONEY BACK GUARANTEE

with a JCL file. KSMPLUS provides predefined key macros, redefines keys, repeats the last DOS command, sends a top-of-form character to the printer, returns system data or time, and defines shifted and unshifted function keys.

Other utilities build character translation tables and provide slashed zeros on printers with backspacing.

Reader Service ✓ 558

Better Back-Ups

T-Backup (\$19.95), a Model 100 back-up utility, quickly copies computer memory to cassette, verifies back-up copies and restores them to the computer.

Back-up copies take about four minutes, and include all text, Basic, and machine-language files. You can tag copies with the date and time of back-up



T-Backup backs up Model 100 memory in four minutes.

and a comment identifying the data.

T-Backup includes a taped tutorial and manual with step-by-step instructions. Contact Traveling Software Inc., 11050 Fifth Ave. N.E., Seattle, WA 98125, 206-367-8090 for more information.

Reader Service ✓ 565

Get into the Swing

The CBIO System (\$155) biorhythm profile program for the Models III (48K) and 4 (64K) lets you predict people's good and bad days according to physiological indicators and intellectual acuity.

The program contains 20 menu-driven modules that

use data input screens. The modules process orders; generate reports, invoices, and labels; provide on-line information, record a client's history; and let you develop a customized biorhythm.

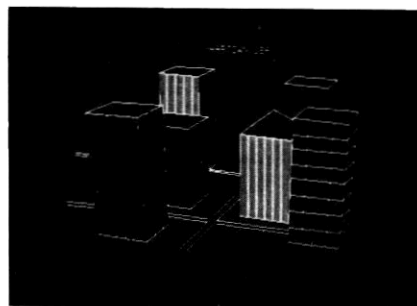
The report generator produces a commercial-quality report with a choice of five covers, a preface, and an introduction describing biorhythms and the CBIO report. CBIO prints biorhythmic curves and a short analysis for each day, followed by a day-by-day interpretation for the month.

CBIO processes up to 100 reports automatically. The program requires two disk drives. For more information, contact Bluebirds Computer Software, P.O. Box 339, Wyandotte, MI 48192, 313-285-4455.

Reader Service ✓ 560

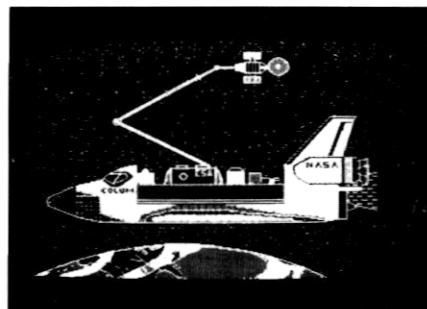
Grafyx Solution™ Save \$100.00

High-Resolution Graphics for Mod 4/4P/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, 4P, or III. Installation is easy with the plug-in, clip-on 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 20 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, LDOS, NEW-DOS80, and DOSPLUS. The Grafyx Solution is also supported by a number of optional applications programs: Draw, Bizgraph, xT.CAD, 3D-Plot, Mathplot, Surface Plot, Biorhythm & USA, Music.

The Grafyx Solution package is shipped complete for \$199.95 (reduced from \$299.95). A manual for review is \$15. Payment may be by check, Visa/MC, or COD. Domestic shipping is free on pre-paid orders. Texas residents add 5% tax. ✓464

MICRO-LABS, INC. 214-235-0915
902 Pinecrest, Richardson, Texas 75080

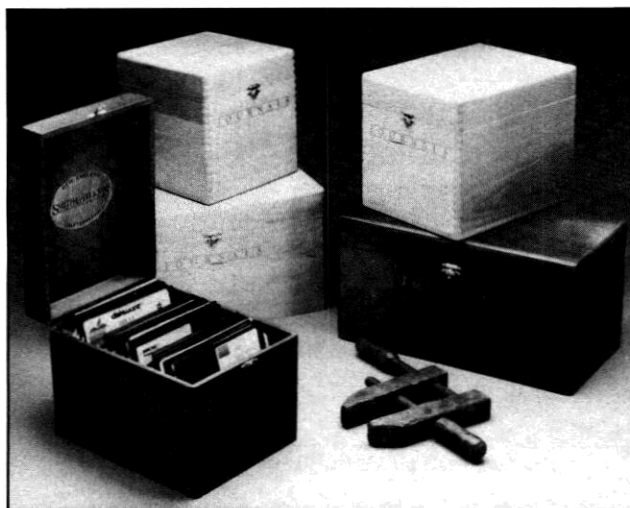
NEW PRODUCTS

Wood 'N' Disks

Hand-crafted wooden Diskette Chests from Smith & Bellows Co. (One Amherst Office Park, P.O. Box 668, Amherst, NH 03031, 603-673-8482) store your disks elegantly. Each chest features fine joinery, hand-finished lacquer surfaces, and brass-finish hardware.

Diskette Chests are available in four sizes to accommodate 40, 60, or 80 5¼-inch disks, or 60 3½-inch disks. Prices start at \$29.95.

Reader Service ✓ 551



Wooden Diskette Chests from Smith & Bellows Co. are hand-crafted.

Through Rain or Sleet Or Snow...

Post Plus (\$160) integrates message processing and telecommunications on the Models II, 4, 12, and 16. This package creates and sends letter-perfect text with communications services such as MCI Mail, Easy-

Link, CompuServe, The Source, and the Dow Jones News/Retrieval Service.

The Post Plus message processor produces ASCII files for convenient communication. Features include auto-log-on sequences, programmable

user keys, automatic data capture to disk, simultaneous printer output, and a help function.

Post Plus includes \$500 worth of subscriptions, passwords, and on-line time with electronic mail and information services. For in-

formation, contact MCTel, Three Bala Plaza E., Suite 505, Bala Cynwyd, PA 19004, 215-668-0983.

Reader Service ✓ 555

Copy Clipboard

The Non-Magnetic Copy-Holder from Wilson Jones Co. (6150 Touhy Ave., Chicago, IL 60648, 312-774-7700) makes word processing easy: it provides clips to secure documents and hold book pages open while you type, and a transparent line guide highlights the line you're typing. The line guide contains a pica/elite type gauge and an inch/centimeter ruler. Copy-Holder doesn't damage data stored on magnetic media.

CopyHolder is made of steel with rubber feet. It's available in black or putty colors and in letter (\$29.80) and legal (\$31.90) sizes.

Reader Service ✓ 552



Power Problems?

SURGES!
SPIKES!
RF/EMI
DIPS!
SAGS!
BLACKOUTS!
BROWNOUTS!

AGIS®... Power Conditioning Equipment... THE SOLUTION
Protects From Damaging Voltage Surges, Lost Data, & Costly Down Time



SPIKE-SPIKER®

Transient Voltage Suppressors & Noise Filters
Eleven Models — All Models Rated 120V, 15A

Deluxe Power Console—2-stage transient absorber; dual 5-stage filter; common & differential mode protection; nano seconds response; clamping at 150V; 8 individually switched sockets; fused; master switch; 7' cord and status lite. **\$89.95.**



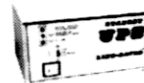
Quad Power Console—6-stage transient absorber; dual 5-stage filter; common & differential mode protection; pico second response; clamping at 131V; four outlets; fused; master switch; 7' cord and status light. **\$75.95**



Mini II—Direct AC Plug-In; 2-stage transient absorber; dual 3-stage filter; common & differential mode protection; nano second response; clamping at 150V; two outlets and status lite. **\$44.95**

LINE-SAVER™

Standby Uninterruptible Power System
—Clean Reliable Power System—



Model LS-240—240 watts—VA capacity; increased back-up time: 11 min. full load, 27 min. ½ load, 43 min. ¼ load; 4-AC outlets; 3-staged transient protection; dual 4-staged RFI/EMI filter; sealed rechargeable internal battery; master control switch; test switch; external fuses; detachable 6' cord; external DC connectors for mobile use and extended hold-up time; many more exclusive features. **\$485.00**

Call or write for free literature.

Dealer inquiries invited.

KALLO®

6584 Ruch Rd., Dept 80
Bethlehem, PA 18107



INSTANT ORDER LINE
800-524-0400 TWX 501-651-2101
IN PENNA. 215-837-0700

PA Res. add 6% sales tax; for COD add \$3.00 + shipping & handling. All pre-paid SPIKE-SPIKER orders, freight allowed. All LINE-SAVER orders add \$10.00 shipping & handling.

Before this happens, call SAFEWARE

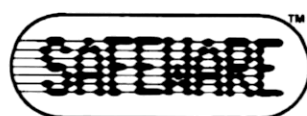
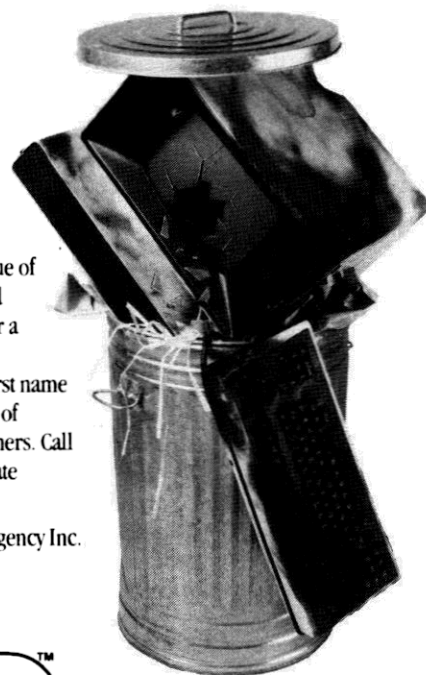
800/848-3469

(In Ohio, call
614/262-0559)

Protects your computer against theft, fire, power surges and other accidental losses. Insures your entire system for as little as \$35 a year — depending on the value of your hardware, software, and media. Full replacement after a low \$50 deductible.

We're SAFEWARE™ the first name in computer insurance. Tens of thousands of satisfied customers. Call toll-free for rates or immediate coverage.

SAFEWARE, The Insurance Agency Inc.
P.O. Box 02211
2929 N. High Street
Columbus, Ohio 43202



✓ 368

NEW PRODUCTS

DIFFERENT TRACK

Heat Seeker

The Programmable Furnace Controller (PFC) from Future Projects Corp. (Box 11, Hawleyville, CT 06440, 203-775-6872) is a hardware and software package that monitors and controls your furnace.

PFC connects to any computer with an RS-232 port. Once you program PFC, it operates independently of your computer. To monitor the system's performance or make adjustments, reconnect PFC to your computer.

Features include programmable temperature settings, override controls, cycle and temperature history for each zone and sensor, a real-time clock and calendar, and a battery back up.

PFC uses a simple command structure for easy programming and works in parallel with 24-volt thermostats. It comes with a built-in power supply, two temperature sensors (3 for 2-zone systems), wire, and a manual and programming guide.

PFC requires a furnace with a 24-volt ac control circuit (rated 1 amp max), and is available in one-(\$349) and two-(\$399) zone systems.

Reader Service ✓ 570

New Products Index

Reader Service Number	Company	Page
561	Alphacom Inc.	140
560	Bluebirds Computer Software	141
559	CBG Software	137
564	Computer Accessories Corp.	138
568	Dilithium Press	137
570	Future Projects Corp.	143
558	Logical Systems Inc.	140
569	MatheGraphics Software	138
555	MCTel	142
562	Micro Architect Inc.	136
557	NationServ	139
556	Output Technology Corp.	139
566	PAB Software Inc.	136
571	Portable Computer Support Group	136
567	Recreational Mathematical Software	139
551	Smith & Bellows Co.	142
563	Softbyte Computing	138
554	Structured Software Services	136
553	Superex Home Software	136
565	Traveling Software Inc.	141
552	Wilson Jones Co.	142

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.



EPROM PROGRAMMING SYSTEM
For TRS-80 MODELS I, III, OR IV

1. Program contents of buffer to EPROM.
2. Verifies contents of buffer against EPROM.
3. Reads contents of EPROM to TRS-80 buffer.
4. Checks if EPROM is erased.
5. Displays contents of buffer.
6. Ability to edit buffer from TRS-80 keyboard.
7. Reads both prom image and command files from disk.
8. Stores prom image files to disk.
9. Fast program mode for duplicating EPROMs.
10. Software sets up programming parameters from EPROM type.

MODEL EP-2A-79 EPROM PROGRAMMER, TR-24 parallel interface, disk software (specify TRSDOS or CP/M), and personality module PM-5 for programming 2716, 2758 EPROMs. \$225.00

Personality modules available for 2708, 2716, TMS2716, 2732, 2732A, 2532, 2764, 2564, 27128, and MCM68764 EPROMs; 2816A EEPROM; 8751, 38E70 MPU \$17 to \$35.

Optimal Technology
Earlsville, Va 22936
804-973-5482

✓201

FREE SHIPPING DISKETTES

West Coast "Call" 1(800) 621-6221
Central & East "Call" 1(800) 654-4058
Discounts Starting at 3 Box Quantities

3M	Dysan	maxell	Verbatim
• 5¼"	• 5¼"	3½" CALL	• 5¼" Datalife
s-side 17 ⁹⁵	s-side 22 ⁹⁵	s-side 19 ⁹⁵	s-side 18 ⁹⁵
d-den. 23 ⁹⁵	d-den. 30 ⁵⁰	d-den. 25 ⁹⁵	d-den. 24 ⁹⁵
s-side 27 ⁵⁰	s-side 34 ⁵⁰	s-side 28 ⁹⁵	s-side 30 ⁹⁵
d-side 33 ⁹⁵	d-side 45 ⁵⁰	d-side 36 ⁹⁵	d-side 39 ⁹⁵
quad 8"	quad 8"	quad 8"	quad 8"
s-side 21 ⁵⁰	s-side 28 ⁵⁰	s-side 31 ⁹⁵	s-side 24 ⁷⁵
s-den. 26 ⁰⁰	s-den. 30 ⁹⁵	s-den. 34 ⁹⁵	s-den. 26 ⁹⁵
d-den. 31 ⁵⁰	d-den. 34 ⁹⁵	d-den. 34 ⁹⁵	d-den. 31 ⁹⁵
3M	AMARAY MEDIA MATE		Head Cleaners
DC100A...13 ⁹⁵	(3½"...11 ⁹⁵) (5¼"...11 ⁹⁵)		Kits...520
DC300A...18 ⁴⁰	DISK MINDERS		Refills...955
DC300XL 20 ²⁵	(5¼"...1675) (8"...2150)		Analizers 2500
DC600A...24 ⁴⁵	BULK PACKED DISKS "CALL"		

Diskettes 10/Box the **Diskette Connection**™
OKLAHOMA & NEVADA
UP's Delivery Only. Add 3⁰⁰ on orders under 35⁰⁰ or 20 disk.
Dealer Inquiries Welcomed 1(800) 654-4058
VISA

How to Keep In Touch with Tandy

Send your questions about Tandy products and services to Ask Tandy, 80 Micro, 80 Pine St., Peterborough, NH 03458.

Q: Tandy claims to have an extensive customer support capability, yet I've never received anything about bugs in or upgrades to my Model 4. My letters to one Tandy executive have gone unanswered. This is customer service?

A: Tandy's support system sends letters to every registered owner of a product, every time we issue a customer support bulletin that affects all owners of that product.

Many customers never send in their registration cards, apparently figuring they can send them in when they have trouble, thereby extending their warranties by the elapsed amount of time. Tandy bases its warranties on the date on your original sales ticket, nothing else. We have no "warranty cards."

Some of the cards we receive are incomplete; however we do try to follow up on them. Some are illegible. Some people move without leaving a forwarding address. Our system works, and we use it religiously, but it won't work for you without your help. You must register with us, legibly, and keep us informed of your correct address.

Letters to Tandy executives are another subject. We answer all mail, but we forward each letter to the person or department responsible for handling it. Questions, problems, or complaints should go to our Computer Customer Services address. Sending them elsewhere simply delays our response.

Q: With TRSDOS 1.3 (Model III mode), I have 38,202 bytes of RAM available in Basic on my Model 4. LDOS 5.1.4 gives me 34,171 bytes. The IBM PC and Compaq provide 61,818 bytes.

Why didn't Tandy make more RAM available on the Model 4?

A: TRSDOS 6.0 (LDOS), for the Model 4 mode, is much more powerful and therefore takes up more room than TRSDOS 1.3 for Model III mode operation. The other bank of RAM isn't available on the Model 4 from BASIC; to our knowledge, there isn't a bank-switching Basic for the Z80. The reason you get more RAM on the PC or Compaq is that they're 128K, 16-bit machines, and are capable of directly addressing more memory than an 8-bit system.

Maximum usable RAM is always a prime consideration with us, but there's a tradeoff between that and the power of the system. By the way, our check of a Model 4 found 29,948 bytes available, but that'll vary with the version of Basic and the operating system in use.

Q: Why has Tandy decided to abandon loyal tape customers by not bringing out a cassette-based computer with all the Model 4's features, like an 80-column by 24-line screen?

A: The Model 4 features you refer to are a function of the hardware as well as the disk operating system. It simply isn't possible to produce a cost-effective cassette-based unit with those capabilities. Now that the price of the dual-drive Model 4 is \$1,299, enthusiasm for the cassette version among new purchasers is very limited.

Q: Will Tandy publish a more detailed version of the Tandy 2000 programmer's reference manual that documents more BIOS (Basic input/output system) and interrupt vector calls.

A: No, since we don't have facilities in-house to support that type of information for the non-professional programmer. The information is available to software houses through our Third Party Software Support Group.

Q: Are you planning to sell an 8087 math coprocessor for the Tandy 2000, and if so, when?

A: My experts tell me the current 8087 chip won't function with the Tandy 2000's 80186 processor. Our people are actively investigating the question with Intel now, but we've made no firm decision. We'd suspect the possibilities are good, but don't count on it until further notice.

Q: The May 1984 80 Micro mentions an MS-DOS update, version 3.0 (see "Up Close...Tandy's Model 2000," p. 84). When will it be available?

A: As of this writing, MS-DOS 3.0 seems to require more memory space, and offers no real advantage to the Tandy 2000 owner. We still haven't decided whether to bring it out or to wait for the next version.

Q: Is it true that Tandy's developing a new line of Model 4's, called the Model 4C, featuring color graphics?

A: You probably heard rumors about the now-public Tandy 1000, which falls into the same price class as the 4, but is a member of our MS-DOS family. We expect the 8-bit Model 4 to continue to sell, and don't consider the Tandy 1000 a replacement for it. We have no plans for a color version of the Model 4 or an Apple IIc look-alike.

Q: Since the Model 4 has a Model III mode using a ROM image, can it also have a Model I mode?

A: The Model 4 doesn't use a ROM image, but actually contains the Model III ROM. It might be possible to load in a Model I image, as in the Model 4P, which loads in a Model III ROM image. But most Model I software runs on the Model III, so a Model I mode isn't needed. ■

T/Maker Integrated Software. Simple, Powerful, Well Liked.

now available for the
Model 4/4P
under TRSDOS (64K)
\$299
(cat. 90-0128)

Peelings II

THE MAGAZINE OF APPLE
SOFTWARE AND HARDWARE EVALUATION

"The program is a pleasure to use... [it] is well implemented, well documented, and is quick in operation. It deserves an AA rating."

—F.M. Remley, 7/83

InfoWorld

The Newsweekly for Microcomputer Users

"T/Maker is a superb product! I have yet to see anything that comes close to its level of system integration, overall ease of use and general sophistication."

—Tim Daneliuk, 7/11/83

Excellent

Performance ✓
Documentation ✓
Ease of Use ✓
Error Handling ✓



"...if you regularly prepare documents combining text, charts, and lists, ...if you belong to an organization

that uses several different kinds of microcomputers...if you want to reduce the training burden and improve the capability of sharing files...T/Maker can become the key program in your software library!"

—Frank J. Derfler, Jr, 4/84

COMPUTING FOR BUSINESS

INTERFACE AGE Magazine

"After using T/Maker for some time, my reaction is that this program accomplishes its job simply and without effort."

—Michael Heck, 3/84

POPULAR COMPUTING

"T/Maker is an excellent choice... Unlike the other (integrated) programs, it is available for the vast number of 8-bit computers running the CP/M operating system as well as for the more powerful 16-bit computers."

—Michael J. Miller, 12/83

Everything in ONE Program.

Also for TANDY 1000 (128K)
and TANDY 1200 & 2000, IBM PC & PCjr.

Suggested Retail: **\$450**

Ask your local Radio Shack Center for more information or call:

T/Maker Company
2115 Landings Drive
Mountain View, CA 94043
415/962-0195

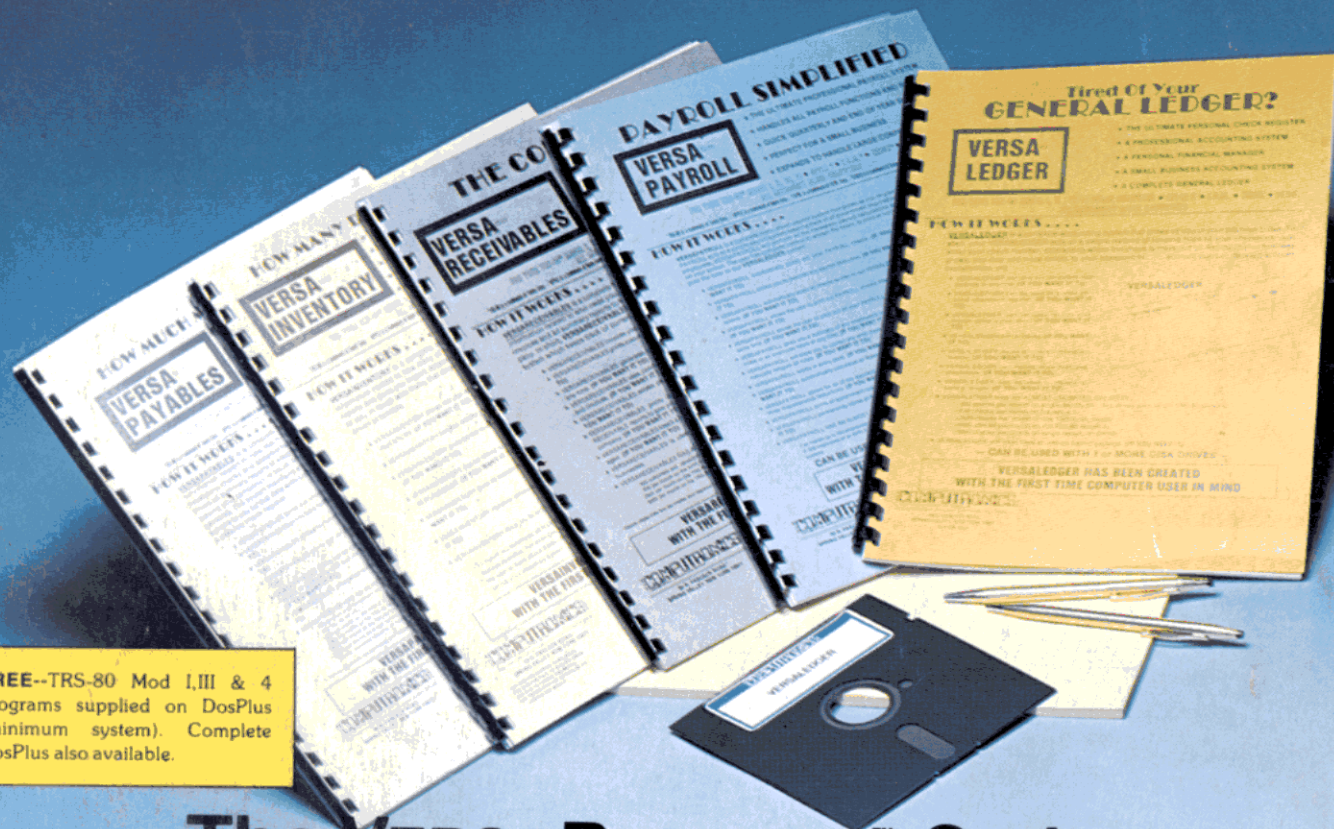
T/Maker™

Integrated Software

Word Processing
Spread Sheet Analysis
Relational Data Base Management
Spelling Checker
Bar Chart Graphics
Plus On Line Help

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

TRS-80 trademark Tandy Corp. - APPLE trademark Apple Corp. - IBM PC trademark IBM Corp. - OSBORNE trademark Osborne Corp. - XEROX trademark Xerox Corp. - KAYPRO trademark Non Linear Systems, Inc. - TELEVIDEO trademark Televideo Systems, Inc. - SANYO trademark Sanyo Corp. - NEC trademark NEC Corp. - DEC trademark Digital Equipment Corp. - ZENITH trademark Zenith Corp. - TI PROFESSIONAL COMPUTER trademark Texas Instruments, Inc. - SUPERBRAIN trademark Intertec Corp. - CP/M trademark Digital Research - EPSON trademark Epson Corp.