

Covering the TI99/4A and the Myarc 9640

# MICROpendium

Volume 6 Number 7

August 1989

\$2.00



**MAGNIFYING  
SPRITES**

See Page 9

## PLUS:

- ✓ The Portable TI — Part 3
- ✓ Help with TI-Writer
- ✓ 80-column screen editor with Forth
- ✓ News, reviews, hints and much more!

# Software



# Choose from our big selection of software for the TI-99/4A Computer.

Tex Comp continues to stock the world's largest selection of TI Software. The TI Software library on module, disk and cassette and is considered the best in the home computer software field. TI utilized the talents of such industry leaders as Scott Forsman, Milton Bradley, Microsoft Corp., Scott Adams, Addison Wesley Publishing, DLM, Milliken Publishing, Scholastic Inc., Imagic, Spinnaker and the list goes on and on.

## Home Management, Personal Finance, Education, Arcade-type games — all in the big TI Computer software library.

Tex-Comp purchased TI's inventory of these outstanding titles in order to continue its support of the TI-99/4A user

With its five warehouses and financial resources, Tex-Comp has been able to assure you, the TI-99/4A user continued support.

### HOME ENTERTAINMENT

MODULES		
PHM 3229 Nopper	4.95	
PHM 3023 Hunt The Mampus	4.95	
PHM 3052 Tombstone City	4.95	
PHM 3053 TI Invaders	4.95	
PHM 3054 Car Wars	4.95	
PHM 3057 Muncher	4.95	
PHM 3056 Alpiner	4.95	
PHM 3112 Paracac	4.95	
PHM 3031 The Attack	4.95	
PHM 3194 Jawbreaker II	5.95	
PHM 3110 Chisholm Trail	5.95	
PHM 3035 Hustle	6.95	
PHM 3037 Hangman	6.95	
PHM 3025 Mind Changers	8.95	
PHM 3036 Zero Zap	8.95	
PHM 3038 Connect Four	9.95	
PHM 3042T Tunnels of Doom (with disk)	9.95	
PHM 3042T Tunnels of Doom (with tape)	9.95	
PHM 3067 Othello	9.95	
PHM 3220 Microsurgeon	9.95	
PHM 3219 Super Demon Attack	9.95	
PHM 3222 Pathway	9.95	
PHM 3213 Burger Time	9.95	
PHM 3146 Munchmobile	11.95	
PHM 3197 Silymoids	15.95	

DISKETTE PROGRAMS		
PHM 5002 TI-TREK (TE-11 req. for speech)	4.95	
PHD 5010 Mystery Melody	4.95	
PHD 5015 Oldies But Goodies I	4.95	
PHD 5017 Oldies But Goodies II	4.95	
***SPECIAL Oldies But Goodies I & II	7.95	
PHD 5025 Sat. Night Bingo (Ex-Basic & Speech)	4.95	
PHD 5037 Draw Poker (Ex-Basic)	4.95	

CASSETTE PROGRAMS		
PHT 6002 TI-TREK (TE11 req. for speech)	4.95	
PHT 6010 Mystery Melody	4.95	
PHT 6015 Oldies But Goodies I	4.95	
PHT 6017 Oldies But Goodies II	4.95	
***SPECIAL Oldies But Goodies I & II	7.95	
PHT 6026 Sat. Night Bingo (Ex-Basic & Speech)	4.95	
PHT 6037 Draw Poker (Ex-Basic)	4.95	

ADVENTURES		
PHM 3041D Adventure Module & Pirate Adv. (disk)	6.95	
PHM 3041T Adventure Module & Pirate Adv. (tape)	6.95	
ADVENTURE SERIES (must be used with PHM 3041 module)		
Specify disk or tape with order		
Adventureland	4.95	
Mission Impossible	4.95	
Voodoo Castle	4.95	
The Count	4.95	
Strange Odyssey	4.95	
Mystery Fun House	4.95	
Pyramid of Doom	4.95	
Ghost Town	4.95	
Savage Island I & II (two adventures)	4.95	
Golden Voyage	4.95	
Knight Ironheart Adventure	4.95	
***SPECIAL-ALL ABOVE ADVENTURES ON DISK OR TAPE	17.95	
Spiderman Adventure	4.95	
Incredible Hulk Adventure	4.95	
Buckaroo Banzai Adventure (based on the movie)	4.95	
Sorcerer of Claymore Castle	4.95	
***SPECIAL-ALL OF THE ABOVE FOUR + HINT BOOK + TWO NEW ROMS ADVENTURES	17.95	
***SUPER ADVENTURE SPECIAL-BOTH OF THE ABOVE SPECIALS + COMPLETE HINT BOOK + ADVENTURE MODULE	29.95	
PHM 3185 Return to Pirate's Island (self contained adventure on module with graphics)	11.95	

### COMPUTER PROGRAMMING AIDS

MODULES		
PHM 3026 Original TI Extended Basic	39.95	
PHM 3055 Editor-Assembler	9.95	
PHM 3056 Mini-Memory (with Writer II)	12.95	

DISKETTE PROGRAMS		
PHD 5007 Teach Yourself 99/4A Basic	4.95	
PHD 5018 Teach Yourself Extended Basic	4.95	
PHD 5004 Programming Aids I	4.95	
PHD 5005 Programming Aids II	4.95	
PHD 5077 Programming Aids I, II, III	9.95	
PHD 5078 Beginning Basic Tutor	4.95	
PHD 5076 Text to Speech (Ex-Basic Speech)	4.95	
PHD 5098 TI Forth & manual (Ed/Assem req.)	19.95	
PHD 5078 TI Forth Demo Disk (Ed/Assem)	4.95	
PHD 5079 TI Forth Source Code (2 disks)	4.95	

CASSETTE PROGRAMS		
PHT 6006 Programming Aids I	4.95	
PHT 6007 Teach Yourself 99/4A Basic	4.95	
PHT 6018 Teach Yourself Extended Basic	4.95	
PHT 6067 Beginning Basic Tutor	4.95	

### EDUCATION

MODULES		
PHM 3002 Early Learning Fun	4.95	
PHM 3003 Beginning Grammar	4.95	
PHM 3010 Physical Fitness	4.95	
PHM 3020 Music Maker	9.95	
PHM 3004 Number Magic	9.95	
PHM 3021 Weight Control & Nutrition	10.95	
PHM 3109 TI Logo II (32K req.)	12.95	
PHM 3017 Early Reading (speech syn req.)	9.95	
PHM 3043 Reading Fun	9.95	
PHM 3046 Reading On	9.95	
PHM 3047 Reading Roundup	9.95	
PHM 3048 Reading Rally	9.95	
PHM 3028 Reading Flight	9.95	
PHM 3027 Addition & Subtraction I	9.95	
PHM 3028 Addition & Subtraction II	9.95	
PHM 3029 Multiplication I	9.95	
PHM 3049 Division I	9.95	
PHM 3051 Numeration II	9.95	
PHM 3061 Scholastic Spelling 5 (speech)	9.95	
PHM 3091 Milliken Subtraction	9.95	
PHM 3093 Milliken Division	9.95	
PHM 3094 Milliken Integers	9.95	
PHM 3098 Milliken Number Readiness	4.95	
PHM 3099 Milliken Laws of Arithmetic	4.95	
PHM 3101 Milliken Measurement of Formulas	4.95	
PHM 3114 Alligator Mix	6.95	
PHM 3115 Alien Addition	6.95	
PHM 3118 Minus Mission	6.95	
PHM 3127 Face Master	9.95	
PHM 3178 Story Machine	9.95	

DISKETTE PROGRAMS		
PHD 5009 Music Skills Trainer	4.95	
PHD 5011 Computer Music Box	4.95	
PHD 5018 Market Simulation	4.95	
PHD 5030 Speak & Spell II (Ex Basic req.)	9.95	
PHD 5011 Speak & Match (TE-11 req.)	4.95	
PHD 5042 Spell Writer (TE-11 req.)	4.95	
PHD 5026 Bridge Bidding I	4.95	
PHD 5039 Bridge Bidding II	4.95	
PHD 5041 Bridge Bidding III	4.95	
SPECIAL BRIDGE BIDDING I, II, III	4.95	
PHD 5070 Music Maker Demo (use with module)	4.95	
PHD 6010 Mystery Melody (w/oc the music quiz)	4.95	

### CASSETTE PROGRAMS\*

\*See disc versions for requirements i.e. TI-11

PHT 6009 Music Skills Trainer	4.95
PHT 6010 Mystery Melody	4.95
PHT 6011 Computer Music Box	4.95
PHT 6018 Market Simulation	4.95
PHM 3031 Speak & Match	4.95
PHT 6042 Spell Writer	4.95
PHT 6026 Bridge Bidding I	4.95
PHT 6039 Bridge Bidding II	4.95
PHT 6041 Bridge Bidding III	4.95
SPECIAL BRIDGE BIDDING I, II, III	4.95
PHT 6070 Music Maker Demo (use with module)	4.95

### MANAGEMENT AND BUSINESS

MODULES		
PHM 3006 Home Financial Decisions	4.95	
PHM 3007 Household Budget Management	4.95	
PHM 3022 Personal Real Estate	4.95	
PHM 3016 Tax/Investment Rec. Keeping (disk req.)	16.95	
PHM 3035 Terminal Emulator II	9.95	
PHM 3044 Personal Report Generator (PRK req.)	10.95	
PHM 3113 Multiplan	14.95	
PHM 3112 TI Writer	14.95	
PHM 3013 Personal Record Keeping	15.95	

### DISKETTE PROGRAMS

PHD 5001 Mailing List (upgraded version)	4.95
PHD 5003 Personal Financial Aids	4.95
PHD 5021 Checkbook Manager	4.95
PHD 5022 Finance Manager	4.95
PHD 5024 Inventory Management	4.95
PHD 5027 Invoice Management	4.95
PHD 5029 Cash Management	4.95
PHD 5038 Lease/Purchase Decisions	4.95
PHD 5075 TI/Multiplan upgrade disk	4.95

### CASSETTE PROGRAMS

PHT 6003 Personal Financial Aids	4.95
PHT 6036 Lease/Purchase Decisions	4.95

### TI-COUNT BUSINESS SOFTWARE NEW LOW PRICE!

**SPECIAL OFFER!!!**  
 General Ledger  
 Accounts Receivable  
 Accounts Payable  
 Inventory  
 Payroll  
 Mail System  
**ALL SIX PROGRAMS PLUS AUTO COUNT AUTO EXPENSE PROGRAM. \$89.95+s&h.**

### MATH AND ENGINEERING

specify disk or tape with order

Math Routine Library	4.95
Electrical Engineering Library	4.95
Graphing Package	4.95
Structural Engineering Library	4.95
AC Circuit Analysis	4.95

\*\*\*SPECIAL--ALL 5 OF THE ABOVE ON DISK OR TAPE---17.95



America's Number One TI computer retailer  
 P.O. Box 33084, Granada Hills, CA 91344

VISA & MASTERCARD  
 HOLDERS CALL DIRECT

VISA MasterCard  
**(818) 366-6631**

**24 HOURS A DAY**  
 7 Days a Week!

TERMS All prices FOB Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling (\$3.00 minimum). East of Mississippi, 4% free shipping on all software orders over \$100.00. COD to be paid by cash or certified check. All TI products are sold with the original manufacturer's guarantee only (sent on request). Prices and availability subject to change without notice. We reserve the right to limit quantities.  
 NOTE: Payment in full must accompany all orders. Credit Card, Company Check or Money Order for immediate shipment. Personal checks require up to 4 weeks to clear. California orders add 6% sales tax.



## Message from Tex-Comp

*Celebrating Our Tenth Year*

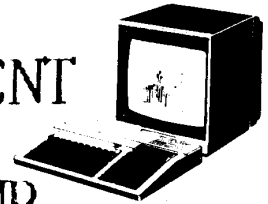
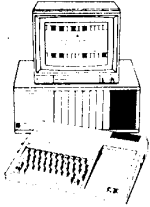
TEX-COMP BROUGHT YOU THE FIRST  
10 YEARS OF TI-99/4A

AND WE NOW PROUDLY PRESENT  
THE NEXT 10 YEARS.

THE ALL NEW 1990 TEX-COMP  
CATALOG & PRODUCT GUIDE.

OVER 55 PAGES DEVOTED  
EXCLUSIVELY TO THE TI-99/4A.

LOWER PRICES... MANY NEW PRODUCTS



TEN YEARS AGO TEXAS INSTRUMENTS CREATED QUITE A STIR AT ELECTRONIC SHOWS AND IN THE TRADE PRESS WHEN IT ANNOUNCED THAT IT WOULD BE BRINGING A HOME COMPUTER TO THE CONSUMER MARKET. IT IS HARD TO BELIEVE IN THESE DAYS OF PC AND MACS THAT TEN YEARS AGO THE ONLY COMPUTERS AVAILABLE (AND AFFORDABLE) FOR THE HOME AND SMALL BUSINESS MARKET WERE PRIMITIVE PIECES OF EQUIPMENT DESIGNED FOR SKILLED USERS. TEXAS INSTRUMENTS TOOK A DIFFERENT APPROACH AND DEVELOPED A POWERFUL COMPUTER AND ACCESSORIES THAT COULD BE SOLD TO NEW USERS WITH NO COMPUTER OR ELECTRONIC BACKGROUND. IN ADDITION TO DESIGNING A POWERFUL COMPUTER WITH A COLOR DISPLAY AND A 16 BIT PROCESSOR WHICH WERE UNHEARD OF IN THIS PRICE RANGE, TEXAS INSTRUMENTS ALSO CREATED A FANTASTIC LIBRARY OF MODULE, DISK AND CASSETTE SOFTWARE USING THE BEST NAMES IN THE BUSINESS. LOOKING AT THE TI SOFTWARE LIBRARY IS LIKE LOOKING AT THE WHO'S WHO OF COMPUTERS, EDUCATION, BUSINESS AND GAMES. NAMES LIKE MICROSOFT, MILLIKEN, SCOTT FORESMAN, IMAGIC, SCOTT ADAMS AND THE LIST GOES ON AND ON.

UNLIKE MANY OF ITS COMPETITORS, THE TI-99/4A HAS WITHSTOOD THE TEST OF TIME AND REMAINS THE OVERALL BEST VALUE IN PRICE AND PERFORMANCE IN THE SMALL COMPUTER FIELD. FOR THIS REASON THERE ARE STILL THOUSANDS OF THESE POWERFUL COMPUTERS IN USE AND SUPPORTED BY THIRD PARTY HARDWARE, SOFTWARE AND ACCESSORY FIRMS AND NATIONAL RETAILERS AND A MONTHLY MAGAZINE.

TEX-COMP IS PLEDGED TO THE CONTINUED SUPPORT OF THE TI-99/4A AS DEMONSTRATED BY PUBLISHING THE LARGEST 99/4A CATALOG EVER WITH MANY ALL NEW PRODUCTS IN ADDITION TO MANY OF THE ALL TIME BEST. WHATEVER YOUR PARTICULAR APPLICATION IS, THE ODDS ARE THAT YOU WILL FIND IT IN THIS CATALOG. YOU WILL FIND THE BEST AVAILABLE IN EDUCATION, BUSINESS, WORD PROCESSING, DATA BASE MANAGEMENT, GAMES, GRAPHICS AND TELECOMMUNICATIONS ALONG WITH THE BEST SELECTION AND PRICES IN PRINTERS, MODEMS, MONITORS AND EXPANSION HARDWARE. ALL OF US AT TEX-COMP ARE 99/4A USERS SO IT WON'T GO IN THE CATALOG UNLESS IT IS RIGHT. OUR REPUTATION DEPENDS ON THIS AND WE DON'T WANT TO MESS WITH A REPUTATION THAT TOOK US TEN YEARS TO BUILD!

TO RECEIVE THE 1990 TEX-COMP CATALOG & PRODUCT GUIDE, SEND \$2.00 TO TEX-COMP, P.O. BOX 33084, GRANADA HILLS, CA 91344. NOT ONLY WILL WE SEND YOU THE CATALOG BY FIRST CLASS MAIL, BUT WE WILL ALSO INCLUDE A \$5.00 CERTIFICATE YOU CAN USE ON YOU FIRST ORDER.

# Contents

## MICROpendium

**MICROpendium (ISSN 10432299) is published monthly for \$20 per year by Burns-Koloen Communications Inc., 16606 Terrace Dr., Austin, TX 78728-1156. Second-class postage paid at Austin, Texas, and additional mailing offices. POSTMASTER: Send address changes to MICROpendium, P.O. Box 1343, Round Rock, TX 78680-1343.**

No information published in the pages of MICROpendium may be used without permission of the publisher. Only computer user groups that have exchange agreements with MICROpendium may excerpt articles appearing in MICROpendium without prior approval.

While all efforts are directed at providing factual and true information in published articles, the publisher cannot accept responsibility for errors that appear in advertising or text appearing in MICROpendium. The inclusion of brand names in text does not constitute an endorsement of any product by the publisher. Statements published by MICROpendium which reflect erroneously on individuals, products or companies will be corrected upon contacting the publisher.

Unless the author specifies, letters will be treated as unconditionally assigned for publication, copyright purposes and use in any other publication or brochure and are subject to MICROpendium's unrestricted right to edit and comment.

Display advertising deadlines and rates are available upon request.

All correspondence should be mailed to MICROpendium at P.O. Box 1343, Round Rock, TX 78680. We cannot take responsibility for unsolicited manuscripts but will give consideration to anything sent to the above address. Manuscripts will be returned only if a self-addressed stamped envelope is included.

Foreign subscriptions are \$25.25 (Mexico); \$27.50 (Canada); \$25.00, surface mail to other countries; \$37 airmail to other countries.

All editions of MICROpendium are mailed from the Round Rock (Texas) Post Office.

Mailing address: P.O. Box 1343, Round Rock TX 78680

Telephone: (512) 255-1512

CompuServe: 75156,3270  
Delphi TI NET: MICROPENDIUM  
GENie: J.Koloen

**John Koloen.....Publisher**  
**Laura Burns.....Editor**

## Extended BASIC

Building magnified sprites.....Page 9

## Tips on using TI-Writer

Ways to avoid formatter problems.....Page 16

## Trials of a c99 beginner

Two more math functions.....Page 21

## The making of a portable TI

The final installment in the series, showing how the Myarc disk controller is the key to making the system work.....Page 28

## Character generator

The final installment of code for this assembly program to define and save CHARA1 files on the 4A and Geneve.....Page 34

## Forth

Another approach to a full-screen Forth editor.....Page 37

## Reviews

Chainlink.....Page 38

Personal Auditor Home Accounting System.....Page 39

Micro-reviews: Harrison Software Music Disks, Captions, Japanese Studies.....Page 40

## Newsbytes

Geneve developer package, some new fair information and the "Zenoboard".....Page 43

## User supported software

Programs from Ohio.....Page 44

## User Notes

Multiplan's VALUE-able function, why to reformat a hard disk, and the GRAM Kracker with SEB and E/A.....Page 45

## Classified

Page 47

### Programming conventions

Here are some tips to help you when entering programs from MICROpendium:

1. All BASIC and Extended BASIC programs are run through Checksum, the numbers that follow exclamation at the end of each program line. Do not enter these numbers or exclamation points. Checksum was published in the October 1987 edition.
2. Long XBASIC lines are entered by inputting until the screen stops accepting characters, pressing Enter, pressing FCTN REDO, cursoring to the end of the line and continuing input.

# THE INCREDIBLE SORTware

# TI SORT

Imagine the incredible. The ability to sort an unlimited amount of data, stored in virtually any type of file, in record time. Imagination just became reality, the incredible is TI Sort.

Based on the "Quick Sort" method developed by C.A.R. Hoare, TI Sort is the only universal sorting utility available for the TI-99/4a. Its fast, powerful, and easy-to-use. TI Sort can handle an unlimited amount of data (records), stored in almost any file format. TI Base files, delimited files, fixed length files, and Basic or Extended Basic files -- TI Sort does them all!

### Sample Time Trial

Program	Device		
	Floppy	RAMdisk	Hard Disk
TI Sort	8:59	1:59	2:20
TI Base	3:47:26	13:26	13:47

**Sort Type:** 2 field nested sort. (TI Sort can sort up to 8 fields)  
**File Type:** Standard TI Base file.  
**File Size:** 843 records; 80 characters per record in five fields.  
**Equipment Used:** Standard TI-99/4a console attached to a peripheral expansion box containing a Myarc hard/floppy controller, two 6ms DS/DD floppy drives, 20 megabyte hard disk, and a Myarc 512K memory expansion card.

The table speaks for itself -- no hype, no miraculous claims. There is no faster. Period.

### TI Sort - The Incredible SORTware - Only \$14.95

TI Sort requires a disk system, 32K memory expansion, and either an Extended Basic, Editor/Assembler, or Mini Memory cartridge. TI Sort is fully compatible with all storage devices and the Geneve 9640 (in GPL mode).

## TI BASE Version 2.0

With its overwhelming file handling capabilities, extensive command programming language, and unmatched information processing facilities, TI Base is the most advanced and flexible database management system available for the TI-99/4a.

- File Handling; supports up to 5 active databases of 16129 records, with 17 fields per record, and 255 characters per field.
- Command Language; powerful procedural language consisting of 45 commands similar to those used by Ashton-Tate in dBASE.
- Unmatched Features; full database and record manipulation, formatted display and print capabilities, math functions, sort, global record processing, disk management, 40 column editor, plus more!

**TI Base Complete - Only \$24.95**

## MICROdex FOR TI BASE

MICROdex is a fast, easy-to-use, publication indexing system that places an enormous amount of information at your fingertips. Any article, program review, or editorial that has appeared in many TI-related publications can be quickly located by subject, source, or type. Menu-driven TI Base command files are included with each MICROdex that allow you to access the information stored in the publication databases.

**MICROdex Volume I**, a four disk set, indexes information from MICROpendium, Computel Magazine, 99er Magazine, and HCM. **Only \$14.95**

**MICROdex Volume II**, a two disk set, indexes Byte, Computer Shopper, Creative Computing, Enthusiast 99, Family Computing, Mini Mag 99, Popular Computing, R/D Tech News, Super 99 Monthly, and The Smart Programmer. **Only \$9.95**

**Order both Volumes I and II for only \$22.95!**

### TEXAMENTS

**Office:(516)475-3480 53 Center Street, Patchogue, NY 11772 BBS:(516)475-6463**

Please add \$2.50 for domestic first class and Canadian delivery, \$8.00 for foreign insured air mail delivery. Sorry, no credit card orders will be accepted. C.O.D. orders are accepted, and must be placed by phone. Orders are usually shipped within 48 hours.

# Comments

## Extend subscriptions to save money

Good news and bad news. The bad news first.

There's no more escaping it: The subscription price of MICROpendium is going up starting Oct. 15. All subscription categories will increase by \$5 per year starting on that date. That means a standard, domestic subscription will increase from the current \$20 per year to \$25 per year. Canadian subscriptions will go from \$27.50 to \$32.50. And foreign air and surface subscribers can add \$5 to their current rate.

We have to do this in order to keep publishing 48 pages a month. In the past we've cut the number of pages down to 40 during the summer, but we've remained at 48 this year. Our intention is to remain at 48, but it costs more. Our printing costs have increased, as well as other overhead items. The last subscription increase was in September 1987.

Bulk purchasers will also be paying 25 cents more per copy. The cover price will increase to \$2.50. These prices will go into effect with the October edition. (Bulk purchasers who prepaid their orders a year in advance won't be rebilled at the new rate.)

Now for the good news.

Readers may extend their current subscriptions for 12 months at the current rates as long as we receive the check before Oct. 15. Please, don't try to renew for more than a year because we can't keep publishing 48 pages if we can't afford to pay the printer.

### TENEX PLANS CATALOG

Tenex is including some TI products in its catalog published in August. However, it's nothing like the collection of TI products in previous Tenex catalogs. Last month I predicted there wouldn't be another Tenex catalog for the TI. I'd like to see the company remain in the TI market, even if in only a small way.

### FLU TAKES TOLL ON REGENA

BASIC columnist Regena took August off, with the flu. Not much of a vacation for her, unfortunately. Her column will continue in September.

### TIW FORMATTER AND LASER PRINTERS

Here's the problem: Running TI-Writer with a laser printer so that documents don't automatically advance at the top of the page. A reader asks if there is a way to run the formatter so that each page starts with the first line. Using a page break causes the top-of-form advance on the subsequent page and he wants to use the entire page for copy. I've scanned our User Notes but haven't found a solution to the problem. A user note would be appreciated.

### THOUGHTS ON ADVANCED BASIC

A final version of Advanced BASIC is still around the corner. Since it runs only with MDOS .95, which is incompatible with the Myarc Disk Manager, it can't be used with a hard disk. I've used both but I run them out of floppies (with the hard-disk turned off), just to be on the safe side. There aren't many Advanced BASIC programs out there — the one I've used is Jim Uzzell's Appointment Scheduler — but it is obvious that Advanced BASIC is much more powerful than Extended BASIC or Super Extended BASIC. The graphics, especially, are way beyond anything we've seen on the TI.

Unfortunately, there are no firm dates for final versions of Ad-

vanced BASIC, MDOS or Pascal Runtime.

Most of the questions we have for the Myarc Q&A column have to do with the specifics of Advanced BASIC, MDOS, and Geneve hardware. The problem with trying to answer the questions is that software specifications aren't finalized. So, an answer that is correct for one version may not hold when subsequent versions are available. Advanced BASIC is an example. The current beta test versions of the program in a number of ways do not reflect the documentation that came out with the Geneve. Readers who have written programs based on the manual tell me that they won't run with the real-world Advanced BASIC without modification. And, of course, the beta test versions don't come with updated manuals. A lot of time is thus wasted on trial and error as users discover the actual capabilities of the software. Not until there are finalized versions of Advanced BASIC and MDOS will software development really get under way. And the sooner that happens, the better.

—JK

## UPCOMING TI FAIRS

### SEPTEMBER

**Central Illinois Computerfest** Sept. 9 at Decatur Civic Center, Decatur, Illinois. For further information, call Helen Logan (217) 429-1809 or Jim Haws (217) 963-2607.

**Gregg County Fair**, Sept. 12-17 in Longview, Texas. Longview Computer Users Group to sponsor booth. For information, contact Leo W. DuBry, DuBry's Photography, 325 S. Center St., Longview, TX 75601.

**TI International Expo 89** Sept. 16 at Howard Johnson Inn, 5821 Richmond Highway, Alexandria, Virginia. For further information write Mid-Atlantic Ninety-Niners, TI International Expo 89, P.O. Box 4005, Rockville, MD 20850. (301) 340-7179; or Delphi TI-NET, Teledata; or CompuServe, 74405.1207.

**Fourth Annual TI99/4A Seattle Convention**, Sept. 23-24 at Kenmore Fica Market in Kenmore, Washington. For further information contact Barb Wiederhold, (206) 361-0799 (voice) or (206) 361-0895.

### OCTOBER

**Fourth European Tref**, begins at 10 a.m. Oct. 7 at Kolpinghuis, Nijmegen, The Netherlands. For information, contact Vereniging TI-Gebruikersgroep, Secretariaat: Dr. E.C. van Wette, Kremersmaten 106, 7511 LC Enschede, The Netherlands.

**Australia TI Fair**, 2-6 p.m. Oct. 14, Pavilion, Deepdene Park, Whitehorse Rd., Deepdene, Australia. For information contact TI99/4A Users Group — Melbourne Inc., 88 Main St., Blackburn, Victoria 3130, Australia.

**3rd International TI-Users Meeting**, 10 a.m.-6 p.m. Oct. 15 at Jugendherberge Duisberg Wedau, Kalkweg 148, 4100 Duisberg 48, West Germany. For information contact TI-99er Workshop Rheinland, Dept. Allgemein & Software, c/o Mike Heuser, Karl-Marx-Allee 18, 5000 Cologne 71, West Germany, or the organizing committee at PCC, TI-Service, c/o Hans Greiffenberg, Großglocknerstr. 45, D-4100 Duisberg 28., West Germany.

**Third Annual CPUG Computer Expo**, 7 a.m.-2 p.m. Oct. 15 at Carlisle Fairgrounds on Clay Street in Carlisle, Pennsylvania. Sponsored by Central Pennsylvania 99/4A Users Group, co-sponsored by Cumberland County Amateur Radio Service and 6th Annual Cumberland County Hamfest. For information, contact Central Pennsylvania 99/4A Users Group, P.O. Box 14126, Harrisburg, PA 17104-0126 or the WIZ/TIB BBS, (717) 657-4992 or 657-4997.

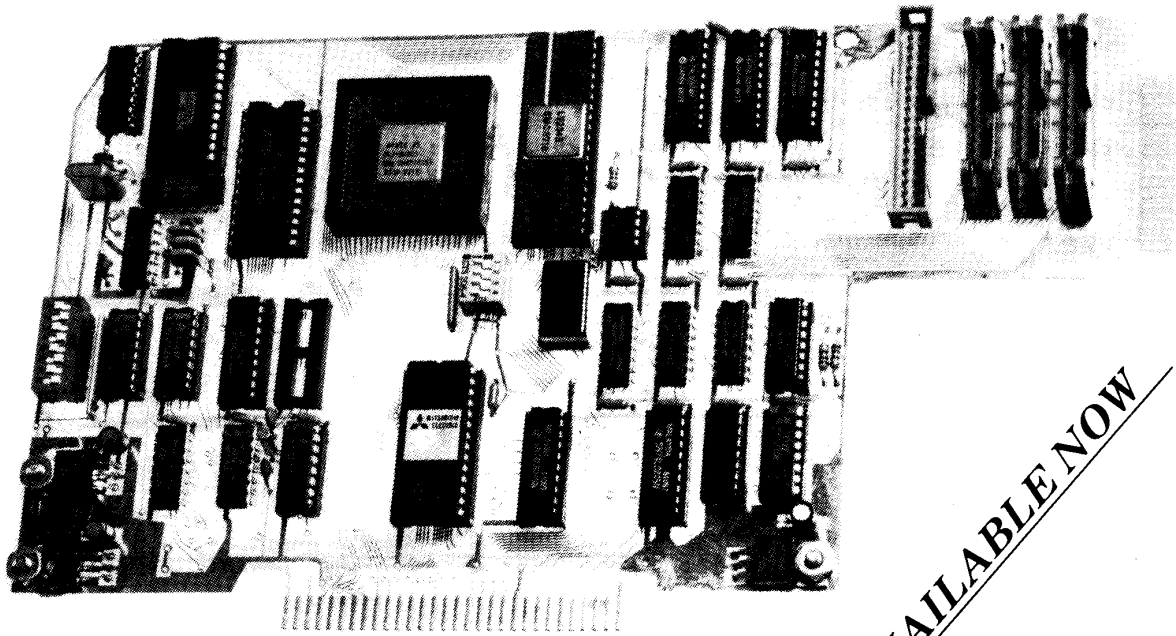
### NOVEMBER

**Chicago TI-Faire**, 9 a.m.-5 p.m. Nov. 4 at Holiday Inn, 3505 Algonquin Rd., Rolling Meadows, Illinois. Social evening Nov. 3, dinner evening of Nov. 4. Sponsored by Chicago Area TI99/4A Users Group. For information contact Sandy Bartels, Chicago Area TI99/4A Users Group, P.O. Box 578341, Chicago, IL 60657 or (312) 859-3850.

**Milwaukee TI-Faire**, 9 a.m.-5 p.m. Nov. 5 at Quality Inn, 5311 S. Howell Ave., Milwaukee, Wisconsin (across from Mitchell Field Airport). For information call Gene Hitz, 4122 N. Glenway, Milwaukee, WI 53222 or (414) 535-0133.

This TI event listing is a permanent feature of MICROpendium. User groups and others planning events for TI/Geneve users may send information for inclusion in this standing column. When space is available, events will remain listed throughout the year for reference for the coming year.

## THE MYARC Hard & Floppy Disk Controller with Streamer Tape Backup Support



**AVAILABLE NOW**

### Features include:

- Hard drive transfer rate of 5Mbit per second, for speed comparable to an external RAM disk card
- Interfaces with standard, off the shelf, hard, floppy and streamer tape drives
- Built-in real time clock, for time and date stamping of files
- Supports up to four 5 1/4" and/or 3 1/2" floppy drives, mix or match
- All disk formats, SS/SD (90K), DS/DD (320/360K) and DS/QD (640/720K) supported
- MYARC Disk Manager V, the most intuitive and user friendly manager available
- One year limited warranty, 12 months parts, 6 months labor, is standard, an optional two, three or four year extended warranty is available

# Feedback

## On hardware voltage

The software I have ordered from the USA is pretty straightforward and works flawlessly, but I've been wary of purchasing hardware because of the different voltages.

I wonder if you could advise sometime how I would go on for repairs and whether some of the hardware is easy to convert. I was thinking of standalones and not items for the PEB.

**D.H. Caine  
Crewe, England**

*We would appreciate hearing from anyone who has experience in this. — Ed.*

## Manufacturer replies

In the January 1989 MICROpendium review of Picture-It, Ken Gilliland addresses a concern when defining several instances in the same session. He stated that the "preceding Instances sometimes contain errors." Ken was working with an early copy. The error mentioned was corrected early in 1988 in version 1.3.

My thanks to Harry Brashear for his March '89 mini-review of Form Shop and to Bill Gaskill for his June '89 full review. Both presented fair overviews of the product. They are correct that the documentation does not include TI-Writer information. A working knowledge of TI-Writer is necessary for full use of Form Shop. I was happily surprised to discover that it compares so favorably to similar IBM software.

Regarding printer compatibility, everyone seems to know that Form Shop prints using the IBM character mode found in newer printers. I would like to point out that Form Shop can utilize the block characters of the Gemini 10x and the Epson graphics mode found in almost all printers.

Users seem to overlook note 2 in the documentation. Forms printed using the IBM or Gemini 10x character sets need not have a line feed at the end of each line and may be printed by the TI-Writer formatter using "PIO.LF". For this reason, I left the default "PIO.LF". Forms using the Epson graphics (SETUPALL) must use "PIO.CR".

If you wish to purchase Form Shop, but

your printer does not use IBM characters or Epson graphics, a setup file can be custom-made for your printer for a nominal charge.

**Rodger Merritt  
Comprodine  
Fullerton, California**

## Not running in circles

From the merits of Gary Cox's review of the NX-1000 Star Printer (March 1989), I purchased my first printer for my TI99/4A. My enthusiasm slowly diminished as weeks went by with no output to the printer. I tried everything I could think of — only the printer's self-test would work. Presuming my new star printer was entirely compatible with the TI99 (why would they advertise and sell a printer in a catalog that specializes in TI hardware and software that wasn't compatible?), I looked for problems elsewhere.

My Multi-Com interface (from Triton products) wouldn't self test, so I shipped it back to Triton for tests. I wrote a letter to Asgard, suspecting that perhaps their software I was using was not compatible with the Multi-Com interface.

Lo and behold, in the July Feedback was the solution to my problem! The follow-up on the NX-1000 by Gary Cox! He said later versions of the NX-1000 are *not* compatible with the TI99/4A due to a quirk in the EPROM chip — my printer version is 2.1.

I called Star in Piscataway, New Jersey (on purchaser's record card) — no help — they referred me to the California number. Their 800 number (national technical support was disconnected). I called their 900 number and talked to "Jim" who said they were well aware of the problem and are in the process of developing a fix in the EPROM chip for the 2.1 version. This may come in a week or two — I'm to call back — and when the fix is ready, I'm to ship my EPROM to them in California, first, before they'll ship me the modified chip. This could go on another month!

My thanks to Gary Cox and MICROpendium. I'd still be going around in circles — now I see a solution, I hope.

**Raymond C. Kiesling  
Brookhaven, Pennsylvania**

## XBASIC problems

I have a silver and black pre-1983 console, P-Box with TI Disk Controller, two Teac half-height drives, TI RS232 and CorComp 32K memory. This system works fine in console BASIC and with most cartridges, including TI-Writer. My problem is that the system goes bonkers when attempting to use XBASIC (either TI's or Super). Sometimes the system will not start up at all when the XBASIC cartridge is inserted or when XBASIC is selected, or it might start but not complete the initial autoloading, or it might complete the autoloading, load the selected program from disk, start to run it and then freeze.

I have cleaned the contacts on the module.

I have since bought a slightly used pre-1983 console and tried it with my system. Results? No better. I replaced the RF Modulator with the one received with the new console with some improvement (in fact, last night was the first time I saw a third selection on the Super XBASIC menu), but I'm far from ready to say that the RF Modulator is the solution. I still have problems at times when I first power up. Sometimes, all I get is the selection for TI BASIC even with the XBASIC module in place. In fact, to some degree, the sickness had spread to TI-Writer. Is there any chance that CorComp memory or the connections to the P-Box could be causing the problems?

**R.W. Walter  
Glen Carbon, Illinois**

**Since the problem has been repeated on two consoles, and seem to be spreading, you need to look beyond cleaning the cartridge GROM contacts. You may need to replace the console GROM port. (See User Notes in this issue for an article on console fixes.) Try running the cartridges without the PEB turned on. If they work properly without the PEB, try running them with the PEB on but without expansion memory, etc. Make notes about the configurations that work and don't work. Through the process of elimination you may be able to isolate a cause. Readers with suggestions are encouraged to submit a user note. — Ed**



## EXTENDED BASIC

# Building magnified sprites

By **JERRY L. STERN**

©J.L. Stern

Time to go back to school. Time to hit the books again, and get back to work. How depressing. The thought of going back indoors and sitting down to drudgery just doesn't appeal to me. Those drab, colorless halls and rooms, the dull, boring studying. I know that it could be just too much, unless. Yes, I suppose I could sneak some computer games into my worktime. Maybe something with lots of graphics. Big, bright graphics. Or maybe even big, moving graphics! Some sprite graphics would certainly brighten up some of that dull, boring workload.

Of course, defining sprite shapes could quickly become work. Let's see, one character on and three off; that's an eight. For big graphics I'll need big sprites; those are defined with four consecutive character patterns. That's 4 times 16, or 64 hexadecimal digits to figure out for each magnified sprite. This is getting depressing. One of my supposedly fun projects led me to manually calculate 39 different sprite shapes. By hand. Never again.

While searching for a program to calculate that hexadecimal mess, I came across the program called Character Definition in the TI User's Reference Manual. This was some years ago, back in the days of programs on cassettes and Bill Cosby doing television ads for something besides Jell-O. There was no commercial software available. Or shareware, or freeware. The Character Definition program wasn't all that bad. (It starts on page III-26 of the manual, if you want to take a look.) It was written in console BASIC, and so had no DISPLAY AT, or sprites, or any need to define more than one character at a time.

A magnified sprite needs not one, but four characters redefined. There just is no way to attempt that with the old TI pro-

gram. SPRITE BUILDER started out as my way of expanding Character Definition so that it could handle four characters together, in Extended BASIC. It quickly grew beyond any but the remotest similarity in screen layout. I found a way to calculate how a sprite pattern changes when it is turned on its side, or reversed in colors, or flipped left to right. When I got my PEB and printer, I added the capability to convert the TI codes to Epson printer codes. While doing a large project, I found that even printouts weren't enough; I wanted to save the sprite shapes to disk files. That was added. Finally, here is the program that has been evolving for six years. SPRITE BUILDER as seen here now can do a graphics screen dump in addition to its previous abilities.

---

**Finally, here is the program that has been evolving for six years. SPRITE BUILDER as seen here now can do a graphics screen dump in addition to its previous abilities.**

---

I won't pretend that a program that has gone through as many changes as this one is perfectly structured. It isn't, but the seven subprograms help to keep it from getting completely entangled in itself. Most recently, when I added the screen dump facility, the same dump as published here in the June MICROpendium, I only had to MERGE in the subprogram and change about three lines to add the new feature. Without subprograms, these changes would have been far too difficult to make over the years.

Let's look at the subprograms first. The main program will tie these chunks

together into a whole unit. Each of the subprograms can be used in other projects, of course, and have been.

**DUMP3 and CHARPRT:** This graphics screen dump routine was published in the June MICROpendium. It prints out the screen image as defined by the current character patterns stored in the TI character table for each ASCII character. This is a slightly changed version.

DUMP3 was designed for use where character definitions would remain unchanged between calls of the subprogram. Except for four characters, this is true here, too. Those four characters, ASCII numbers 132 to 135, are used to display the modified shapes created in the main program. The new line 28283 resets those four characters in the patterns list in DUMP3. That makes this subprogram call the subprogram CHARPRT to recalculate the Epson codes for those characters every time the screen dump is used. Because it must convert all the character codes on the screen, DUMP3 takes far more time to run the first time it is called than on subsequent passes.

However, the screen dump is not the only way to print out a character. Option 9 in the main menu will also print out the character pattern, as well as the EPSON codes needed to print it out, and a sample picture of the character.

**SUBBER:** Option 9 can also save the character to a disk file using the subprogram SUBBER. This routine creates a file of character patterns. Each pattern is saved as one DATA statement in a merge format program file. Effectively, SUBBER is a subprogram that creates other program portions. Each time SUBBER is called, it will save an additional line to the same disk file. This file of statements will begin at line 20000, but you can change that initial setting if you like, in line 150 of the main

(See Page 10)

# EXTENDED BASIC—

(Continued from Page 9)

program.

One warning about SUBBER: It does not complete its own file. That must be done by the main program. SPRITE BUILDER does that in line 740. Leave the disk in place until SPRITE BUILDER has returned control to Extended BASIC immediate mode. The program will print the end of file marker to the data file and then end the program. This technique is the reason that only one data file can be opened in each run of the program.

**HD:** This is the subprogram that prints out the large header picture of the new character when the Option 9 print routine is used. This is done very simply. For each dot in the character pattern, one dark block is printed, eight dots wide and seven dots high. Eight dots high would create a square, but not all of the TI and Epson compatible printers will print graphics codes above 127, or seven dots high. Rather, they could print them, but that involves flipping one DIP switch inside the printer and changing the printer name from "RS232.BA=\_\_\_" to "RS232.BA=\_\_\_DA=8" That option sends eight data bits to the printer instead of seven. If you have the original printer, it's worthwhile — make the change!

There is one tricky bit to HD. The dots in the TI pattern are in a top to bottom and again top to bottom pattern in each of the four character patterns. HD corrects this by printing the 1st, 2nd, 17th, and 18th characters of the hexadecimal code on it's first pass, then coming back for the 3rd, 4th, 19th, and 20th, and so on.

**WAIT and PAUSE:** These are very simple subprograms that take functions that are needed in almost every application program, and standardize them, make them easier to type in. I just merge them in, and I'm done. I keep a file of subprograms just for this purpose, and it saves me an enormous amount of time on each project.

**MG:** This subprogram magnifies sprite patterns from single character size, or magnifications one and two, to quad size, or magnifications three and four. This is useful for making letters for display in programs for kids learning to read, or for anyone who may need large letters on the screen because of vision

SPRITE BUILDER

```

0123456789ABCDEF
0704 0707 0707 0700
0F06 3F26 2606 0910
FF11 7B7B 7B71 FF20
2020 E000 0000 0080
P R E S S   R   T O   R E P E A T :   P   P R I N T
    
```

Screen dump of character definitions created with SPRITE BUILDER.

problems.

In magnification level two, sprites of single letters and numbers are two columns wide and two rows wide. By expanding the shape of that letter to a quad-sized sprite, with it's 64-digit hexadecimal code, it can be displayed in magnification level four as a letter four columns wide by four rows high. That's 16 times the size of normal screen letters.

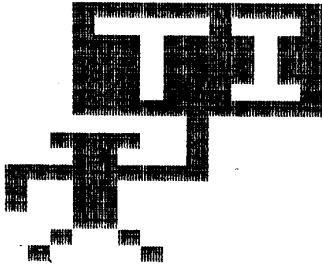
The conversion process is similar to that of the HD subprogram. Each digit of the single size sprite code is converted to four digits in the new quad size sprite. If the first digit of the old code is 1, for example, the first four digits of the new code will 0303. Each digit represents four dots in a row straight across. The rightmost dot alone is 1. The next dot is 2. Both combined, both dots turned "on," is three. So, if the old code was 1, or:

OFF OFF OFF ON

then the new code must be: 0303

OFF OFF OFF OFF OFF OFF ON ON

(See Page 12)



TI SIGN HOLDER

0704	0707	0707	0700	0	0	0	0	0	254	190	190
0F06	3F26	2606	0910	130	190	191	254	186	130	186	254
FF11	7B7B	7B71	FF20	0	0	56	33	162	252	252	162
2020	E000	0000	0080	33	32	224	0	0	0	0	0

A second type of printed record of character patterns created by SPRITE BUILDER.

**MAJOR SOFTWARE RELEASE FOR THE GENEVE**



**GENPROG**



**PROGRAM DEVELOPMENT PACKAGE**

BY PAUL CHARLTON

You've read about it and heard about it, now this long awaited Developers Package is available in limited release!  
 GENPROG contains programs that run in the MDOS mode:

- \* GENASM macro assembler - Code development for 99/4A and MDOS applications.  
Great for C99 programmers!
- \* GENLINK linker - Supports full code libraries. Develop 99/4A and MDOS applications.
- \* GENLIB librarian - Allows easy interactive maintenance of code libraries for the linker.
- \* LIBRARIES - for 99/4A and MDOS programmers, with commonly used routines.
- \* GENMAKE make utility - Allows an author to easily keep track of file dependencies in programs and large documents.
- \* GENREF - MDOS programming environment documentation.

**LIMITED RELEASE NOW AVAILABLE:**

Due to the high demand for this program package we will ship GENPROG. However, GENREF documentation can't be completed until a stable MDOS is available. No estimated release date can be given. Therefore, at YOUR option, we will ship or hold your order. You will NOT be billed if we hold your credit card order. Note the pricing structure for the packages:

**PACKAGE 1:**

GENASM, GENLINK, GENLIB, LIBRARIES and GENMAKE. GENREF to be shipped upon completion: \$74.95 cash or check - \$79.95 credit cards - Shipping \$5.00

**PACKAGE 2:**

GENASM, GENLINK, GENLIB, LIBRARIES, GENMAKE and GENREF. Orders held, then shipped upon completion of GENREF: \$69.95 cash or check - \$74.95 credit cards - Shipping \$5.00

**\*\*\* GENPROG COMPANION PACKAGE \*\*\***

**JUMBOOT 2.0**

HARD DISK PERFORMANCE FROM A FLOPPY

Fast-Boot MDOS on your Geneve in 4.5 seconds with a Myarc or CorComp disk controller and up to 9.0 seconds with a TI controller !!

	JUMBOOT 2.0	Regular Price	With GENPROG Purchase \$
-- Frees 90K of RAM on RAMdisks for your GENPROG programs !	‡ 5.25 Single Sided, Single Density .....	\$15.95	\$11.95
-- Increases loading speed for programs under MDOS or GPL. Perfect for GENPROG !!	‡ 5.25 Double Sided, Double Density .....	\$15.95	\$11.95
	‡ 5.25 Double Sided, Single Density .....	\$15.95	\$11.95
-- Permits painless cold booting for program developers. Great with GENPROG !	‡ 5.25 80 Track, Quad Density .....	\$18.95	\$15.95
	‡ 3.5 80 Track, Quad Density .....	\$19.95	\$16.95
	‡ Jumpboot 2.0 delivered when your GENPROG package is shipped.		
	Add \$2.00 shipping if JB2 is NOT ordered with GENPROG.		

ORDER GENPROG AND JUMBOOT NOW !

Disk Only Software  
 P.O. Box 244  
 Lorton, VA 22079

Credit Card Orders: 1-800-736-4951  
 Toll free now available in Canada!  
 Delphi: DOS - CompuServe: 74405,1207



## EXTENDED BASIC—

(Continued from Page 10)

OFF OFF OFF OFF OFF OFF ON ON.

Again, the digits have to be converted in a different order than the original. First all the odd digits are expanded, and then all the even digits get the same treatment. That keeps all the proper dots in the same positions.

That covers all the subprograms; now let's look at the main program. SPRITE BUILDER stores the dot pattern being designed in a pair of arrays, B(16,16) and BB(16,16). These arrays are usually equal to each other. B is used as the primary array for the shape, and BB is used for turning the shape. The turn option of the main menu works by copying the contents of B into BB with columns and rows reversed, and then copying the result back to B again.

The other options are:

**No. 1:** Any Character — Quad Size. (Lines 320 to 330.) This uses the MG subprogram to magnify the existing shape of any of the ASCII characters available on the keyboard.

**No. 2:** Any Character — Single Size. (Lines 320 to 330, same as option 1.) This can be any character on the keyboard again, but in it's original size, and appearing in the upper left corner of the quad size shape display.

**No. 3:** Magnify an Old Pattern. (Lines 340 to 360.) This will allow a 16-character, or single size sprite code, to be typed in.

MG will be used to expand it to quad size.

**No. 4:** Old Pattern — Unmagnified. (Lines 340 to 360, as in option 3.) The starting point will be typed in as a 64-digit quad sprite.

**No. 5:** New Character. (Line 370) Just a blank screen to fill as you choose. These first five options are starting points for new characters. The remaining options are for manipulating or saving or printing characters already worked with.

**No. 6:** Reverse Former Character. (Lines 310 to 330.) This one reverses the light and dark dots of the shape.

**No. 7:** Turn Former Character. (Line 290) The character is rotated ninety degrees in a counterclockwise direction. Turn again for upside down sprites, or twice more for 270 degree turns.

**No. 8:** Flip Former Character. (Line 300) This is a left to right reversal, or mirror image, of the original shape, as compared to number 7 performed twice, which is just upside down.

A top to bottom mirror image reversal can be done as well. Turn the image once with option 7, flip with option 8, and then turn with option 7 until the shape is facing in the correct direction.

**No. 9:** Print/Save Former Character. (Lines 850 to 1170) We've already looked at these routines, but a comment for those with non-Epson compatible printers. The screen dump will not work for you. You

can, however, print the hexadecimal code to your printer. Use option 9, and answer "No" to the question "Print Sprite Pattern?" And for everybody with a printer, change the default in line 90 to match the name of your printer.

When using the "Save" option, SPRITE BUILDER creates a file containing the character definitions in DATA statements in a MERGE file. To use that file, first make room starting at line 20000 in your program. You may need to resequence to move the lines around, or change line 150 of SPRITE BUILDER to use a different value for LN, the starting line number of the DATA file. Once you've made sure the line numbers of the DATA file and your new program don't overlap, just combine the files with the merge command.

OLD DSKI.NEWPROJECT  
MERGE DSKI.CHARFILE

That should make your new project ready for testing.

Well, I had better let you get started. Adding sprites to your programs should be enough to keep you going through the fall school season, but in case it isn't, try designing your own falling leaves sprites and falling snowflakes sprites. They're perfect for seasonal greetings programs for your fellow TT'ers. Whew! I see the holiday season is starting early again this year.

## SPRITE BUILDER

```

90 P$="RS232.DA=8.BA=4800" !
041
100 ! SPRITEBUILDER V. 4.0 J
LS 8/89 !216
110 CALL SCREEN(12):: CALL M
AGNIFY(4):: ON BREAK NEXT ::
ON WARNING NEXT !194
120 DATA 0,0,0,0,0,0,0,1,0,0
,1,0,0,0,1,1,0,1,0,0,0,1,0,1
,0,1,1,0,0,1,1,1 !108
130 CALL CHAR(128,"1F3067444
467301FF0180C04040C18F000FF"
,138,"0",139,"0"):: CALL CLE
AR :: !052
140 DISPLAY AT(1,7)ERASE ALL
:"SPRITE BUILDER" :: CALL CH
AR(95,"00FF"):: CALL HCHAR(2
,9,95,14)!099
150 CALL WAIT :: LN=20000 !0
55

```

```

160 DIM B(16,16),BB(16,16),P
(16,4),TT(64)!084
170 CALL CHAR(136,"FEFEC6061
E380038010139F9E1C7FFC7",139
,"FFFFFFFFFFFFFFFF")!060180
CALL COLOR(14,2,16):: HX$="0
123456789ABCDEF" :: M$,K$=RP
T$("0",64)!148
190 DATA 1,0,0,0,1,0,0,1,1,0
,1,0,1,0,1,1,1,1,0,0,1,1,0,1
,1,1,1,0,1,1,1,1 !116
200 FOR L=0 TO 15 :: FOR M=1
TO 4 :: READ P(L,M):: NEXT
M :: NEXT L !028
210 IF Q=2 THEN M$=SEG$(M$,1
,16)!180
220 DISPLAY AT(1,7)ERASE ALL
:"SPRITE BUILDER" :: CALL HC
HAR(2,9,95,14)!075
230 CALL DELSPRITE(#1):: DIS

```

```

PLAY AT(3,1):"Choose a start
ing point::" : "1 -ANY CHARAC
TER - QUAD SIZE" !129
240 DISPLAY AT(6,1):"2 -ANY
CHARACTER-SINGLE SIZE": "3 -M
AGNIFY AN OLD PATTERN": "4 -O
LD PATTERN-UNMAGNIFIED" !053
250 DISPLAY AT(9,1):"5 -NEW
CHARACTER": "6 -REVERSE FORME
R CHARACTER (WHITE ON BLAC
K)": "7 -TURN FORMER CHARACTE
R" !153
260 DISPLAY AT(13,1):" (TUR
N COUNTERCLOCKWISE)": "8 -FLI
P FORMER CHARACTER": " (RIG
T TO LEFT)": "9 -PRINT/SAVE F
ORMER CHAR.": "0 -QUIT" !084
270 CALL KEY(3,Q,S):: IF S<1
THEN 270 ELSE IF Q<48 OR Q
(See Page 13)

```

## EXTENDED BASIC—

(Continued from Page 12)

```

57 THEN 270 ELSE Q=Q-48 !011
280 ON Q+1 GOTO 720,320,320,
340,340,370,310,290,300,860
!169
290 CALL WAIT :: FOR R=1 TO
16 :: FOR C=1 TO 16 :: BB(C,
R)=B(R,17-C):: NEXT C :: NEX
T R :: FOR R=1 TO 16 :: FOR
C=1 TO 16 :: B(R,C)=BB(R,C):
: NEXT C :: NEXT R :: GOTO 3
80 !020
300 CALL WAIT :: FOR R=1 TO
16 :: FOR C=1 TO 8 :: T=B(R,
C):: B(R,C)=B(R,17-C):: B(R,
17-C)=T :: NEXT C :: NEXT R
:: GOTO 380 !146
310 CALL WAIT :: FOR R=1 TO
16 :: FOR C=1 TO 16 :: B(R,C
)=-B(R,C)=0):: NEXT C :: NE
XT R :: GOTO 380 !170
320 DISPLAY AT(20,5)BEEP:"CH
ARACTER?" !028
330 CALL KEY(0,K,S):: IF S<1
OR K<32 OR K>126 THEN 330 E
LSE CALL CHARPAT(K,M$):: GOT
O 380 !199
340 FOR L=1 TO 1-3*(Q=4):: D
ISPLAY AT(20+L,5):SEG$(M$,L*
16-15,16):: NEXT L !056
350 DISPLAY AT(20,5)BEEP:"HE
XADECIMAL STRING?" :: M$=""
!028
360 FOR L=1 TO 1-3*(Q=4):: A
CCEPT AT(20+L,5)SIZE(-16)VAL
IDATE(HX$):T$ :: M$=M$&SEG$(
T$&K$,1,16):: NEXT L :: M$=M
$&K$ :: GOTO 380 !147
370 CALL WAIT :: FOR R=1 TO
16 :: FOR C=1 TO 16 :: B(R,C
)=0 :: NEXT C :: NEXT R !120
380 DISPLAY AT(1,8)ERASE ALL
:"SPRITE BUILDER" :: DISPLAY
AT(3,3):HX$ !181
390 FOR L=1 TO 16 :: DISPLAY
AT(3+L,2):SEG$(HX$,L,1):: N
EXT L !120
400 CALL WAIT :: IF Q=1 OR Q
=3 THEN CALL MG(M$)ELSE IF Q
=5 THEN 460 !083
410 IF Q>5 AND Q<9 THEN GOSU
B 630 :: GOSUB 670 :: GOTO 4
50 !222
420 GOSUB 660 !230
430 M$=M$&K$ :: FOR R=1 TO 1
6 :: FOR C=1 TO 13 STEP 4 ::
T=ASC(SEG$(M$, (R*2+(C<5)+(C
>8)*-31+(C<13)+1,1))-48 ::
IF T>9 THEN T=T-7 !224
440 FOR M=0 TO 3 :: B(R,C+M)
=P(T,M+1):: CALL HCHAR(R+3,C
+4+M,B(R,C+M)+138):: NEXT M
:: NEXT C :: NEXT R :: GOTO
470 !144
450 FOR R=1 TO 16 :: FOR C=1
TO 16 :: CALL HCHAR(3+R,C+4
,B(R,C)+138):: NEXT C :: NEX
T R :: GOTO 470 !036
460 FOR R=1 TO 16 :: CALL HC
HAR(3+R,5,138,16):: NEXT R !
095
470 DISPLAY AT(24,2)BEEP:"PR
ESS ENTER WHEN DONE." !078
480 FOR R=1 TO 16 :: FOR C=1
TO 16 !099
490 CALL GCHAR(3+R,4+C,L)::
CALL HCHAR(3+R,4+C,136-(L=13
9))!057
500 CALL KEY(0,K,S):: IF S=0
THEN 500 ELSE IF K=13 THEN
CALL WAIT :: GOSUB 620 :: GO
TO 690 !136
510 IF K>7 AND K<12 THEN GOS
UB 760 :: GOTO 490 !055
520 IF K=68 OR K=100 THEN K=
9 :: GOTO 560 !162
530 IF K=69 OR K=101 THEN K=
11 :: GOTO 560 !206
540 IF K=83 OR K=115 THEN K=
8 :: GOTO 560 !164
550 IF K<>88 AND K<>120 THEN
570 ELSE K=10 !213
560 GOSUB 760 :: GOTO 490 !0
06
570 K=K-48 :: IF (K<0)+(K>1)
<=-1 THEN 500 !156
580 B(R,C)=K :: FL=1 !204
590 CALL HCHAR(3+R,4+C,138+K
):: NEXT C !129
600 IF R=16 THEN R=0 !126
610 NEXT R !232
620 CALL HCHAR(3+R,4+C,138+B
(R,C)):: IF FL=0 THEN RETURN
!089
630 M$="" :: FOR M=0 TO 8 ST
EP 8 :: FOR R=1 TO 16 :: FOR
L=0 TO 4 STEP 4 !213
640 H=B(R,M+L+1)*8+B(R,M+L+2
)*4+B(R,M+L+3)*2+B(R,M+L+4)+
1 !112
650 M$=M$&SEG$(HX$,H,1):: NE
XT L :: NEXT R :: NEXT M !06
0
660 FOR L=0 TO 3 :: FOR M=1
TO 4 :: DISPLAY AT(20+L,M*5-
3):SEG$(M$,L*16+M*4-3,4):: N
EXT M :: NEXT L !153
670 CALL CHAR(132,M$&K$):: C
ALL HCHAR(5,26,132):: CALL H
CHAR(6,26,133):: CALL HCHAR(
5,27,134):: CALL HCHAR(6,27,
135)!130
680 CALL SPRITE(#1,132,5,100
,200):: FL=0 :: RETURN !095
690 DISPLAY AT(24,1)BEEP:"PR
ESS R TO REPEAT; P PRINT" !0
91
700 CALL KEY(3,K,S):: IF S<1
THEN 700 ELSE IF K=82 THEN
470 ELSE IF K<>80 THEN 210 !
229
710 CALL DUMP3(P$):: GOTO 69
0 !057
720 CALL SOUND(800,130,0,390
,0,160,0):: DISPLAY AT(24,3)
:"PRESS SPACE BAR TO QUIT" !
047
730 CALL KEY(0,K,S):: IF S<1
THEN 730 ELSE IF K<>32 THEN
210 !107
740 IF Z$="D" THEN OPEN #47:
W$,VARIABLE 163,DISPLAY ,APP
END :: PRINT #47:CHR$(255);C
HR$(255):: CLOSE #47 !234
750 CALL CLEAR :: STOP !235
760 CALL HCHAR(3+R,4+C,138+B
(R,C))!210
770 ON K-7 GOTO 780,800,820,
840 !031
780 C=C-1 :: IF C=0 THEN C=1
6 :: R=R-1 :: IF R=0 THEN R=
16 !130
790 RETURN !136
800 C=C+1 :: IF C=17 THEN C=
1 :: R=R+1 :: IF R=17 THEN R
=1 !132
810 RETURN !136
820 R=R+1 :: IF R=17 THEN R=
1 !031
830 RETURN !136
840 R=R-1 :: IF R=0 THEN R=1
6 !030
850 RETURN !136
860 DISPLAY AT(20,1):"PRINTE
R OR DISK FILE? ";Z$ !140
870 ACCEPT AT(20,24)SIZE(-1)
VALIDATE("DP"):Z$ :: IF Z$=""
(See Page 14)

```

## EXTENDED BASIC—

```

(Continued from Page 13)
P" THEN 900 !121
880 IF W$="" THEN 890 ELSE D
ISPLAY AT(22,1):"FILE NAME?"
:"DSK1." :: ACCEPT AT(23,1)V
ALIDATE(UALPHA,DIGIT,".")SIZ
E(-14):W$ !049
890 CALL SUBBER(W$,M$,LN)::
LN=LN+10 :: GOTO 210 !138
900 DISPLAY AT(20,1):"WHAT I
S THE PRINTER CALLED?":P$ !2
09
910 ON ERROR 1170 !159
920 ACCEPT AT(21,1)SIZE(-24)
:P$ :: IF P$="" THEN CALL HC
HAR(19,1,32,96):: GOTO 210 !
140
930 DISPLAY AT(20,1):"SPRITE
NAME?":Y$ :: ACCEPT AT(21,1
)SIZE(-28):Y$ !198
940 DISPLAY AT(20,1):"PRINT
SPRITE PATTERN? Y/N":S$ :: A
CCEPT AT(21,1)SIZE(-1)VALIDA
TE("YN"):S$ !008
950 IF LEN(M$)>64 THEN M$=SE
G$(M$,1,64)!084
960 M$=M$&RPT$("0",64-LEN(M$
)):: IF SEG$(M$,17,48)=RPT$(
"0",48)THEN M$=SEG$(M$,1,16)
!151
970 FOR L1=1 TO 13 STEP 4 ::
FOR C=1 TO 16 :: TX=0 !031
980 FOR R=L1 TO L1+3 :: TX=T
X*2+B(R,C) :: NEXT R :: TT((L
1-1)*4+C)=TX :: NEXT C :: NE
XT L1 !215
990 IF S$="N" THEN 1060 !112
1000 CALL HD(P$,M$)!248
1010 ON ERROR 1170 !159
1020 OPEN #1:P$&".CR" :: PRI
NT #1:CHR$(27);CHR$(65);CHR$(
4)!100
1030 FOR L5=0 TO 48 STEP 16
:: PRINT #1:CHR$(13);CHR$(10
);" " ;CHR$(27);CHR$(75);
CHR$(16);CHR$(0);!046
1040 FOR L=L5+1 TO L5+16 ::
PRINT #1:CHR$(TT(L));:: NEXT
L :: NEXT L5 !021
1050 PRINT #1:CHR$(27);CHR$(
50);:: CLOSE #1 !177
1060 OPEN #1:P$,VARIABLE 132
!198
1070 PRINT #1:TAB(5);Y$ !224
1080 PRINT #1:" " ;:: FOR
L=1 TO 13 STEP 4 :: PRINT #
1:SEG$(M$,L,4);" " ;:: NEXT L
!235
1090 PRINT #1:TAB(35);:: FOR
L=1 TO 8 :: PRINT #1:TT(L)*
16+TT(L+16);:: NEXT L :: IF
LEN(M$)<17 THEN 1160 !085
1100 PRINT #1:" " ;:: F
OR L=17 TO 29 STEP 4 :: PRIN
T #1:SEG$(M$,L,4);" " ;:: NEX
T L !223
1110 PRINT #1:TAB(35);:: FOR
L=9 TO 16 :: PRINT #1:TT(L)
*16+TT(L+16);:: NEXT L !222
1120 PRINT #1:" " ;:: F
OR L=33 TO 45 STEP 4 :: PRIN
T #1:SEG$(M$,L,4);" " ;:: NEX
T L !219
1130 PRINT #1:TAB(35);:: FOR
L=33 TO 40 :: PRINT #1:TT(L)
*16+TT(L+16);:: NEXT L !009
1140 PRINT #1:" " ;:: F
OR L=49 TO 61 STEP 4 :: PRIN
T #1:SEG$(M$,L,4);" " ;:: NEX
T L !224
1150 PRINT #1:TAB(35);:: FOR
L=41 TO 48 :: PRINT #1:TT(L)
*16+TT(L+16);:: NEXT L !016
1160 PRINT #1 :: CLOSE #1 ::
CALL CLEAR :: GOTO 210 !162
1170 ON ERROR 1180 :: CALL S
OUND(900,-3,0):: DISPLAY AT(
19,1):"VERIFY DEVICE NAME:"
:P$:"IS PRINTER TURNED ON?"
: RETURN 920 !019
1180 ON ERROR 1170 :: RETURN
1060 !154
29000 SUB MG(A$)!209
29010 DIM P$(16)!156
29020 DATA 0000,0303,0C0C,0F
0F,3030,3333,3C3C,3F3F,C0C0,
C3C3,CCCC,CFCF,F0F0,F3F3,FCF
C,FFFF !144
29030 IF G THEN 29050 !047
29040 RESTORE 29020 :: FOR L
=0 TO 15 :: READ P$(L):: NEX
T L !198
29050 G=1 :: X$="" :: FOR M=
1 TO 15 STEP 2 :: X$=X$&P$(A
SC(SEG$(A$,M,1))-48+7*(ASC(S
EG$(A$,M,1))>57)): NEXT M !
120
29060 FOR M=2 TO 16 STEP 2 :
: X$=X$&P$(ASC(SEG$(A$,M,1))
-48+7*(ASC(SEG$(A$,M,1))>57)
):: NEXT M :: A$=X$ :: SUBEN
D !193
29070 SUB WAIT :: DISPLAY AT
(24,2):"ONE MOMENT PLEASE" :
: SUBEND !100
29080 SUB HD(P$,X$)!007
29090 ON ERROR 29270 !209
29100 DIM A$(16),Z$(4)!040
29110 DATA 0000,0001,0010,00
11,0100,0101,0110,0111,1000,
1001,1010,1011,1100,1101,11
0,1111 !240
29120 IF F=1 THEN 29140 !064
29130 RESTORE 29110 :: FOR L
=0 TO 15 :: READ A$(L):: NEX
T L :: F=1 !145
29140 OPEN #1:P$&".CR" :: PR
INT #1:CHR$(13);CHR$(27);CHR
$(65);CHR$(7);" " !01
5
29150 M=LEN(X$)/16 !190
29160 IF M>1 THEN Z$(4)=SEG$(
X$,49,16):: Z$(3)=SEG$(X$,1
7,16):: Z$(2)=SEG$(X$,33,16)
!207
29170 Z$(1)=SEG$(X$,1,16)!24
5
29180 FOR LN=0 TO 2+2*(M=1)S
TEP 2 !039
29190 FOR L=1 TO 15 STEP 2 :
: IF LN=2 THEN T=M ELSE T=M+
N(2,M)!097
29200 FOR L2=LN+1 TO T :: FO
R L3=0 TO 1 !017
29210 N=ASC(SEG$(Z$(L2),L+L3
,1))-48 :: IF N>9 THEN N=N-7
!201
29220 PRINT #1:CHR$(27);CHR$(
75);CHR$(32);CHR$(0)!001
29230 FOR L4=1 TO 4 :: IF SE
G$(A$(N),L4,1)="" THEN C=0
ELSE C=127 !004
29240 PRINT #1:RPT$(CHR$(C),
8):: NEXT L4 :: NEXT L3 :: N
EXT L2 !149
29250 PRINT #1:CHR$(10);CHR$(
13);" " :: NEXT L ::
NEXT LN !116
29260 PRINT #1:CHR$(27);CHR$(
48):: CLOSE #1 !004
29265 SUBEND !168
29270 SUB DUMP3(P$)!184
29275 ! SCREEN DUMP BY ACTUA
L CHARACTER PATTERN JLS 6/89
!056
29280 DIM C$(143)!193
29283 FOR L=132 TO 135 :: C$

```

(See Page 15)

## EXTENDED BASIC—

(Continued from Page 14)

```
(L)=" " :: NEXT L !151
29285 OPEN #8:P$&".CR",OUTPU
T :: PRINT #8:CHR$(27);CHR$(
65);CHR$(8);!212
29290 FOR R=1 TO 24 :: FOR C
=1 TO 32 :: CALL GCHAR(R,C,T
)!109
29295 IF T<32 THEN T=32 !183
29300 IF C$(T)=" " THEN CALL
CHARPAT(T,S$):: CALL CHARPR
T(S$,C$(T))!252
29305 PRINT #8:C$(T);!043
29310 NEXT C :: PRINT #8:CHR
$(10);CHR$(13):: NEXT R :: P
RINT #8:CHR$(10);CHR$(13)::
CLOSE #8 !043
29315 SUBEND !168
29320 SUB CHARPR(T,C$,T$)!131
29325 DIM T(16)!124
29330 C$=C$&RPT$(" ",16)!110
29335 FOR L=1 TO 16 :: T(L)=
ASC(SEG$(C$,L,1))-48 !088
```

```
29340 IF T(L)>9 THEN T(L)=T(
L)-7 !157
29345 NEXT L !226
29350 FOR L=1 TO 8 :: C(L)=0
:: NEXT L !219
29355 FOR L=1 TO 2 :: FOR L2
=L TO 16 STEP 2 :: FOR P=0 T
O 3 !035
29360 IF (T(L2)AND 2^P)=2^P
THEN C((L-1)*4+4-P)=C((L-1)*
4+4-P)+2^(INT((16-L2)/2))!10
4
29365 NEXT P :: NEXT L2 :: N
EXT L !224
29370 T$=CHR$(27)&CHR$(75)&C
HR$(8)&CHR$(0):: FOR L=1 TO
8 :: T$=T$&CHR$(C(L)):: NEXT
L !028
29375 SUBEND !168
30820 SUB PAUSE !236
30825 FOR D=1 TO 100 :: NEXT
D !241
30830 DISPLAY AT(24,2):"PRES
S ANY KEY TO CONTINUE" !088
```

```
30835 CALL KEY(0,K,S):: IF S
<1 THEN 30835 !049
30840 SUBEND !168
31600 SUB SUBBER(D$,A$,LN)!1
08
31605 ! SUBBER(FILE NAME,DAT
A,LINE NUMBER OF FIRST DATA
STATEMENT) !007
31610 ! DUMPS STRING DATA RE
SULTS OF MAIN PROGRAM TO A M
ERGE FORMAT DATA FILE :JLS 8
/1984 !152
31615 DEF CR$(S)=CHR$(INT(S/
256))&CHR$(S-INT(S/256)*256)
! CONVERTS LINE NUMBER INTO
CRUNCH FORMAT !034
31620 OPEN #1:D$,DISPLAY ,VA
RIABLE 163,APPEND !191
31630 PRINT #1:CR$(LN)&CHR$(
147)&CHR$(199)&CHR$(LEN(A$))
&A$&CHR$(0)!134
31640 CLOSE #1 :: SUBEND !19
3
```



**LAFLAMME & WRIGLEY  
WHOLESALE**

5480 Canotek Road, Unit #16  
GLOUCESTER, ONTARIO  
K1J 9H6  
TEL: (613) 745-2225 Fax: 744-4784

LAFLAMME & WRIGLEY DATA PHONES:  
DELPHI "JANELAFLAMME" (no space)  
CompuServe "76046,2006"  
Ottawa 888(TEKLINK) (613) 738-0017

Authorized Distributor for the following:

**ASGARD Software GENIAL COMPUTERWARE**  
**Inseebot, Inc. MYARC, Inc. T and J Software**

Support your Canadian dealers:

**COMPUTER DOWNLOAD  
UNLIMITED**

8 Talon St.  
North Bay, Ontario  
P1A 1N5  
(705) 476-9391

Data (TEKLINK) 476-3043  
CompuServe "73657,3617"  
DELPHI I.D. "CDU"

**DATA\*PORT**

2846 Gottingen St.  
Halifax, N.S.  
B3K 3E1  
(902) 454-0232

Data (TEKLINK) 455-2076

Dealer enquiries welcome!

## TI NET / DELPHI

## CONFERENCE SCHEDULE

You already know TI NET is THE network for the 9640 Geneve. Did you know that TI NET also supports your 99/4A on a full time basis? Take a look at the September and October conference schedule on TI NET:

- **TI BASE** - Everything you wanted to know - with Textants Steve Lambert!
- **Q & A's** - TI NET's Paul Charlton answers YOUR questions on the 99/4A and the 9640 Geneve!
- **CONVERT** - TI NET's Peter Hoddie takes you through the world of TI data conversion via software and hardware with other popular computers!
- **MYARC** - Lou Phillips updates the latest from Myarc!

## TI NET THANKS ALL MEMBERS

Thanks for the record breaking year on TI NET! We are now the fastest growing 99/4A - 9640 support network! Haven't experienced the TI NET wave? Find out why we are setting the Network pace - join TI NET for the BEST 99/4A and 9640 information available from the experts! Sorry, we don't have any special offers, just a LOW price of \$7.20 per standard connect hour (\$4.80 Advantage Plan) at 1200/2400 baud.

**\$19.95 ONLINE SIGN UP OFFER**  
Dial 1-800-365-4636 or 617-576-2981  
Press ENTER twice. At USERNAME type  
JOINDELPHI and Enter. At PASSWORD,  
type TISPECIAL and Enter.

**DELPHI:**  
3 Blackstone St.,  
Cambridge, MA 02139  
TI NET: P.O. Box 244  
Lorton, VA 22079

## TIPS ON USING TI-WRITER

# Avoiding problems with the Formatter

By FRANK GEITZLER

Several recent letters to the MICROpendium feedback column have prompted me to develop this little TI-WRITER formatter utility. With it one can cause the four "special" characters (\*, &, ^, and @) to print normally. This utility also serves as a mini-tutorial for the TransLiterate command (.TL), the Include File command (.IF), the Define Prompt command (.DP), the COmment (.CO), and the use of "\*"n\*" where "n" is a value from 1 to 99, to prompt for an input value for the formatter.

First write your article, program, or whatever you wish to print, exactly as you wish to print it. If you want to print an asterisk, type a "\*" If you want to print an ampersand, type a "&," and so on. It is a good idea to save this file before continuing. In this example, I will call this file "DSK2.UFTXT" (for "unformatted text"). Do not quit the text editor, or purge the file, however.

The next step is to choose four special characters, which you have not used in this file, to be used as substitutes for the four "problem" characters. The way I do this is to select a character I do not think I have used, and use the FIND STRING command to make sure:

```
FS
/~/
```

Make sure to position the cursor at the beginning of the text before beginning the search for each of these special characters, and if a special character is found, try again using a different special character. The four I chose in writing this article are characters 37 to replace character 38, character 125 to replace character 42, character 91 to replace character 64, and character 123 to replace character 94. I also used character 92 to cause character 123 to print in the following example.

Having selected your four special characters, use the Replace String (RS) command to substitute them throughout the text. You can use the "All" option here, since you already made sure that they did not exist in the text. Be sure to turn word-wrap off before making this change, though, or strange things could happen to the text. (That's one reason you saved it before you reached this point, isn't it!) For example, to cause the "&" to print correctly:

```
RS
/~/
```

With all the substitutions made, the next step is to save the file again — I suggest that you use a different name, just so you can get back the un-substituted characters again if you wish. Let's call this file "DSK2.FMTXT" (for "formatted text"). If after printing you decide to make changes, go back to the "UFTXT" file, and repeat the above procedure, so you do not accidentally get yourself into a spot you can't get out of.

You are now ready to print. Load the formatter, but select the transliterate comand file as the file to be printed. I called the file "DSK2.TL," and it contains the following commands:

```
.CO This is a header file used
.CO to enable the printing of
.CO the characters '[', 'x', '^',
```

```
.CO and '}' without modification
.CO by the text formatter.
.CO prompts 1 through 5 are inserted
.CO to allow several files to be printed
.CO one after another, and to
.CO permit termination without
.CO skipping to a new page.
.DP 1:INPUT FILE 1 (Fctn-4 to stop):
.DP 2:INPUT FILE 2 (Fctn-4 to stop):
.DP 3:INPUT FILE 3 (Fctn-4 to stop):
.DP 4:INPUT FILE 4 (Fctn-4 to stop):
.DP 5:INPUT FILE 5 (Fctn-4 to stop):
.DP 38:ASCII code for 'and'-sign?
.DP 42:ASCII code for '}''?
.DP 64:ASCII code for 'at'-sign?
.DP 94:ASCII code for '^'?
.TL }38}:38
.TL }42}:42
.TL }64}:64
.TL }94}:94
.IF }1}
.IF }2}
.IF }3}
.IF }4}
.IF }5}
```

When the formatter has read the file "DSK2.TL," it will display a series of prompts at the bottom of the screen. The first asks what ASCII character you have chosen and keyed in your formatted text file to replace the ampersand. In my example, I chose ASCII 37, the percent sign, so I would enter "37." The next prompt asks for the value used to replace the asterisk character, and so on. Following the four replacement prompts, you are asked for the name of the first file to print. For our example, this would be "DSK2.FMTXT." The formatter would read and print this file, then stop and prompt for the next filename. Here you can do several things:

1. Press Fctn-4 to stop printing. This avoids the automatic skip to a new page (which sometimes skips several pages). If Fctn-4 is pressed, when you return to the editor the default file name may have been "forgotten."

2. Home the printer to a new page by hand, and then enter a new file name to start a new list.

3. Do not home the paper, but enter a new file name to continue with the next file — this option could be used to continue a large list which had been broken into several parts.

I hope this article has cleared up some of the mysteries of the text formatter. If you have any other questions, I would be pleased to hear from you.

Readers may send correspondence to: Frank Geitzler, 5 Leaman Dr., Dartmouth, Nova Scotia, Canada B3A 2K4.



★ **TI INTERNATIONAL EXPO 89** ★

Saturday, September 16, 1989

**VENDORS — WORKSHOPS — NEW PRODUCTS**

CELEBRATE THE 10TH ANNIVERSARY OF THE TI HOME COMPUTER AT EXPO 89 !!

Howard Johnson Inn  
5821 Richmond Highway  
Route 1  
Alexandria, Virginia  
703-329-1400

Show Time: 9:00 am - 5:00 pm  
General Admission: \$4.00  
Advance Ticket Sales: \$3.00  
See July MICROpendium for  
hotel rates and availability.

Vendor Booth Rates: \$50.00  
1st table. \$15.00 2nd table  
User Group Booths: Contact  
EXPO 89.  
Limited space available !

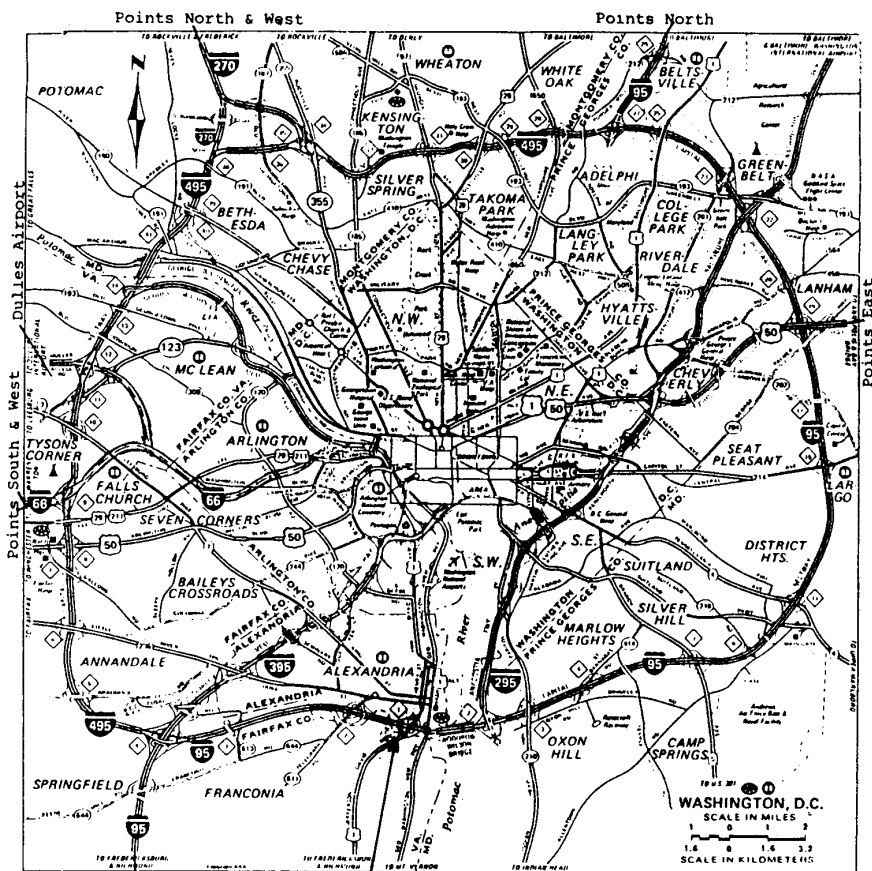
Call or write for additional details,  
booth information or advance sales:  
Mid-Atlantic Ninety-Niners  
TI International Expo 89  
P.O. Box 4005, Rockville, MD 20850  
EXPO 89 Info Line: 301-340-7179  
Delphi: TELEDATA - CIS: 74405,1207

**Transportation/Directions:**

Arriving by air: Call EXPO 89 for  
airport and public transportation  
information from airports.

Arriving by Amtrak Train: From points  
North and West of Washington, arrive at  
Union Station, Washington, D.C.. From  
points South of Washington, arrive  
Alexandria, VA Station. Subway stops  
located at Alexandria, VA and Union  
Station. Take Yellow line subway train  
to Huntington Street stop, end of the  
Yellow Line in VA on subway maps. Call  
the Howard Johnson for shuttle pick up.

By Automobile: See map for highway  
route numbers for the direction you are  
coming from. EXPO 89 Show location is  
off U.S. Interstate 95, Capital  
Beltway, at the Virginia state line.  
Take Exit 1 (Route 1 South, Ft Belvoir  
exit sign) on I-95. Upon exiting onto  
Route 1, you will see the familiar  
Howard Johnson orange roof.



**DISK ONLY SOFTWARE  
FEATURED ITEMS**

- GENIAL COMPUTERWARE**
- Picture Transfer ..... \$30.00
  - MacFlix ..... \$15.00
  - FirstBase ..... \$49.95
  - AV-Index ..... \$15.00
  - DISKASSEMBLER 9640 ..... \$22.00
  - PC Transfer ..... \$25.00
  - Hypercopy ..... \$20.00
  - GENProg .. See ad in this issue

- ASGARD SOFTWARE**
- Page Pro 99 ..... \$24.95
  - Batch It! ..... \$19.95
  - Typewriter 99 ..... \$14.95
  - Calendar Maker 99 ..... \$19.95

**MYARC PRODUCTS**  
We carry the full line of Myarc  
products. Call 301-340-7179 for the  
LOWEST cash and credit card prices!

**DISK ONLY SOFTWARE**  
P.O. Box 244  
Lorton, VA 22079

Add 80 cents shipping per item.  
Credit Card Orders: 1-800-736-4951  
Toll Free now available in Canada!  
Visa-MasterCard-Amex accepted.  
Write for a free product catalog.

## CALENDAR

# Third-part of program outputs to screen

The following two programs are designed to work with the CALENDAR2 program published in the May edition and the CALENDAR3 program published in June.

The CALENDAR 2 and 3 program output to a printer while the CALENDAR1 program listed here outputs to a monitor. A second program is included that functions as a menu/loader for the three calendar programs.

The author of the calendar programs is Dale A. Kloes.

## CALENDAR1

```

10 REM CALENDAR1 - DISPLAY M
ONTH !078
20 REM (C) 1983-1989 BY DALE
A. KLOES PUBLIC DOMAIN !
128
30 REM MODIFIED 6/89 FOR MIC
ROPENDIUM !164
40 REM REMOVED MONTHLY THEME
PICTURES !057
50 CALL CLEAR !209
60 CALL SCREEN(4)!149
70 DEF INVERT(A)=A-INT(A)!07
7
80 DIM DOTWS$(5,6)!009
90 CALL COLOR(12,2,2)!223
100 MONMSG1$=" 1 - JAN 2 -
FEB 3 - MAR " !010
110 MONMSG2$=" 4 - APR 5 -
MAY 6 - JUN " !069
120 MONMSG3$=" 7 - JUL 8 -
AUG 9 - SEP " !072
130 MONMSG4$=" 10 - OCT 11 -
NOV 12 - DEC " !092
140 MONMSG5$=" ENTER THE MON
TH NUMBER " !021
150 YRMSG1$=" ENTER THE YEAR
" !140
160 YRMSG2$="YEAR MUST BE 15
83 THRU 9999" !033
170 MONMSG6$="INVALID MONTH!
TRY AGAIN!" !087
180 DISPLAY AT(1,1):"
DISPLAY MONTH" !210
190 DISPLAY AT(2,1):"(C) 198
3-88 BY DALE A. KLOES" !131
200 DISPLAY AT(3,1):"
PUBLIC DOMAIN" !175
210 DISPLAY AT(6,1):YRMSG1$
:: ACCEPT AT(6,23)VALIDATE("
1234567890")BEEP SIZE(4):YR$
!187
220 IF VAL(YR$)>=1583 AND VA
L(YR$)<=9999 THEN DISPLAY AT
(24,1):" " :: GOTO 240 !157
230 DISPLAY AT(24,1):YRMSG2$
:: GOTO 210 !028
240 DISPLAY AT(8,1):MONMSG1$
!136
250 DISPLAY AT(10,1):MONMSG2
$ !179
260 DISPLAY AT(12,1):MONMSG3
$ !182
270 DISPLAY AT(14,1):MONMSG4
$ !185
280 DISPLAY AT(16,1):MONMSG5
$ :: ACCEPT AT(16,25)VALIDAT
E(DIGIT)BEEP SIZE(2):MN !057
290 DISPLAY AT(24,1):" " ::
CN=VAL(SEG$(YR$,1,2))!000
300 YR=VAL(SEG$(YR$,3,2))!03
3
310 ON ERROR 330 !084
320 ON MN GOTO 340,400,500,5
50,600,650,700,750,800,850,9
00,950 !040
330 DISPLAY AT(24,1):MONMSG6
$ :: ON ERROR STOP :: GOTO 2
80 !000
340 MN=11 !133
350 YR=YR-1 !208
360 MN$="JANUARY" !101
370 MX=31 !145
380 HF=4 !073
390 GOTO 990 !048
400 MN=12 !134
410 IF INVERT(YR/4)<>0 THEN
450 !233
420 MX=29 !152
430 IF YR<>0 THEN 460 !237
440 IF INVERT(CN/4)=0 THEN 4
60 !024
450 MX=28 !151
460 YR=YR-1 !208
470 MN$="FEBRUARY" !172
480 HF=4 !073
490 GOTO 990 !048
500 MN=1 !083
510 MN$="MARCH" !180
520 MX=31 !145
530 HF=3 !072
540 GOTO 990 !048
550 MN=2 !084
560 MN$="APRIL" !193
570 MX=30 !144
580 HF=3 !072
590 GOTO 990 !048
600 MN=3 !085
610 MN$="MAY" !046
620 MX=31 !145
630 HF=2 !071
640 GOTO 990 !048
650 MN=4 !086
660 MN$="JUNE" !122
670 MX=30 !144
680 HF=2 !071
690 GOTO 990 !048
700 MN=5 !087
710 MN$="JULY" !140
720 MX=31 !145
730 HF=2 !071
740 GOTO 990 !048
750 MN=6 !088
760 MN$="AUGUST" !035
770 MX=31 !145
780 HF=3 !072
790 GOTO 990 !048
800 MN=7 !089
810 MN$="SEPTEMBER" !244
820 MX=30 !144
830 HF=5 !074
840 GOTO 990 !048
850 MN=8 !090
860 MN$="OCTOBER" !089
870 MX=31 !145
880 HF=4 !073
890 GOTO 990 !048
900 MN=9 !091
910 MN$="NOVEMBER" !170
920 MX=30 !144
930 HF=4 !073
940 GOTO 990 !048
950 MN=10 !132
960 MN$="DECEMBER" !131
970 MX=31 !145
980 HF=4 !073
990 REM!154
1000 DY=1 !085
1010 GOSUB 1470 !019
1020 FOR K=0 TO 5 !061
1030 FOR I=D TO 6 !135
1040 IF DY=0 THEN 1100 !161
1050 IF DY>MX THEN 1090 !069
1060 DOTWS$(K,I)=STR$(DY)!185
(See Page 20)

```

TI FAIRE WEEKEND

\*\*\*\*\*

\*

WHERE: CHICAGO \* MILWAUKEE \*

Holiday Inn, 3505 \* Quality Inn, \*  
 Algonquin Rd. (Rt. 62) \* 5311 Howell Ave., \*  
 Rolling Meadows, IL. \* Milwaukee, WI \*  
 (across from Mitchell Field) \*

WHEN: Saturday November 4, 1989 \* Sunday November 5, 1989 \*  
 9 A.M. - 5 P.M. \* 9 A.M. - 5 P.M. \*

ADMISSION: \$4.00 \* \$2.00 (\$1.00 in \*  
 advance) \*

FOR INFORMATION CALL: (312) 869-4304 \* (414) 535-0133 \*

OR WRITE TO: Chicago Area TI \* The Milwaukee \*  
 Users' Group \* Users' Group \*  
 P.O. Box 578341 \* Mr. Gene Hitz \*  
 Chicago, IL 60657 \* 4122 N. Glenway \*  
 Milwaukee, Wi. \*  
 \* 53222 \*

BBS: (312) 862-0182 \* \*  
 \* GUEST SPEAKERS \*

VENDORS: Genie -Competition Computer Prods. \* \*  
 Data System-Chicago B128 Users' Group \* \*  
 Rave 99 Co. -B and D Computer Supplies \* \*  
 C and D Drive-Genial Computerware \* \*  
 Asgard Software -Will County Users' Group \* \*  
 Hunter Electronics -Great Lakes Software \* \*  
 L.L. Conner Enterprise-Chicago Area Users' Group \* \*  
 \* \*  
 \* RAFFLES \*  
 \*\*\*\*\*

(partial list)

Social Mixer: Friday, November 3, 1989  
 8:00 PM - 12:00 AM Admission \$5.00

DINNER: Saturday, November 4, 1989  
 7:00 PM - 9:30 PM Admission \$15.00

HOTEL ROOM RATES: Single - \$50.00 Double - \$50.00 Tower Room - \$50.00

# CALENDARI—

(Continued from Page 18)

```

1070 DY=DY+1 !179
1080 GOTO 1100 !159
1090 DY=0 !084
1100 NEXT I !223
1110 D=0 !251
1120 NEXT K !225
1130 CALL CLEAR !209
1140 PRINT TAB(2);YR$;TAB(16
-(HF+1));MNS$;TAB(25);YR$:!06
6
1150 PRINT TAB(2);"SUN~MON~T
UE~WED~THUR~FRI~SAT" !069
1160 FOR K=0 TO 5 !061
1170 PRINT TAB(2);DOTW$(K,0)
;TAB(6);DOTW$(K,1);TAB(10);D
OTW$(K,2);TAB(14);DOTW$(K,3)
;!082
1180 PRINT TAB(18);DOTW$(K,4
);TAB(23);DOTW$(K,5);TAB(27)
;DOTW$(K,6)!081
1190 NEXT K !225
1200 PRINT : : !187
1210 CALL HCHAR(13,2,126,30)
!016
1220 CALL HCHAR(22,2,126,30)
!016
1230 CALL VCHAR(14,6,126,8)!
247
1240 CALL VCHAR(14,10,126,8)
!035
1250 CALL VCHAR(14,14,126,8)
!039
1260 CALL VCHAR(14,18,126,8)
!043
1270 CALL VCHAR(14,23,126,8)

```

```

!039
1280 CALL VCHAR(14,27,126,8)
!043
1290 CALL VCHAR(14,2,126,8)!
243
1300 CALL VCHAR(14,31,126,8)
!038
1310 PRINT !156
1320 PRINT "PRESS 1 - SHOW M
ONTH" :: PRINT !199
1330 PRINT " 2 - PRINT
MONTH" :: PRINT !040
1340 PRINT " 3 - PRINT
YEAR" :: PRINT !211
1350 PRINT " 4 - EXIT P
ROGRAM" :: PRINT !106
1360 CALL SOUND(200,1397,5)!
193
1370 CALL KEY(0,K19,S19)!143
1380 IF S19=0 THEN 1370 !208
1390 IF K19<49 OR K19>52 THE
N 1360 !093
1400 CALL CLEAR !209
1410 ON K19-48 GOTO 1440,142
0,1430,1460 !149
1420 RUN "DSK1.CALENDAR2" !0
43
1430 RUN "DSK1.CALENDAR3" !0
44
1440 FOR K=0 TO 5 :: FOR I=0
TO 6 :: DOTW$(K,I)=" " :: N
EXT I :: NEXT K !253
1450 GOTO 180 !003
1460 STOP :: CALL CLEAR :: G
OTO 1460 !117
1470 REM SUBR TO DETERMINE T
HE DAY OF THE WEEK !151
1480 D=1+INT(2.6*MN-.2)+INT(
YR/4+YR)+(INT(CN/4)-2*CN)!07
0
1490 IF D>=0 THEN 1520 !173

```

```

1500 D=D+7 !007
1510 GOTO 1490 !038
1520 D=INT(7*INVERT(D/7)+.5)
!060
1530 IF YR+1<>0 THEN 1580 !0
13
1540 IF INVERT(CN/4)=0 THEN
1580 !125
1550 IF MNS$="JANUARY" THEN 1
570 !138
1560 IF MNS$<>"FEBRUARY" THEN
1580 !156
1570 D=D+1 !001
1580 RETURN !136
1590 END !139

```


## CALENDARMENU

```

10 REM CALENDAR !244
20 REM (C) 1983-1988 BY DALE
A. KLOES PUBLIC DOMAIN !0
95
25 CALL CLEAR :: CALL SCREEN
(8)!236
30 DISPLAY AT(1,1):" CAL
ENDAR PROGRAMS" !157
40 DISPLAY AT(2,1):"(C) 1983
-88 BY DALE A. KLOES" !131
50 DISPLAY AT(3,1):" P
UBLIC DOMAIN" !175
60 DISPLAY AT(6,1):"PRESS 1
- SHOW MONTH" !109
70 DISPLAY AT(8,1):" 2
- PRINT MONTH" !208
80 DISPLAY AT(10,1):" 3
- PRINT YEAR" !165
90 DISPLAY AT(12,1):" 4
- EXIT PROGRAM" !062
100 CALL SOUND(200,1397,5)!1
93
110 CALL KEY(0,K,S)!187
120 IF S=0 THEN 110 !117
130 IF K<49 OR K>52 THEN 100
!152
140 CALL CLEAR !209
150 ON K-48 GOTO 160,170,180
,190 !093
160 RUN "DSK1.CALENDAR1" !04
2
170 RUN "DSK1.CALENDAR2" !04
3
180 RUN "DSK1.CALENDAR3" !04
4
190 STOP :: CALL CLEAR :: GO
TO 190 !122
200 END !139

```

**THE BUNYARD  
HARDWARE MANUAL**  
FOR THE  
**TI 99/4A**



- CONSOLE DESIGN
- CUSTOM CHIP OPERATION
- TMS 9900 H W ORGANIZATION
- TMS 9900 INSTRUCTION SET
- INTERFACING PITFALLS
- CONSOLE SCHEMATICS
- PEB CARD DESCRIPTION
- GROM SIMULATOR DESIGN
- EXTENDED BASIC MODULE DESCRIPTION & SCHEMATICS

US \$21.95 CHECK OR MONEY ORDER  
CANADA & FOREIGN \$26 US FUNDS  
VOLUME RATES AVAILABLE  
SEND ORDERS TO:  
**THE BUNYARD GROUP**  
PO BOX 82323, COLO. SPRINGS,  
COLORADO 80982-2323

### Magazine holders

Keep organized with plastic magazine holders. Keep your MICROpendium in three-hole binders for ready reference. Holders are \$3 for 12, enough for 1 year's worth of MICROpendium. To order, send \$3 for each set, plus \$1 shipping per order to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

(Allow 2-4 weeks for delivery)

Use form on Page 48. Visa/MC welcome

## TRIALS OF A c99 BEGINNER

## Two more math functions

By CHARLES E. KIRKWOOD JR.

Have you ever had an idea which you thought was a good one, then discover that the idea was not so practical after all?

Well, I did!

Since Tom Bentley's floating-point library is required for the floating-point Mathematical functions, I thought that time could be saved by appending the Mathematical functions to the floating-point library, compiling and assembling this combined library to link with a program.

This worked fine for my sample program. But, then I wrote a program using two-dimensional floating-point arrays. You can probably guess what happened if you remember that floating-point numbers take up four times the memory of integers.

Back to the drawing board!

Actually all of the Mathematical functions are not really needed with every program. So I ended up modifying the functions and separating them into different D/V80 files. First, the function **init()** was eliminated and any required constants were initialized with each function. When a function uses one or more other functions, the additional function(s) are included.

For example, the function **ax()** requires **exp()** and **ln()**, so all three are included under a file name **AX**. The functions **exp()** and **ln()** are also stored as separate files, **EXP** and **LN**, respectively. In the modifications, I also shortened some of the variable names. You might find this idea advantageous, also.

I will be glad to send you these up-to-date files if you will send me a formatted disk with a self-addressed mailing label and return postage. My address is Box 1241, Clemson, SC 29633.

Included this month are two additional functions: square root and absolute value of a floating-point number. Newton's method for square root was discussed in the August 1988 issue. The function **root()** is an extension of the square root and, of course, can also be used for square root as well as other roots.

```

/*SQUARE ROOT OF A FLOATING-POINT NUMBER a*/
sqrt(a,r)
float *a,*r;
{
    float ro[8],rd[8],ra[8],o[8];
    float z[8],er[8],mo[8],t[8];
    stof("0.000001",er);
    itof(0,z);
    itof(1,o);
    itof(2,t);
    itof(-1,mo);
    fcpy(o,rd);
    fcpy(o,ro);
    fcpy(o,r);
    if(fcom(a,"=",o))
        return(r); /*if(a=1) r=1*/
    else if(fcom(a,"<=",z))
    {
        if(fcom(a,"<",z))

```

```

{
    puts("The root cannot ");
    puts("be calculated!\n");
}
fcpy(z,r);
return(r); /*if(a<=0) r=0*/
}
while(fcom(rd,">",er)) /*while(rd>er)*/
{
    fexp(a,"/",ro,r);
    fexp(r,"+",ro,r);
    fexp(r,"/",t,r); /*r=(ro+a/ro)/2*/
    fexp(r,"-",ro,rd);
    fexp(rd,"/",r,rd);
    if(fcom(rd,"<=",z))
        fexp(rd,"*",mo,rd); /*rd=abs((r-ro)/r)*/
    fcpy(r,ro); /*ro=r*/
}
return(r);
}

/*ABSOLUTE VALUE OF A FLOATING-POINT NUMBER a*/
abs(x,r)
float *x,*r;
{
    float z[8],mo[8];
    itof(0,z);
    itof(-1,mo);
    if(fcom(x,"<=",z))
        fexp(x,"*",mo,r);
    else
        fcpy(x,r);
    return(r);
}

```

Also included this month is a general purpose program that can be used with the **graph()** function to plot as many as 10 curves other than polynomials. The program uses integer variables and is not changed when you want to change the curve(s). The curve(s) to be plotted is(are) defined or solved in a function called **eq()**. The variables may be floating-point or integers, depending upon the equation(s). Any conversions are in this function. To change the equation(s), just change this function only.

The curves produced by the function **graph()** included with the polynomial curves program will be distorted when printed. The horizontal and vertical spacings are not the same. To make the x and y units on the Epson printer about the same the following changes are made in the function (refer to Clint Pulley's program PRSET supplied with the c99 package):

```

Change graph(n,m,dx,dy,x,yy,s,p,pr)
To graph(n,m,dx,dy,x,yy,s,p)
Change int m,n,dx,dy,p,pr;

```

(See Page 26)

**TEX+COMP**  
*Celebrating Our Tenth Year*

**FREEWARE** THE TOP IN QUALITY, SELECTION AND VALUE

ONLY **\$4.95** Per Disk

•• Public Domain and Shareware for the Texas Instruments TI-99/4A Computer.



**BONUS**

FREE DELUXE DISK STORAGE CASE WITH EACH ORDER OF FOUR OR MORE DISKS!!!

**NEW FOR 89' INCREDIBLE SOFTWARE**

GAMES • BUSINESS • GRAPHICS • WORD PROCESSING • UTILITIES • DATABASE • MUSIC • COMMUNICATIONS • HOME

The TEX-COMP Freeware program is a disk distribution service which is operated to support the TI-99/4A user and programmer and to keep the TI-99/4A the best value in the computer world. The nominal charge (4.95) that is charged for each title is for distribution services only and includes the cost of duplication, premium grade disks, labels, advertising and packaging including plastic disk cases that we include at no extra cost with orders of four or more disks. When a program requires more than one disk side, we supply a floppy or even a second disk at no extra cost. The programs we distribute come from all over the world and are either public domain or the author has expressly agreed to freeware distribution or has placed the program into freeware distribution by providing it to a commercial bulletin board service.



**#1. THE SINGING TI-99/4A SPEECH & MUSIC DISK**

This is the disk everyone is talking about. The computer voice actually sings to animated graphics. Includes routines by master programmer Ken Gilliland. Bert & Earnie, Maltilda & much much more. 2 disk sides, speech & 32 K req. Exbasic autoloader.

**#2. WHEEL OF FORTUNE, BLACKJACK & JOKER POKER**

Three fantastic freeware programs on one disk. Professional quality and the best "wheel" game around at any price. Vanna would love it!

**#3. DUMPIT**

This disk helps you transfer many TI modules to disk. Recommended for users with some programming ability. Ed/Assembler and "widget" recommended.

**#4. PRINTART**

Two disk sides filled with files that print out great quality pictures on most printers. Many famous TV and comic characters on this disk. "Beam me up Scotty."

**#5 ORIGINAL TI SALES DEMO DISK WITH TI-TREK GAME**

This disk is packed full of assorted files of all types. Graphics, speech etc. Contains complete TI-TREK game for Speech Editor or TE-11 module.

**#5A. TI MUSIC/GRAPHICS**

A great collection of music and matching graphics. Great examples of music & sprite programming.

**#6. EXBASIC MUSIC**

A two disk side collection of music & graphics that we consider some of the best.

**#7. SPACE SHUTTLE MUSIC/GRAPHICS**

One of the real outstanding examples of programming. This disk has it all. Great graphics, music, and continuity. A real salute to the space program. It is almost like watching a movie!

**#8. LOTTO PICKER**

This program randomly generates numbers for use in the various state lotto games and even runs a simulated lotto game. Easy to modify for pick 5 etc. games. A great learning and fun disk.

**#9. MONA LISA PRINT OUT**

This disk prints out a near photo quality picture of that lady with the classic smile. We understand it was made by digitizing the original with a super powerful computer and converting the output to run on the TI-99/4A. Impresses everyone who sees it! Requires Epson printer compatibility.

**#10. GOTHIC PRINT**

This disk lets you type out a phrase on the screen and then print it out in gothic (Old English) style. Looks like hand-lettered calligraphy. Use for invitations, announcements and business cards.

**#11. ANIMATED CHRISTMAS CARD "WOODSTOCK"**

This disk was actually originally sent to TEX-COMP as a greeting from master programmer Ray Kazmer. It was just too good not to share! One of the best examples of computer animation and graphics you will see on any computer!

**#12. TI-99 OLOPY**

This great piece of programming actually simulates and plays the famous board game. For legal reasons we cannot name the game but "do not pass Go! but go directly to Jail!"

**#13. STRIP POKER (PG RATED)**

Play Poker against your TI-99/4A. When you win a hand she loses--a piece of her clothes that is. Don't worry about being a lousy poker player. Another file is included where you don't even have to know an ace from a king.

**#14. FIGURE STUDY (PG RATED)**

A collection of Playboy type centerfolds that can be printed out at your command. Use with any printer.

**#15. STAR/EPSON PRINTER DEMO**

This 2 sided disk contains a large collection of demo programs to put your Star/Epson compatible printer through its paces. Learn what control codes can do! Lots of text and graphics examples. Second side has a great tutorial on printer graphics with examples!

**#16. SIDEWAYS PRINTOUT**

This program allows you to print out the material from your printer sideways. Great for spreadsheets, banners and large graphics. Second side contains some new enhancements for Multiplan not available on the TI upgrade.

**#17. TI FORTH DEMO**

This demo disk was released by TI to show the power of Forth. Fantastic music and graphics. Ed/Assem and 32K required!

**#18. TI DIAGNOSTIC**

This program loads into the Mini-Memory module and checks out your entire system. Much better than disk based diagnostics that cannot be used if a problem in the disk system is at fault. Complete documentation on second side.

**#19. TI WRITER/MULTIPLAN UPGRADE**

This disk released by TI adds real lower case to your TI Writer, speed to Multiplan and other... just substitute new files for old! Instructions included.

**#20. ACCOUNTS RECEIVABLE**

This self contained prize winning program loads and runs in Exbasic and has all the features found in a professional accounting system. Complete with documentation and a second disk side with report generating programs.

**#21. DATA BASE DEMO DISK**

A professional data base program that was originally written to store various magazine articles from computer magazines and then find them by name, subject, key word, or publication. Fast, easy to use and easy to adapt for other applications. Come complete with sample data to make learning data base processing easy. Completely menu driven and unprotected.

Send order and make checks payable to

**TEX+COMP**

P.O. BOX 33084 — GRANADA HILLS, CA 91344

TEX-COMP, Anaheim, CA & Los Angeles, California, services use cashiers check or money order. Add 3% shipping and handling \$3.00 Minimum. East of Mississippi add 4% add 3% for credit card orders. Prices and availability subject to change without notice. We reserve the right to limit quantities.



TEXAS INSTRUMENTS



24 Hour Order Line

**(818) 366-6631**

NOTE: Payment in full must accompany all orders. Credit card company check or money order is immediate payment. Personal checks require up to 4 weeks to clear. California orders add 6.5% sales tax.

# TEX+COMP Celebrating Our Tenth Year FREEWARE™

•• Public Domain and Shareware for the Texas Instruments TI-99/4A Computer.



ONLY **\$4.95** Per Disk

Public Domain and Shareware Programs to Meet Your Every Computing Need.



**BONUS**

FREE DELUXE DISK STORAGE CASE WITH EACH ORDER OF FOUR OR MORE DISKS!!!

**#22. ASTROLOGY**

This one is as good as anything you will see in an arcade. Great color graphics and displays of the Zodiac. Enter your birthdate and learn about your sign, your lucky days and famous events in history on your birthday. Even prints out a report. Can be used as a great money-maker at a charity event. Help guide your spouse's career.

**#23. WILL WRITER**

Enter your answers to a group of computer asked questions and this program then writes you a last will and testament. Now you can leave your TI-99/4A to your favorite nephew. Works with any printer. Appears legal in all states but better check that out!

**#24. ENGINEERING CALCULATIONS**

A two sided computer handbook of dozens of the most often used engineering and technical formulas. A real time saver. Does conversions, calculations and even designs electrical circuits. A must for anyone whose profession or hobby involves scientific calculations. Even has medical and communications applications.

**#25. MEDICAL ALERT**

This disk contains many menu accessible files covering most everyday medical emergencies. A good "what to do until the doctor or paramedic comes" guide. Well written and organized. Could very easily save a life!

**#26. R RATED GAME**

It was bound to happen. A talented (but demented) programmer in Germany wrote an Invaders type game but with most unusual guns and targets. Definitely not what you would find at your neighborhood arcade. Not only a great party game but some great programming. You must be over 18 to order this one!!

**#27. KIDS LEARNING**

An educator in Georgia put this two sided disk collection of educational programs together. Contains great material. Math, geography, reading improvement, and even IQ testing. All high quality programs for kids of all ages.

**#28. LOADERS AND CATALOGERS**

We put together a collection of the best programs that catalog and load a group of programs on a disk. Just try them, pick the one you like and transfer it to another disk with the file name LOAD and you are in business.

**#29. LABEL MAKER I**

Two great programs for making custom labels for disks, addresses, video tapes or any other application. Even contains a graphic display of the TI-99/4A console. Now you can create custom labels of any number by just typing in the lines as you want them. Uses standard tractor labels.

**#30. HOUSEHOLD BUDGET PRINTOUT**

With this disk you print out the data you have stored with the TI HBM Module. HBM is a great module that can be used for many home and small business applications but TI forgot to include a printout function. This program comes with full instructions and we are sure that your HBM Module will now start being used. Fantastic programming job.

**#31. MORSE CODE TRAINER DISK**

This disk has everything you need to learn and practice Morse Code for the various FCC license exams. It also is great for scout groups and school "ham" clubs for group training and merit badge qualification. Professional quality.

**#32. EXBASIC XMAS MUSIC**

Two disk sides full of high quality xmas music that can be played throughout the holiday season and then used as a learning tool since it contains wonderful arrangements and graphics. Autoloading and menu driven.

**#33. CHECKERS & BACKGAMMON**

A collection of great checkers and backgammon games for the TI-99/4A. These are professional in quality and will keep you busy for hours.

**#34. SOLITAIRE & SCRABBLE**

Another collection of classic games for the TI-99/4A. Exbasic & 32k req.

**#35. PROGRAMMING AIDS & UTILITIES I**

A collection of some unusual programs of interest to programmers. One program shows a group of opening title displays, another is a cross reference program as good as any of the commercial ones, plus a great disk management utility.

**#36. STRICTLY BUSINESS**

A collection of various programs for evaluating loans, calculating interest, and other financial items such as return on investment and security performance. Two disk sides filled with financial and business related programs.

**#37. LAPD COOKBOOK**

This unofficial police cookbook was put together by one of our boys in blue who is also a gourmet chef. (Yes, it contains jailhouse chili) Over 50 great recipes from soup to nuts on two disk sides and each separate side can be called up on screen or printer in exbasic from a menu. As good as any of the new PC computer cookbooks we have seen.

**#38. GREAT 99/4A GAMES VOL. I**

A collection of professional games in assembly and exbasic that all load from a menu in exbasic. Includes a great ski game where you dodge the trees in a fast downhill run. We have included only the best.

**#39. GREAT 99/4A GAMES VOL. II**

Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially.

**#40. ARTIFICIAL INTELLIGENCE**

This disk contains the famous computer program "Eliza" where you type in a question or a problem you are having and "Eliza" helps you find the solution. Also contains one of the better bio-rhythm programs so you can analyze all your emotional problems at one sitting.

**#41. VIDEO GRAPHS MODULE BACKUP DISK**

This disk is a backup of the discontinued Video Graphs Module from TI. For legal reasons, it can only be purchased for backup use by owners of the original module. Do not order UNLESS you have the original module and intend to use this disk only for backup purposes. Exbasic autoloading.

**#42. FUNNELWEB FARM UTILITY**

You heard about this one. Now direct from Australia is the latest version of this fantastic utility that puts everything at your command. From one program you can access word processing, editor assembler, telecommunications and just about everything else. A freeware program complete with documentation on a second disk side.

**#43. BEST OF BRITAIN, VOL I**

Now for the first time, a collection of the best 99/4A games Britain has to offer including the famous "Billy Ball" series of arcade games. Great graphics, action and excitement.

**#44. LABEL MAKER I GRAPHICS**

A disk filled with graphics for the Label Maker I disk (#29). Dozens of great graphics for custom labels!

**#45. BEST OF BRITAIN, VOL II**

This disk contains an outstanding 3-D graphics adventure game for the TI-99/4A. Carfax Abbey lets you actually move through a four story mansion complete with bats and vampires. You actually are placed in each room and go up and down stairs and through secret panels. Legend of Zelda, look out!

**#46. SUPER TRIVIA 99**

A great trivia game for 1 to 4 players with great questions and capability to add your own and print out the files. This one is a real challenge.

**#47. INFOCOM RAPID LOADER**

If you have Infocom games this is for you. Loads all TI Infocom games in only 28 seconds and permits new screen colors and improved text display. Comes with all documentation on disk.

Send order and make checks payable to  
**TEX+COMP**  
P.O. BOX 33084 — GRANADA HILLS, CA 91344



TEXAS INSTRUMENTS



24 Hour Order Line

**(818) 366-6631**

TERMS: All prices are in U.S. dollars. Payment should be made in U.S. dollars. All prices are subject to change without notice. We reserve the right to change prices and specifications without notice. We reserve the right to change prices and specifications without notice. We reserve the right to change prices and specifications without notice.

NOTE: Payment in U.S. dollars only. All prices are in U.S. dollars. All prices are subject to change without notice. We reserve the right to change prices and specifications without notice. We reserve the right to change prices and specifications without notice.

# TEX+COMP

*Celebrating Our Tenth Year*

# FREEWARE

•• Public Domain and Shareware for the Texas Instruments TI-99/4A Computer.



Public Domain and Shareware Programs to Meet Your Every Computing Need.

ONLY **\$4.95** Per Disk



**BONUS**

FREE DELUXE DISK STORAGE CASE WITH EACH ORDER OF FOUR OR MORE DISKS!!!

- #48. GHOSTMAN** (from England)  
This Pacman/Munchman type game starts at a slow pace and slowly speeds up to a break-neck pace. A totally new experience.
- #49. DEMON DESTROYER** (from France)  
This great assembly game starts where Invaders leaves off. Add features like descending aliens and closing walls. Hours of great arcade action.
- #50. OH MUMMY** (from Germany)  
Move through the chambers of a Pyramid in search of hidden treasure. Fantastic graphics and great entertainment.
- #51. BERLIN WALL** (from Canada)  
This game requires a mine field to be crossed before escaping from E. Berlin. Good graphics and a real challenge.
- #52. ANIMATION 99** (from Germany)  
**THIS IS THE ONE!!!** A demo disk filled with computer animation routines like you have never seen before on any computer. See famous cartoon figures move with more realism than on Sat. morning TV. This disk received a standing ovation when previewed at a local users group. We have even included instructions how to do it yourself on the second disk side. This one is a show stopper!!!
- #53. HACKER/CRACKER**  
A collection of disk copying programs that copy TI disks by tracks. If one of these can't copy a protected disk nothing will. We included a collection of the very best ones including both TI and CorComp compatible. These programs require 2 disk drives and 32K of memory.
- #54. ASTRONOMY**  
This program from Australia plots the heavens and teaches you about the solar system. A great learning and reference tool. Exbasic and 32K required. Don't confuse this one with our Astrology demo. They are not the same...ask Nancy!
- #55. SCREEN DUMP**  
This program allows you to dump disk and even module programs to a Star Epson compatible printer. Comes with easy to follow plans to build a load interrupt switch which is needed to dump module programs. This dump program by Danny Michael is considered the best of the bunch! Complete with documentation.
- #56. SPREAD SHEET**  
OK, it's not Multiplan but it works great and handles many spread sheet applications. A great way to learn to use spread sheet software. Comes with full instructions and documentation.
- #57. TELCO**  
Considered one of the best data communications programs for the TI-99/4A. Complete with documentation.

- #58. PR BASE**  
The alltime most popular and widely used data base program for the TI-99/4A. A freeware program that is widely supported and updated.
- #59. GRAPH MAKER**  
A collection of the best programs for producing graphs and charts from your data. Exbasic and printer.
- #60. FREDDY**  
A fantastic game where you guide the hero through underground passages filled with danger. Nintendo quality, great graphics and fast action. One of the best we have ever seen!!!
- #61. THE MINE**  
A fast action game from F.R.G. that will keep you going for hours. Many screens and skills required.
- #62. DISK MANAGER II MODULE BACKUP**  
The complete TI Disk Manager II on Disk. For legal reasons it is only available to owners of the original module for backup use.
- #63. ASTROBLITZ/MAZOC**  
A pair of great games that continue where Parsec and Munchman leave off. Imagine Parsec with enemy space craft coming from in front and in back of your ship!!!
- #64. MAJOR TOM/SPACE STATION PHETA**  
A pair of great space games. These two are going to keep you in front of the 99/4A for hours. Great!
- #65. PERFECT PUSH**  
An all new space game where you assemble and launch a rocket ship in outer space while avoiding a space monster. This one is professional in every way...graphics, speed and action!!!
- #66. HEBREW TYPEWRITER**  
This program converts your TI-99/4A keyboard into a typewriter that displays Hebrew letters on the screen. Can also be printed when used in conjunction with screen dump program (included). Great for religious training or making your copy of the dead sea scrolls or ten commandments!
- #67. GENEALOGY**  
Now you can set up your family tree and store or print out the records. Great for keeping track of family relationships and records.
- #68. CHESS**  
The original computer chess game Sargon has been reprogrammed for the TI-99/4A. Now play chess with your computer. Documentation included. Exbasic autoloader.
- #69. COMPUTER PLAYER PIANO/KEYBOARD CHORD ANALYSIS**  
A unique music program which displays a piano on the screen and actually plays your selections.
- #70. TI RUNNER II**  
The very latest (and best) "runner" game based on TI Runner and Star Runner. Great action, graphics and entertainment.

- #71. KIDS LEARNING II**  
Two more disk sides loaded with the best in educational programs. Kids improve their math, spelling and comprehension skills while having fun.
- #72. CERBERUS**  
Fantastic space game from Germany. Pilot your ship through narrow and crooked channels in space without colliding. Great graphics and music.
- #73. CRYPTO (gram)**  
One of the best word games we have seen for any computer. Set up like a TV game show with great screen displays.
- #74. LABEL MAKER II**  
Make labels for holidays and special events. You compose the text and select the resident graphics for the occasion.
- #75. DISK CATALOGER**  
Now you can organize your disk files with this great utility. Files, sorts, and prints your records. Easy to use.
- #76. PROGRAMMING AIDS AND UTILITIES II**  
A collection of very useful material. Includes a program to convert basic to exbasic so your old basic programs will load & run in exbasic, even with graphics. Also includes two on screen diagnostic programs to test your keyboard and processor. A great merge utility is also on this disk.
- #77. MICROdex 99**  
A database program by Bill Gaskill which files and retrieves data such as magazine articles. A sample database is included.
- #78. ARTCON+ BY RAY KAZMER**  
**ATTENTION GRAPHX AND TI ARTIST USERS!!!**  
This program lets you convert Exbasic graphics to TI Artist and Graphx pictures. Also contains a new MAC-RLE (2) for converting from Artist to Graphx.
- #79. DM1000 V3.5**  
One of the most popular disk managers for the TI-99/4A. Originally a rip-off of the CorComp manager, it has been improved and refined by talented users all over the world. This version is deemed the most reliable to date and is far advanced over the TI Disk Manager II. Distributed by permission from CorComp.
- #80. BIRDWELL DISK UTILITY**  
A must if you are into programming and software development. Besides being a great disk manager, it has provision for copying sectors, comparing files and is menu driven. Complete with documentation.
- #81. HOME ACCOUNTING SYSTEM**  
A complete family & small business accounting system including a checkbook manager, budget analysis, mailing list and an inventory program. Complete with documentation. Easy to modify for specific needs.
- #82. CROSSWORD PUZZLES**  
This program from Australia creates a different puzzle each time you run it. Self contained with definitions and vocabulary taken from a leading crossword dictionary. Great crossword fun.
- #83. HOME APPLICATION PROGRAMS**  
A two disk side collection of useful programs for the home. Includes banking, cooking, home bar guide, utility records, and much much more. Something for everyone.

Send orders and make checks payable to **TEX+COMP**  
P.O. BOX 33084 — GRANADA HILLS, CA 91344



24 Hour Order Line  
**(818) 366-6631**

TERMS: A price of \$4.95 per disk. All programs are for personal use only. No resale or distribution without written permission. All programs are guaranteed to work on a TI-99/4A computer. No refund on damaged disks. All programs are guaranteed to work on a TI-99/4A computer. No refund on damaged disks.

NOTE: Payment must accompany orders. Orders shipped only to the United States. Payment must be in US dollars. Payment must be made by check or money order. Payment must be made to the address listed above. Payment must be made to the address listed above.



# TEX\*COMP Celebrating Our Tenth Year FREEWARE

•• Public Domain and Shareware for the  
Texas Instruments TI-99/4A Computer.

Public Domain and Shareware  
Programs to Meet Your Every  
Computing Need.

ONLY **\$4.95** Per Disk



**BONUS**

FREE DELUXE DISK STORAGE  
CASE WITH EACH ORDER OF  
FOUR OR MORE DISKS!!!

**#84. GALACTIC BATTLE/SPY ADVENTURE**  
A pair of great commercial quality games from EB Software of TI Runner fame. Galactic Battle is a space "trek" type strategy game for one or more players. Spy Adventure is an adventure game that will keep you guessing for hours.

**#85. AUTOBOOT UTILITY**  
This utility which can be installed on a disk loads and runs or displays most files. Now you can have a disk with exbasic programs. Editor Assembler programs and TI Writer files and run or display them all from exbasic.

**#86. COLUMN TEXT III V3.2**  
A very useful utility for printing TI Writer and 99 Writer II files in separate spaced columns. Saves hours in producing a newsletter. Complete with documentation.

**#87. ARCHIVER III**  
This utility allows you to "pack" or combine several files into one for space utilization. A number of boards are sending files packed to save transmission costs. This utility will let you pack and/or unpack these files.

**#88. AUSSIE GAMES VOL 1**  
A collection of games from our friends down under. Includes a great card game and board game. Hours of fun and entertainment. Includes Matchmaker & TILO.

**#89. PROCALC**  
This is an on screen calculator for decimal/hexadecimal conversions and much more. A must for the serious programmer.

**#90. JET CHECKBOOK MANAGER**  
This checkbook manager is considered the ultimate with every feature you can think of for keeping track of your checking account and keeping records of your spending for budget and tax purposes. Complete with documentation.

**#91. "THE MAZE OF CROC"(St. Valentine)**  
Ray Kazner has created a great maze game with fantastic graphics and the characters from his now legendary "Woodstock" disk. Fun for all!!!!

**#92. HOUSEHOLD INVENTORY**  
Written by 99/4 programming great Charles Ehninger, this prize winner originally sold for \$59.95. Keeps track of household, business or personal items by category and provides automatic updating for inflation etc. A must for tax and insurance records!

**#93. THE 1989 KBGB GIRLIE CALENDAR**  
This latest offering from programming master Ken Gilliland prints out a jumbo 12 month calendar with a knock-out centerfold pinup for each month. If you like our #14 Figure Study disk, you will flip over this one. For Adults Only!! Exbasic & d/m printer.

**#94. GREAT 99/4A GAMES VOL. III**  
If you have seen vols. 1 & 2 of this series you know we only provide the very best. This latest volume is also filled with a collection of great ones!

**#95. WEATHER FORECASTER**  
The weather predictions are amazingly reliable and accurate! A great game "Lawnmower" and a mini database are also included to make this disk a fantastic value.

**#96. STATISTICS & SORTING**  
Two great assembly utilities by John Clulow. STAT is a set of statistic routines for use in exbasic. SORT allows sorting by two separate fields and a choice of two types of sorts.

**#97. MEMORY MANIPULATOR**  
This powerful utility lets you explore the entire memory in your 99/4A system and take apart what you find. User friendly!

**#98. DAYS OF EDEN & DOORS OF EDEN**  
Two bible games (non-fiction) that work with the TI Adventure Module.

**#99. GREAT 99/4A GAMES VOL. IV**  
This disk features the works of J. Peter Hoddie. All of these games are of commercial quality and well worth the donation requested!

**#100. ASSULT THE CITY (T. of DOOM)**  
An exciting game for use with the Tunnels of Doom module. Several Exbasic bonus games are included.

**#101. ENCHANCED DISPLAY PACKAGE**  
This screen enhancement utility lets you do 40 columns, windowing, reverse scrolling, clock/alarm, and a whole host of other great tricks in exbasic. Fully documented.

**#102. COLOSSAL CAVES ADVENTURE**  
This classic adventure now available for the 99/4A is what led to the Zork series. Hours of text adventuring.

**#103. SORGAN, THE 99/4A ORGAN**  
This program which is currently selling for big bucks on module turns your 99/4A into an electronic organ. Sound effects, different instruments and voices, chord forms, color graphics with complete control of all.

**#104. C99 COMPILER AND LIBRARY**  
This two-sided (flippy) disk gets you into C programming with your 99/4A. Comes with a great collection of utilities such as text & graphics. (E/A)

**#105. KING'S CASTLE+**  
A great arcade style assembly game formerly offered on module. Also includes an EB "Trek" game and a collection of sprite & graphics from Tiger Cub's Jim Peterson.

**#106. QUEST (Dungeons & Dragons)**  
One of the best D&D games around! You must destroy the Dark Lord to free your homeland! Complete with documentation on disk.

**#107. STAR TREK MUSIC ALBUM**  
Ken Gilliland's music and graphics version of the TV theme and the three motion pictures. (Exbasic)

**#108. FUNLPLUS BY JACK SUCHRUE**  
Fantastic disk packed with Funnelweb (#42) templates, utilities and prog. to augment and configure Funnelweb. Unbelievable collection of fantastic aids to make the best even better!

**#109. TI-WRITER MINI MANUAL**  
This disk prints out a five page TI Writer manual with everything you need to know to use TI Writer or the many clones such as 99Writer II. Additional aids for using this powerful word processor are included.

**#110. DISK + AID**  
A powerful disk sector editor formerly sold for \$20. Menu Driven and easy to use.

**#111. POP MUSIC & GRAPHICS**  
This exciting disk from Germany features music/graphics written in 100% assembly and what comes from the TI sound chip is sure to astound you.

**#112. INVOICE PACK**  
An excellent invoice preparation and printing program with instructions on how to modify it for your own business.

**#113. LABEL MAKER 3**  
A collection of label programs to create mailing and disk envelopes, disk labels and much more!

**#114. PANORAMA**  
A drawing and illustration program that compliments Graphx and TI Artist. A must for the serious 99/4A artist!

**#115. GRAPHICS DESIGN SYSTEM**  
A complete system for creating graphic screens in full color for your programs by J. Peter Hoddie. Fully documented.

**#116. FOURTH TUTORIAL**  
A lesson in FORTH programming on how to create graphics

**#117. UNIVERSAL DISASSEMBLER**  
This powerful utility written in Forth allows disassembly of programs off disk in any format, in memory, and even off of P-Box cards. Very complete with some very unique features.

**#118. FAST TERM**  
One of the most popular and recommended of the 99/4A terminal emulator programs. Supports TE-II, ASC11, and X-Modem transfers, print spooling and more. Loads from Exbasic or E/A.

**#119. RAG LINKER**  
A utility for converting DIS/FIX 80 assembly object code files to PROGRAM image. This allows files to load faster and take up less space on disk. Full Doc

**#120. BITMAC**  
The original BITMAC is now available at \$4.95 with all original documentation. A powerful graphics program for the 4A which lets you print where you want, even over pre-existing text. Create great graphics in 16 colors, print text sideways, mirror image, upside down etc. etc. A must for anyone into 99/4A graphics.

Comes with second bonus disk with utilities such as sign & banner makers. Even can computer generate your own signature!

**#121. SUPER YAHTZEE & WHEEL II**  
If you like Yahtzee this disk is for you. A great version written in high speed assembly. Also included is another version of Wheel of Fortune which also lets you create your own puzzles with a puzzle edit program included.

**#122. ADULT ADVENTURE**  
A truly adult adventure for use with the TI Adventure Module. Also included is a bonus adventure (not adult) "LOST GOLD" which is one of the better ones we have seen recently.

Send order and make checks payable to **TEX\*COMP**  
P.O. BOX 33084 — GRANADA HILLS, CA 91344

TERMS: All prices FOB Los Angeles. For information on our shipping charges, please refer to our shipping policy. Add the shipping and handling (\$3.00 minimum, East of Mississippi) to the Add'l \$1.00 Credit Card orders. Prices and availability subject to change without notice. We reserve the right to limit quantities.



TEXAS INSTRUMENTS



24 Hour Order Line

**(818) 366-6631**

NOTE: Payment in full must accompany all orders. Credit Card orders may be shipped on credit for immediate shipment. Personal checks require 10-15 business days. All orders add \$1.00 shipping.

c99—

(Continued from Page 21)

```
To      int m,n,dx,dy,p;
Change  int nn,nt,i,j,ymin,ymax;
To      int nn,nt,i,j,ymin,ymax,pr;
Add after the statement nt=0;
        if(p==2)
        {
          pr=fopen("PIO.LF","w");
          fputs("\0331",pr);
          fclose(pr);
          pr=fopen("PIO","w");
          putc(12,pr);
        }
        putchar(12);
Add just before return;
        if(p==2)
        {
          close(pr);
          pr=fopen("PIO.LF","w");
          fputs("\03300",pr);
          fclose(pr);
        }
}
```

The printer file is opened in the function as PIO.LF. The code 0331 tells the printer to set the line spacing to 7/72 of an inch, which is close to 1/10. This file is then closed and reopened as

PIO to print the graph. At the end of the graph() function 033@ will reset the printer.

To use this revised function with the polynomial evaluation program the following changes must be made in the program:

```
Change the last four statements from
        putchar(12);
        graph(nc,np,dx,dy,x,y,c,p,pr);
        if(p==2)
          fclose(pr);
To      if(p==2)
          fclose(pr);
        graph(nc,np,dx,dy,x,y,c,p);
```

Now to get back to the new program. The example chosen to show the use of the program with the function graph() is a cycloid. The cycloid is treated as two curves since a square root has a plus and minus value. The positive values are stored in  $y < 1 > < k >$  and the negative values in  $y < 2 > < k >$ , where k starts at 1 and continues until all points have been stored. The cycloid equation is:

$$x + y = a$$

The constant a was chosen as 20, the  $\frac{2}{3}$  power was calculated to be 7.3688553 and this number was used in the cycloid function so that it would not have to be recalculated every time. Note that the cycloid function is included as a D/V80 file. Solving the equation for y gives:

$$y = (20 - x)^{\frac{2}{3}}$$

My input data was the \* for the character for printing each part of the curve,  $x_0 = -20$ ,  $x_m = 20$ ,  $dx = 2$  and  $dy = 2$  for the screen,  $dx = 1$  and  $dy = 1$  for the printer. For curves of this type stay within the x bounds which, in this example, is between -20 and 20, inclusive. The value  $dy = 0$  is used when you are not sure how much space will be taken up by the graph. A dy value will be calculated so that the entire figure will be on the screen or page.

```
/*PROGRAM TO PLOT MATHEMATICAL EQUATIONS*/
#include DSK1.STDIO
#include DSK1.FLOATI
extern atoi(),printf(),fprintf();
main()
{
  int x[75],y[11][75],xo,xm,dx;
  char s[15],c[11];
  int dy,nc,np,i,j,k,p,pr,z;
  /* nc = number of curves */
  /* np = number of points */
  /* c = character symbols for curves */
  /* xo = initial x value */
  /* xm = final x value */
  /* dx = x step or increment */
  /* dy = y step or increment */
  puts("Input 1 for screen output or \n");
  puts("      2 for printer output      ");
  p=atoi(gets(s));
  if(p==2)
```

(See Page 27)

# HORIZON

**RAMDISK 3000** BAKE BOARD  
CONST MANUAL  
SOFTWARE **\$40**

**ZERO K KIT \$100      90 K KIT \$155**

**CHIP PRICES DOWN**

512K KIT \$395    384K KIT \$320    1 MEG KIT \$695

ADD \$30 FOR BUILT & 90 DAY WARRENTY

**P-GRAM CARD** Complete and  
Kits ONLY

KIT \$150.    KIT+CLOCK \$170 Includes  
ALL parts

**BUILT=\$180    BUILT+CLOCK=\$200** with 6Month  
warrenty

Includes User and Construction Guides Plus Software

**ORDER FROM      BUD MILLS SERVICES**

Visa, MC AmEx add 10%      166 DARTMOUTH DR.  
US & Canada

Call 1-800-736-4951      TOLEDO OH 43614

(DISK ONLY SOFTWARE)      419-385-5946

Ohio Residents add 6% sales tax  
Shipping and Handling included within U.S. and Canada  
Shipping OverSeas ADD \$ 5 Surface or \$15 AirMail  
INFO: BBS 419-385-7484 300/7/E or 1200/B/N

\*\*\*\*\*

c99—

(Continued from Page 26)

```

pr=fopen("PIO", "w");
puts("\nInput number of curves ");
nc=atoi(gets(s));
puts("\nInput character symbols for each curve");
for(i=1; i<=nc; ++i)
{
    printf("\nCurve #%d ", i);
    c[i]=getchar();
}
puts("\nInput initial value of x ");
xo=atoi(gets(s));
puts("\nInput last value of x ");
xm=atoi(gets(s));
puts("\nInput x increment ");
dx=atoi(gets(s));
puts("\nInput y increment ");
dy=atoi(gets(s));
k=1;
putchar(12);
while(xo<=xm)
{
    eq(k, xo, y);
    x[k]=xo;
    if(p==2)
    {
        fprintf(pr, "%4d ", xo);
        for(j=1; j<=nc; ++j)
            fprintf(pr, "%4d ", y[j][k]);
        putc(10, pr);
    }
    else
    {
        printf("%4d ", xo);
        for(j=1; j<=nc; ++j)
            printf("%4d ", y[j][k]);
        putchar(10);
    }
    xo=xo+dx;
    ++k;
}
np=k-1;
if(p==2)
    fclose(pr);
else
{
    puts("Press any character ");
    z=getchar();
}
graph(nc, np, dx, dy, x, y, c, p);
#include DSK1.ROOT
#include DSK1.GRAPH
#include "DSK1.CYCLOID"

/*CYCLOID*/
eq(k, x, y)
int k, x, y[][75];
{
    float yf[8], a[8], hf[8], y3[8];
    float y1[8], y2[8], a1[8], y4[8];
    int xx;
    xx=x*x;
    itof(xx, y1);
    root(3, y1, y2);
    stof("7.3688553", a);
    fexp(a, "-", y2, y3);
    fexp(y3, "*", y3, y4);
    fexp(y4, "*", y3, y4);
    root(2, y4, yf);
    y[1][k]=ftoi(yf);
    y[2][k]=-y[1][k];
    return;
}

```

Load the following object files with your program: CSUP, CFIO, PRINTF, FPRINTF, and FLOAT.

## Comprodine offers poster program

Comprodine has recently released Giant Artist Posters, for use with TI-Artist.

Giant Artist Posters (G.A.P.) by Paul Coleman, author of Designer Labels, creates posters using TI-Artist screens, according to the manufacturer. Full-screen TI-Artist pictures saved as "instances" are loaded, then printed out in nine sizes ranging from 10" x 14" to larger than 5' x 7'. Pictures can be printed in two formats on any Epson-compatible printer; the manufacturer says.

The program is written in c99.

Program features include a size chart (to provide information regarding the number of screens, number of sheets, size of finished poster, lines per page and approximate printing time), a

printing test and a background layout grid to load into TI-Artist.

G.A.P. requires 32K, disk, Extended BASIC, TI-Artist version 2.0 and an Epson compatible printer. The program is TI/99 and Geneve 9640 compatible, the manufacturer says. It sells for \$15 plus \$1.50 shipping and handling.

For further information, or to order, contact Comprodine, 1949 Evergreen Ave., Fullerton, CA 92635.

## Law enforcement info on GENie

The GENie service has added A.L.E.R.T. (A Law Enforcement RoundTable) to its menu of online services. It is designed for persons in law enforcement and related occupations.

For GENie signup information, call 1-800-638-9636.

## THE MAKING OF A PORTABLE TI

# Myarc disk controller is key to making system work

By JAN JANOWSKI

**This is the third and final installment describing Jan Janowski's portable TI project. Previous installments appeared in the June and July editions.—Ed**

It is now December, 1988, and at Don Jones' yearly social, I am being asked over and over by members of the Chicago Users' Group, "How close are you to success?"

I freely admit that I am stuck, but I add that I am very, very close. Then, in a conversation over other things TI, it hits me — *Why don't I look at my Myarc disk controller?* It might be more compact than the TI disk controller, and be easier to implement. (Remember, I was trying to implement a disk controller DSR.)

I looked inside the DSDD card, and discovered that the Myarc card was much more compact. Maybe it could help me.

I removed all socketed ICs except for the PROM, and reinserted the card, without connecting it to the disk drives.

The results were gratifying, in that it still loaded the DSR, and the RAMdisk worked. I couldn't believe my eyes. It was working. All I had to do was make a plug for the I/O port, for operation when the portable was disconnected from the PEB and its disk controller. Hopefully this would give me the fix that Texas Instruments had mentioned to me in its letter.

The Myarc DSDD disk controller card combined a more efficient layout and a more thorough implementation of the PAL on the board. What's a PAL? A PAL is not only a good friend, but a Programmable Array Logic chip that is of as great or greater importance than the PROM (Programmable Read Only Memory) chip.

PALs can be explained using a piece of paper. Draw 6 AND gates, each with 12 inputs. An AND gate is a digital logic cir-

cuit in which the output of the chip depends on the status of the signals at its input. A positive AND output will go high (digital 1) if all its inputs are high. An active low AND gate output will go low (digital 0) when all its inputs are low.

Concerning the AND gates you've drawn on paper, imagine that you could connect or disconnect some of the inputs of the AND gates, and tie others together, so that one input line could be connected to multiple AND gates. Furthermore, imagine that the outputs of each AND gate are fed back

to the input of each of the 6 AND gate inputs, including itself, and that these outputs can also be programmed to gang multiple lines together. Just think of the possible combinations.

For an equivalent example of what Myarc is doing, look at the schematic of a Horizon RAMdisk. It would be possible to replace chips U19, U3, U18, U20, and U10 with one 20 pin PAL, a 12L6. By the way, the name of the PAL, 12L6, gives an insight as to what function it performs. 12L6 has 6 gates, each with a maximum of 12 active low inputs, and a maximum of 6 outputs. Depending on how the part is programmed (by the designer), he could use any part or all of the device. (In the Horizon RAM-

disk example, you would not have the flexibility of the selectable CRU address, but think of the space, component, and power savings that the implementation of this one chip provided. Incidentally, this is why the Myarc RAMdisk cannot be moved from 1000 CRU; this CRU address has already been burned into a PAL that resides on that card.)

Coincidentally, as soon as I had disassembled the disk controller card, I received an answer to my letter from Lou Phillips, of Myarc, on this. Here is his response:

*The problem is one of memory utilization. In other words, certain programs assume that VDP RAM and pointers to it are set accordingly. Some software uses that info and performs accordingly. Others assume a certain setting. The setting is performed by the FDC (Floppy Disk Controller card) and when it is powered up. One thing you could do is have the ROM for your RAMdisk place a >37d7 in location >8370 of CPU RAM and >AA, >3F, >FF, >11, >03, in VDP RAM starting at location >37D8. That*

*should do it.*

More than two months later, after three revisions of the plug that was to finish this project, I determined that the timing for the data bus on this "dummy plug" is not going to work. About 65 hours of work was put in on this plug and I find that I am at another impasse . . . Darn. (See Fig. 1.)

This project, the making of a portable, sure has had its ups and downs. Just about the time that I feel that everything is going right, I find an obstacle in my path. Fortunately, I have been helped, by the TI community, during my times of need, and I have certainly been in need during this project. Let me now set the stage as to

(See Page 30)

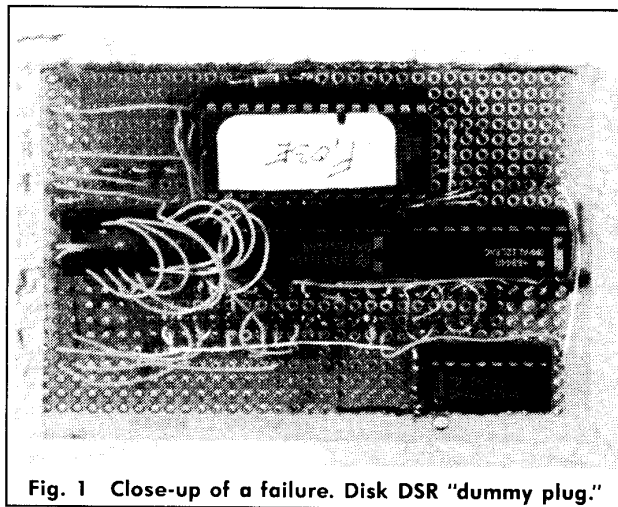


Fig. 1 Close-up of a failure. Disk DSR "dummy plug."

# Get Ready to Do Business Better!

## TRAK-A-CHECK

A program for home or small business finances: with features not found in any other check program.

### FEATURES

Screen prompted entries. 36 Budget categories. Display current balance. Reconcile Bank Statement. Locate Specific transactions. Print transaction or category totals—with optional printer.

## EXER-LOG

Never before Available for the TI99/4A. Written by an M.D., Exer-Log calculates how far you must run after those extra cookies.

### BY DOCTOR RON ALBRIGHT FEATURES

Calculates calories burned for 40 exercises ranging from sleeping to marathon running. Stores and retrieves up to 5 activities per day for an entire year. Recall and display activities for a given date or interval.

## DAILY DIARY

Imagine scheduling a whole years' activities. Daily Diary will be your efficient side and let your mind play.

### FEATURES

Store and retrieve up to 10 hourly appointments for an entire year. Special daily memo slot for birthdays and anniversaries. Print out single day appointments for a full months' calendar with optional printer.

Now Available from **TEX-COMP** at the Incredible Price of **\$5.95 each**

**SPECIAL OFFER!!! BUY TWO--GET ONE FREE..ALL THREE ONLY \$11.95+s&h**



**BUSINESS  
MANAGER**  
YU-CAN BUSINESS

## Save big on home office needs



A COMPLETE SYSTEM FOR THE HOME OFFICE OR SMALL BUSINESS  
PERFECT FOR DISTRIBUTORSHIPS (I.E. AMWAY, AVON, SHAKLEE)  
CHURCH AND FRATERNAL ORGANIZATIONS, AND REAL ESTATE AGENTS!  
ALL THREE PROGRAMS AT ONE SUPER LOW PRICE...ONLY \$7.95+s&h.

### Order Entry & Invoicing

The Point of Sale subprogram will generate a printed invoice for you immediately after entering all order and customer data, or use the Batch Entry option when you require a permanent disk record of your invoices. Either option will work with the Inventory Control program to keep your inventory up to date and automatically print out back-ordered items on your invoices.

### Mail List

This program stores up to 1,000 names and addresses. Adding, deleting, or changing listings is a simple task, and you can design your own format for printing labels. You can also search lists and generate labels and/or reports from any one of nine different fields. This program will work with Order Entry & Invoicing to update your list when billing out to new customers. 32K memory and additional driver are optional. Required. Extended BASIC, RS232, printer.

### Inventory Control

This program will enable you to keep track of up to 1,000 items. Once stored on disk, items can be located by record number, stock number or description, and displayed or printed out for your review.

**NEW LOWER PRICE!!!**

**\$7.95**

This unique collection of programs work together to offer you tremendous versatility.

## TAX TIME SPECIAL

### SELF HELP TAX CUT

A COMPLETE TAX-RECORD KEEPING PROGRAM

USES A JOYSTICK LIKE AN IBM OR APPLE MOUSE TO SELECT VARIOUS CATAGORIES. THIS IS A HIGH POWERED PROGRAM WHICH KEEPS ALL YOUR RECORDS FOR TAX TIME IN A MANNER WHERE YOU CAN GET THEM PRINTED OUT IN THE CATAGORIES YOU NEED. WRITTEN BY A TAX ATTORNEY TO COMPLY WITH ALL IRS RECORD KEEPING REQUIREMENTS. ALL THE LATEST FEATURES INCLUDING ICONS. 32K, EXBASIC REQ.

**NEW LOWER PRICE**

**7.95**

SEND ORDER AND MAKE CHECKS PAYABLE TO

**TEX+COMP**  
Serving the TI-99/4A user since 1980

P O BOX 33084 — GRANADA HILLS CA 91344

TERMS: All prices FOB Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling (\$3.00 minimum) East of Mississippi 4 1/2% (Free shipping on all software orders over \$100.00). Prices and availability subject to change without notice. We reserve the right to limit quantities.

When in the Los Angeles area visit our modern warehouse outlet store where you can purchase all TI items at our regular discount prices. Call for location & hours!



VISA and MASTERCARD  
HOLDERS CALL DIRECT  
**(818) 366-6631**  
24 Hour Order Line

3% for credit card orders

# THE MAKING OF A PORTABLE TI

(Continued from Page 28)

Where I was as of March 1, 1989:

I had succeeded in:

- A. making a battery operated black TI-99/4A console;
- B. putting a RAM disk inside a console;
- C. making an 8 bank "supercart";
- D. implementing a parallel port for this portable.

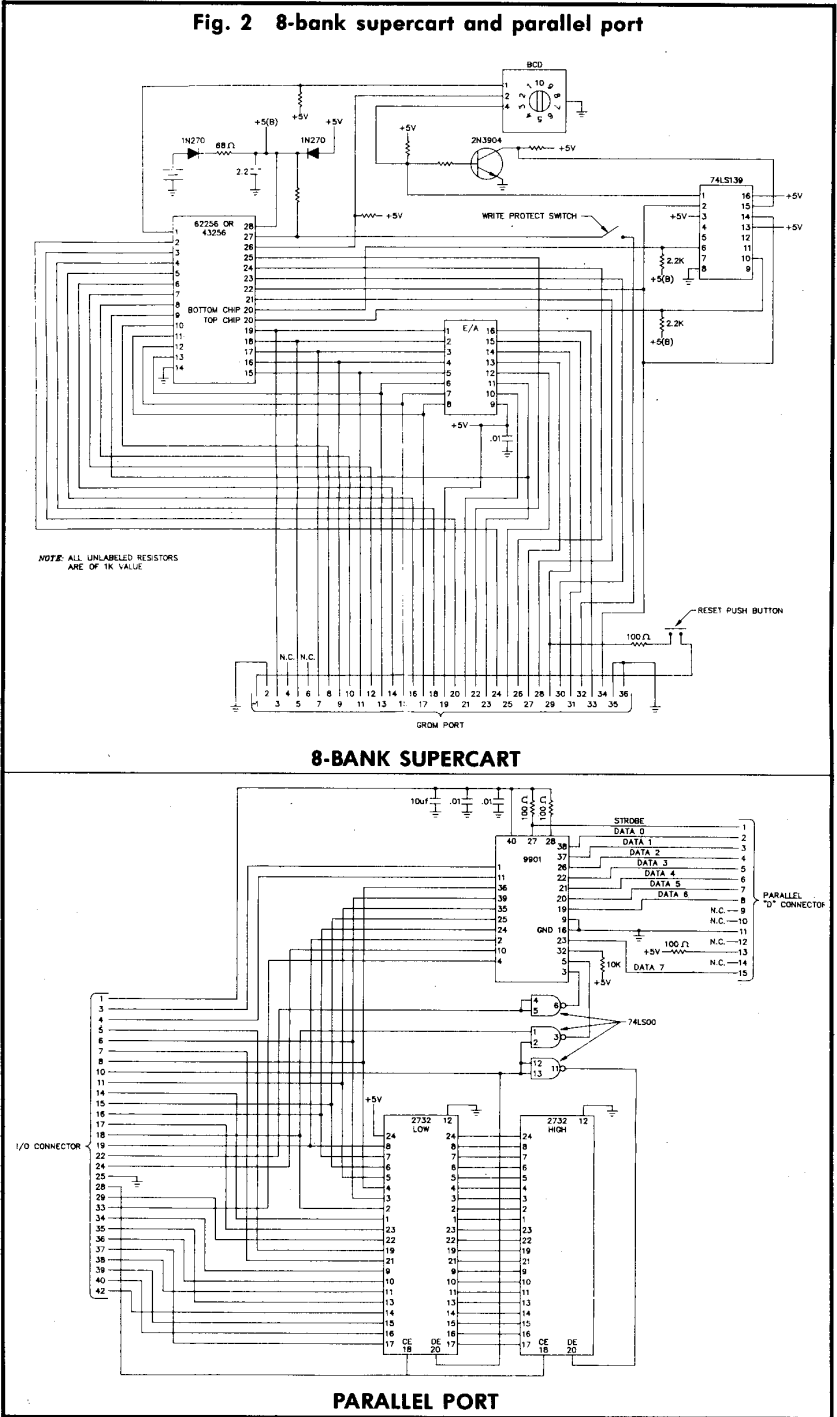
But in doing this, I ran right smack into the TI operating system. From TI's standpoint, what I was trying to do was completely *illegal*. When I use this word, I don't mean that I was breaking any law of any human society. Rather, in attempting to have a disk access without a disk controller card, I was attempting to do something that I would not normally be able to do with my TI computer. *You can't have disk access without a disk controller card*; you need a disk controller provide the necessary DSR, and this is why you lose memory when you add a disk system.

You can try this out for yourself: In Extended BASIC, type in the SIZE command, both with and without a disk system. The disk controller card reconfigures the computer's available memory to a smaller amount, and creates the Device Service Routine in the process.

My basic problem with this is that the disk controller is not present in my portable computer. The built-in RAMdisk alters the VDP RAM so that on power up the MENU program is executed, and that is about it. It assumes that the disk controller is there, but it isn't present on my portable, so what I was attempting to do was entirely illegal.

So here I was, so close to success and simultaneously so near to failure. Then somehow, word of my problem got out. I was left a message from Barry Boone on "The Chicago Connection" BBS (312-453-7831). I called Barry and found he had been having problems similar to mine, but for a different reason. He had modified his ROS (RAMdisk Operating System) to fix his problem, and he felt a patch to the 7.3 ROS might work.

Barry is a software fella and I am a hardware fella. I have the greatest respect for the Barry Boone's and Jim Derk's of the TI community. They can look at a problem and re-design the software to work around



it. I can do some hardware re-designing, but I am exceptionally weak in the software area. Though I knew what was wrong, and though I knew where the problem lay, I

didn't have the foggiest idea of how to fix it with software. This is why I was concentrating on a "dummy plug," to emulate a (See Page 32)

# Star<sup>★</sup> Printer Bonus!

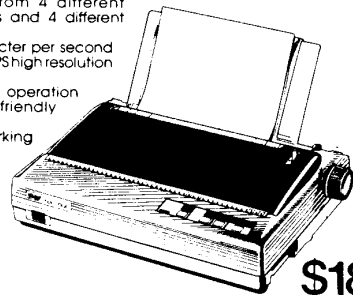
MICRONICS

Buy A Star Printer **NX-1000**  
And Get . . . . **Multi-Font**

- The Most Advanced Printhead
- Letter Quality Type
- High Speed Operation
- Sophisticated Paper Handling
- Full TI<sup>®</sup> Compatibility

**9-Pin Dot Matrix Computer Printer with Near-Letter Quality Print Mode**

- choose from 4 different type styles and 4 different sizes
- 144 character per second draft, 36 CPS high resolution printing
- soft-touch operation with user-friendly panel
- paper parking lets you use both tractor feed and single-sheet paper



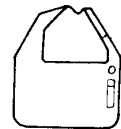
**\$189<sup>95</sup>**

+S&H

**Plus \$100 In FREE**

**Accessories, Software & Discounts.**

TEX-COMP has a great deal in store for you when you buy a STAR printer from us. With your purchase you will receive a free package of printer accessories and discounts on printer related software for the TI-99/4A with a total value of over \$100. For starters, you will receive free a \$19.95 copy holder, a \$9.95 copy of 99 Writer II, the disk version of TI Writer, a \$19.95 copy of Better Banners and the \$9.95 Better Banners Companion, a \$4.95 copy of the TEX-Comp STAR Demo disk, a \$7.95 spare ribbon and a \$9.95 Head brand printer care kit. In addition, you also receive a \$5 discount on a printer stand (reg \$14.95), printer cable (reg. \$24.95), and a RS232 card or CorComp PIO printer interface. All discounts must be taken at the time of the printer is ordered.



copy holder

Here's the printer with the features you've been waiting for.

**A VERSATILE SELECTION OF FONTS AND TYPE STYLES**

The NX-1000 gives you plenty of options for attractive and creative text printing with Courier, Sanserif, Orator I and Orator 2 type styles, in a choice of Pica, Elite, Condensed Pica and Condensed Elite sizes. In addition, Italic Printing is available in all print modes.

**HIGH-RESOLUTION NLO AND DRAFT PRINTING**

Star's micro-precision engineering allows the NX-1000 to deliver excellent near letter-quality printing results at 36 cps, plus very presentable draft quality at 144 cps printing speed.

**STRAIGHTFORWARD OPERATION WITH USER-FRIENDLY PANEL**

The operator panel on the NX-1000 is extremely easy to use and enables soft-touch selection of

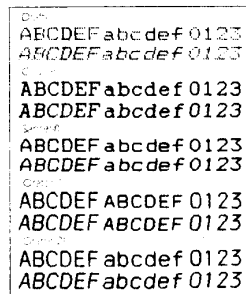
specific printing requirements. It also comes equipped with LED indicators for instant confirmation of power, type style, print pitch and on-line status.

**PAPER PARKING GIVES YOU THE BEST OF BOTH WORLDS**

You don't have to remove the tractor feeder when you want to print onto a single sheet of paper. With the NX-1000's paper parking function, you can take full advantage of tractor feeding while hanging on to the versatility that single sheet feeding provides.

**WIDELY COMPATIBLE, HIGHLY CAPABLE AND VERY COMPETITIVE**

Featuring Epson-based control codes in the Standard mode and IBM Proprinter II in the IBM mode, the NX-1000 will perform outstandingly well with a host of different computer systems. And, with extra features like enlarged and proportional printing, it easily outdistances most other printers in its class.



**RATED "A" (BEST) IN MICROPENDIUM MARCH 1989**

**THE STAR NX1000 RAINBOW COLOR PRINTER IS ALSO AVAILABLE WITH THIS SPECIAL BONUS OFFER AT \$269.95 + s&h.**

Send order and make checks payable to

**TEX-COMP**



PO BOX 33004 - GRANADA HILLS, CA 91344

TERMS: All prices F.O.B. Los Angeles. For fastest service use cash, check or money order. Add 3% shipping and handling (\$3.00 Minimum). East of Mexico add 4 1/2% Add 3% for Credit Card orders. Prices and availability subject to change without notice.



VISA and MASTERCARD  
HOLDERS CALL DIRECT  
**(818) 366-6631**  
24 Hour Order Line

NOTE: Payment in full must accompany all orders. Credit card, Company check or Money order for immediate shipment. Personal Checks require up to 4 weeks to clear. California orders add 6 1/2% sales tax.

## THE MAKING OF A PORTABLE TI

(Continued from Page 30)

disk controller. (In the long run, I am glad it didn't work, as I would later find another need for that I/O port.)

As a result of our communications, Barry sent me a modified ROS, P-ROS, to be loaded instead of ROS on a RAMdisk, to allow that RAMdisk to function without a disk controller card. Wouldn't you know it, it worked! My portable TI worked as if it had a disk controller inside the console. The RAMdisk operates flawlessly, both as a portable, and when attached to an expansion box.

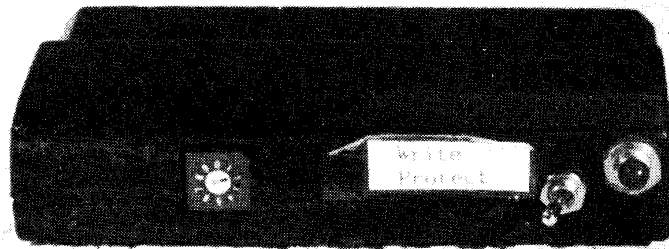
I later asked Barry if he could explain what he had done, and his explanation is as follows:

*The modifications made to P-ROS were simple sector edits, which accomplished the following: On powerup, set the value at >8370 and initialize the disk buffers. Since this mod was made without source code, the only "drawback" is that the powerup feature must be turned on... (definitely not a problem if you use MENU). The only other incompatibility problem will be with those programs that do a CALL FILES or equivalent to re-partition the disk buffers, since the ROS does not contain those routines.*

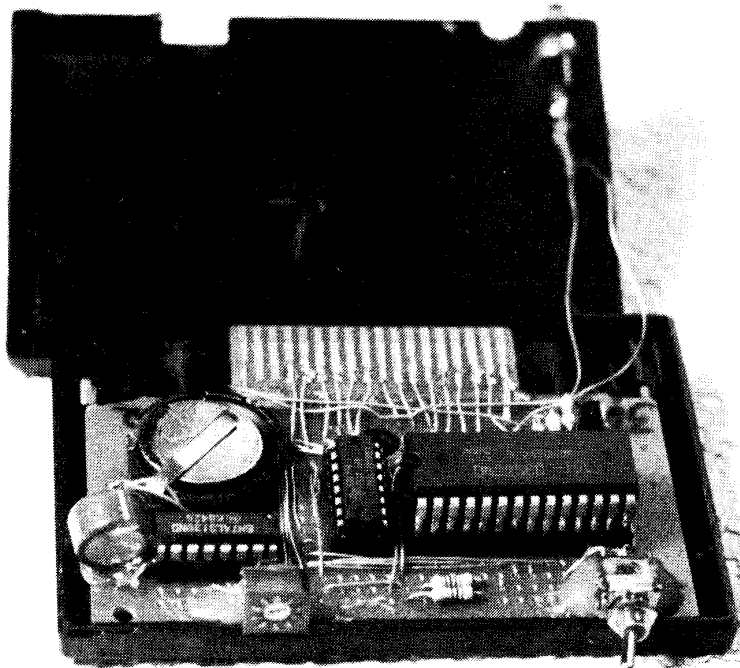
With this major stumbling block out of the way, I proceeded to install the parallel port inside the console. After the installation, everything seemed to be just fine. However, another critical problem appeared: The parallel port worked fine as a portable, but, when connected to the expansion box and powered-up, the disk controller card and the parallel port were fighting for control of the computer, and neither was winning. The parallel port worked fine in the portable when it alone was connected to the I/O slot, so it was decided that the parallel port would remain a device that would plug into the I/O slot and it would be used as needed. That was a workable solution. Incidentally, the Chicago Users Group's Jim Derk is writing the code for the parallel port. Because of this, we here in Chicagoland will be creating our own custom parallel ports. (See Fig. 2, the 8-bank supercart and parallel port).

With this last change, everything now works just as it was planned, and I believe that this project is a resounding success.

Fig. 3 8-bank supercart



8-BANK SUPERCART WRITE PROTECT SWITCH AND RESET BUTTON



8-BANK SUPERCART

All the programs I have wanted to use are available to me, and they load with lightning speed. So, success has smiled upon me at last.

But now, how can I spread the word? I decided to invest in having the schematic of the portable done on a CAD workstation, to make it as clear and concise as possible. Some of you received the results of my work at the April Chicago User Group meeting. (If you did not get a copy of this information, don't fret; just wait until you finish this article.) Also, copies of these schematics were sent to all parties who assisted me with this project. I received some

input from these people I wish to share with you. John Johnson, the author of MENU and the ROS, sent some beta software for MENU and included information to the effect that release 7.4 would be written to auto configure for portable or standard TI systems.

My original intention was that this portable would take advantage of the TV sets in motel rooms or offices, but I decided to look into LCD TV's (Liquid Crystal Display), and see if a large color LCD TV existed with a video input. There are such units, but the cost is high, so I am waiting

(See Page 34)

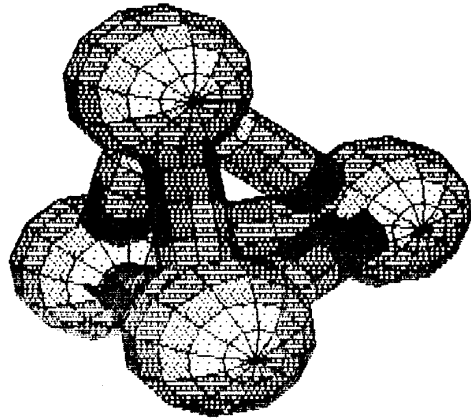


**McCann Software  
Presents**

# TPA for MDOS

The Printer's Apprentice for MDOS features an all new Picture Editor that takes advantage of the Geneve's large memory and advanced video display processor. The picture-page size has increased from the 256x192 on the 99/4A to 1024x768. This means you can draw and enter text on a full double density size page just by scrolling the 512x192 editing window. You can enter text vertically or horizontally using fonts from TPA, CHARA, TI-Artist(tm) or CGSD(tm). You can use instances or "P" pictures from TI-Artist clip art libraries. In fact, TPA's enlarged picture-page means you can load up 16 "P" pictures at once then scroll around and view or edit every pixel of those 16 pictures. Of course, there is no limit to the number of instances, pictures or font characters you can use because its all true WYSIWYG. With TPA's proportionally spaced fonts you can get good looking text without any restrictions on column alignment. You can copy or move any rectangular area around the picture-page and draw, enter text and then print all or any part of the picture-page using TPA's handy Cpixel enlarger. The printing direction may be portrait or landscape(turned sideways). The printing density may be single, double or quad (if your printer supports it.) Additionally, you may single or double strike your printing for the perfect page. You may save all or any portion of the page to diskette in picture format or in TPA "extrn" format for use with the TPA Scheduler. Basic drawing features include lines, polygons, ellipses, curves, and rectangles. A "flood-fill" function allows for easy shading of areas with built-in or user defined shading patterns. A magnify function allows precise editing of any part of TPA's huge picture-page. A number of advanced features such as invert, enlarge, mirror, rotate and translate add powerful capabilities in page creation. We think this is the type of program that the Geneve was made for. TPA for MDOS also includes improvements in the most powerful portion of TPA the Formatter and Scheduler, combining them into single unit. When you really get serious about good looking text there is no program available on 99/4A that does it better than TPA. Now for MDOS on the Geneve, TPA moves page creation into a whole new dimension.

TI-Forth for MDOS	\$15.00
The Geometer's Apprentice(TGA)	\$39.95
The Printer's Apprentice(TPA)	\$22.50
TPA Toolbox	\$22.50
TPA Fonts Disk I	\$11.50
TPA Fonts Disk II	\$11.50
Business Graphs 99	\$15.95



Our products for the 99/4A including The Printer's Apprentice, The Geometer's Apprentice, TPA Toolbox and Business Graphs 99 require: TI-99/4A with 32K memory, Disk System, and TI-Extended BASIC or Editor Assembler. Our products for MDOS including The Printer's Apprentice, The Geometer's Apprentice and TI-Forth for MDOS on the Geneve 9640 by Myarc require version 1.14 of MDOS. All products print on TI-99/4A printer, Gemini 10K and other 100% Epson compatible graphics printers including Panasonic 1091, Star NX and IBM Graphics Printer. When ordering TPA please specify 99/4A or MDOS version.

Send check or money order to:  
**MCCANN SOFTWARE**  
**P.O. BOX 34160**  
**Omaha, NE 68134**

## THE MAKING OF A TI PORTABLE

(Continued from Page 32)

for technology to catch up with me. When I am able to get what I want, at a reasonable price, I will make a cover that incorporates a LCD TV in it. The bottom of the console will be expanded to include the batteries and power transformer, with a small drawer for a cartridge or two. At present, TI Extended BASIC and the supercart are the only cartridges I use, but I usually take along Video Chess for relaxation.

I have not dwelled on my supercart because so many articles have been written about them. The schematic included here is of a model that has been used for many months, and it is able to successfully store 8 separate programs. It also fits inside a standard cartridge, even with IC sockets included. (See Fig. 3).

So I have finally succeeded in doing what I started out to do. Furthermore, I have made some very good friends in the process, and all of the people who assisted me with this project have had the same attitude about this project, relative to the TI community: *Make the information available to all.* We, as a group, are forever assisting one another, and we form a closer organization by this mutual assistance. I want to

thank the following people for their assistance and suggestions to me for making this project a reality:

Jim McCulloch, Jim Derk, Hank Ellermann, Don Jones, Don Walden, Bud Mills, Ron Walters, George Bowman, Mike Maksimik, and Hal Shanafield. A special "thank you" goes to Barry Boone and John Johnson. These names are entered chronologically, and reflect the time period

**Readers who are interested in pursuing this project should send a DSDD disk (two SSSD disks), and a 8x11, postage-paid return envelope to Jan Janowski. He will provide schematics, a copy of P-ROS and MENU software.**

that these people assisted. Obviously, many people helped over, and over. My thanks go out to every one of you. This project is not "Jan Janowski's Portable project," rather it is the TI community's portable project.

Bud Mills, who markets the Horizon

RAMdisk, has mentioned that he is considering making a board available for this project. He says that it may be able to use 32K or 128K memory chips. Keep an eye out for this one, as it will make the project a lot simpler.

At the Chicago TI Users' Group's Faire, which is held each November, I will be giving a demo of the portable at one of the breakout meetings, and if you would want some "hands on" access to the portable, feel free to ask to use it. (Who knows what will be in it by then.) For more information on the Faire, check on the Chicago TI Users' Group's BBS at (312)862-0182, for directions and schedule information.

If you would want a copy of all these articles, along with photostats of the schematics used (power supply, RAMdisk, 8-bank supercart, as well as a copy of "The Making of a Portable" article, along with the P-ROS, and "beta" MENU software) send a formatted disk (2 if you are still using SSSD), and 8x11 envelope with return postage for disks and the photostats to: Jan Janowski, TI PORTABLE INFO, 8536 N. Keystone, Skokie, Ill 60076.

I will make copies for you, and send them back. I LOVE MY (PORTABLE) TI.

## A CHARACTER GENERATOR FOR GENEVE & TI99/4A

# Final installment of source code

This is the third and final installment of CHARAIFIX. Previous installments were published in June and July

The assembly language program, by Wayne Stith, requires a memory expansion, disk system and Editor/Assembler. The program is used to customer CHARAI files used with TI-Writer, MY-Word and other programs. After creating characters, the program automatically saves the result as a CHARAI file.

Information on how to assemble and use the program appeared in June and July.

### CHARAIFIX

```

0905
0906 QUIT CLR @B3C4. Kill ISR hook
0907 BLP @ Reset system
0908
0909 * Interrupt routine
0910
0911 MYINT1 CLR R8 Clear R8 of GPL workspace
0912 LWP >B3C0 Load interrupt workspace
0913 MOV R13,@INTREG+26 Move return data to my workspace
0914 MOV R14,@INTREG+28
0915 MOV R15,@INTREG+30
0916

```

```

0917 LWPI INTREG Load my interrupt workspace
0918
0919 DEC R10 Decrement timer
0920 JNE MYEXIT If not 0, then exit
0921
0922 * Set VDP write address
0923
0924 MOV *R13,R0 Fetch screen location from main program
0925 AI R0,>4000 Set first bits to 0!
0926 SWPB R0
0927 MOVB R0,@8C02 Send low byte of original address
0928 SWPB R0
0929 MOVB R0,@8C02 Send high byte
0930
0931 LI R10,5 Reset timer
0932 MOV R8,R8 Check flag for character/cursor
0933 JEQ MYINTA
0934
0935 CLR R8 Clear flag for next time
0936 LI R0,>1E00 Load cursor
0937 JMP MYINTB
0938
0939 MYINTA MOV @2(R13),R0 Fetch R1 value from main program
0940 SETO R8 Set flag for next time
0941 MYINTB MOVB R0,@8C00 Send value to screen

```

(See Page 35)

## CHARAIFIX—

(Continued from Page 34)

```

0942
0943 MYEXIT RTWP      Return directly to main program
0944
0945 * Routine to display the character in a grid
0946
0947 BOXWRT DATA >8300,BOX1  Vector; use scratchpad for workspace
0948
0949 * Multiply the character number by 8; add >E000 to obtain the starting
0950 * address for the 8-byte pattern
0951
0952 BOX1  MOV  @CURCHR,R7
0953        MPY  @EIGHT,R7
0954        AI   R8,>E000
0955        MOV  R8,R9      Save starting address
0956        AI   R9,8      Point to beginning of next character's pattern
0957
0958        LI   R0,114+>4000  Top left corner of grid (leading bits
0959 *          already adjusted)
0960
0961 * Each of the 8 pattern bytes is represented in one line of the grid.
0962 * It is easier to work with the patterns if we handle one nybble at
0963 * a time. BOXDAT contains the 16 ways in which a nybble can show up
0964 * as a half line. We will take the left nybble first.
0965
0966 BOX4  MOVB *R8,R3      Fetch the byte
0967        SRL  R3,12      Put left nybble in low byte
0968        MPY  @FOUR,R3    Multiply by 4 to obtain an offset for BOXDAT
0969        AI   R4,BOXDAT   Add the beginning of the table
0970        LI   R2,4        Loop counter
0971
0972        SWPB R0          Set VDP address
0973        MOVB R0,@>8C02
0974        SWPB R0
0975        MOVB R0,@>8C02
0976
0977 BOX2  MOVB *R4+,@>8C00  Send 4 bytes to screen (left 1/2 line)
0978        DEC  R2
0979        JNE  BOX2
0980
0981        MOVB *R8+,R3     Fetch same character byte
0982        SRL  R3,8        Place it in the low byte
0983        ANDI R3,>000F    Eliminate everything but the right nybble
0984        MPY  @FOUR,R3    Get an offset
0985        AI   R4,BOXDAT   Add beginning of table
0986        LI   R2,4        Loop counter
0987
0988 BOX3  MOVB *R4+,@>8C00  Send 4 bytes to the screen (right 1/2 line)
0989        DEC  R2
0990        JNE  BOX3
0991
0992        AI   R0,32      Point to next line on screen
0993        C    R8,R9      Gone far enough?
0994        JNE  BOX4      No
0995        RTWP          Yes, go home
0996
0997 *****
0998
0999 * Routine to display the current character
1000
1001 LITTLE DATA >8300,LIT1  Vector
1002
1003 LIT1  MOV  @CURCHR,R0  Fetch character
1004        MPY  @EIGHT,R0  Obtain an offset
1005        AI   R1,>E000    Now points to character pattern
1006
1007 * Redefine CHR$(128) by writing this pattern to the pattern
1008 * descriptor table.
1009
1010        LI   R0,128*8+>800
1011        LI   R2,8
1012
1013        BLWP @VMBW
1014
1015        LI   R0,231      Display the character on screen
1016        LI   R1,128*256 (Not really necessary since the character
1017        BLWP @VSBW      is already there!)
1018        RTWP
1019 *****
1020
1021 * Routine to display the hex string
1022
1023 HEXDIS DATA >8300,HEX1  Vector
1024
1025 HEX1  MOV  @CURCHR,R5
1026        MPY  @EIGHT,R5
1027        AI   R6,>E000    Point to character's 8-byte pattern
1028
1029        MOV  R6,R9
1030        AI   R9,8        Point to next pattern
1031
1032        LI   R0,>0842    Set VDP address (>0208)
1033        MOVB R0,@>8C02
1034        SWPB R0
1035        MOVB R0,@>8C02
1036
1037 * The 8-byte pattern will show up on screen as 16 numbers/letters.
1038 * Each byte must be broken into two nybbles to display.
1039
1040 HEX2  MOVB *R6,R3      Fetch a byte
1041
1042 * The next instruction not only places the nybble in the low byte, it
1043 * also fills the left bits with zeros, thus making R3 perfect as an
1044 * index value.
1045
1046        SRL  R3,12
1047        MOVB @HEX(R3),@>8C00  Send a byte from HEX to the screen
1048        MOVB *R6+,R3      Get the same byte again
1049        SRL  R3,8        Put the right nybble in the low byte
1050        ANDI R3,>000F    Clean out all but the right nybble
1051        MOVB @HEX(R3),@>8C00  Send a byte to the screen
1052
1053        C    R6,R9      Gone far enough?
1054        JNE  HEX2
1055        RTWP
1056
1057 * Routine to convert the hex string to DATA and store it
1058
1059 HEXNR  DATA >8300,HEX5
1060
1061 HEX5  MOV  @CURCHR,R5
1062        MPY  @EIGHT,R5
1063        AI   R6,>E000    Point to where the string will end up
1064        MOV  R6,R7
1065        AI   R7,8        Point to the next character's pattern
1066
1067        LI   R0,>0208    Set VDP address for reading the hex string
1068        SWPB R0
1069        MOVB R0,@>8C02
1070        SWPB R0
1071        MOVB R0,@>8C02
1072
1073 * The 16-byte screen string must be converted to 8 bytes.
1074
1075 HEXSA  MOVB @>8B00,R3  Fetch one byte from screen
1076
1077        LI   R0,HEX     Loop through HEX until a match is found
1078        HEX6  CB  R3,*R0
1079        JEQ  HEX7
1080        INC  R0
1081        JMP  HEX6

```

(See Page 36)

# CHARAIFIX—

(Continued from Page 35)

```

1082
1083 * By subtracting HEX from the value in R0, a true binary value is obtained
1084 * which represents the left nybble of the byte we are creating.
1085
1086 HEX7 LI R1,HEX
1087 S R1,R0
1088
1089 SLA R0,12 Put the value in the far left nybble
1090 MOVB R0,*R6 Store the whole byte
1091
1092 MOVB @>8000,R3 Fetch the next byte from the screen
1093 LI R0,HEX Find a match
1094 HEXB CB R3,*R0
1095 JEQ HEX9
1096 INC R0
1097 JMP HEX8
1098
1099 HEX9 S R1,R0 Gets the binary value
1100 SLA R0,8 Place it in the right nybble of high byte
1101
1102 * The next instruction will set all bits of the target byte pointed to
1103 * by R6 according to the value in the left byte of R0. Other bits are
1104 * not affected.
1105
1106 SOCB R0,*R6+
1107 C R6,R7 Gone far enough ?
1108 JNE HEX5A
1109 RTWP
1110
1111 * Routine to read the grid and update the character pattern stored.
1112
1113 BOXRD DATA >8300,BOX7
1114
1115 BOX7 MOV @CURCHR,R7
1116 MPY @EIGHT,R7
1117 AI R0,>E000
1118 MOV R0,R9 Point to beginning of 8-byte pattern
1119 AI R9,8 Point to next character's pattern
1120
1121 LI R0,114 Set VDP address to read grid
1122 BOX7B SWPB R0
1123 MOVB R0,@>8C02
1124 SWPB R0
1125 MOVB R0,@>8C02
1126
1127 LI R3,8 Loop counter
1128
1129 * To create a byte for the character pattern buffer, each of the 8 bytes
1130 * on a line of the grid must be read. These bytes can be only ASCII 0
1131 * or 8. If a character is 0, then a bit is cleared in the byte of the
1132 * character pattern to which R0 points. If the character is 8, a bit is 5
1133
1134 LI R1,>8000 Used to set bits, begins with high bit
1135 BOX7A MOVB @>8000,R2 Fetch a byte from the screen
1136 JEQ BOXB CHR8(0) ?
1137
1138 SOCB R1,*R0 No, set a bit in the buffer
1139 JMP BOX9
1140
1141 BOX8 SZCB R1,*R0 Yes, turn off a bit in the buffer
1142 BOX9 SRL R1,1 Move the bit one space to the right
1143
1144 DEC R3 Done all 8 characters on the line ?
1145 JNE BOX7A No
1146
1147 AI R0,32 Yes, point to next screen line
1148 INC R0
1149 C R0,R9 Finished whole grid ?
1150 JNE BOX7B

```

```

1151 RTWP
1152
1153 * Utilities
1154
1155 KSCAN DATA REGSV,KSC
1156 KSC LWPI >83E0
1157 BL @>000E
1158 LWPI REGSV
1159 RTWP
1160
1161 VMBW DATA REGSV,V1
1162 REGSV DATA 0,0,0,>8C02
1163 DATA >8C00,0,>8000,0
1164 DATA >4000,>8000,0,0
1165 DATA 0,0,0,0
1166
1167 V1 MOV R13,R7
1168 MOV *R7+,R0
1169 MOV *R7+,R1
1170 MOV *R7+,R2
1171
1172 SWPB R0
1173 MOVB R0,*R3
1174 SWPB R0
1175 SOC R0,R0
1176 MOVB R0,*R3
1177 NOP
1178 V2 MOVB *R1+,*R4
1179 DEC R2
1180 JNE V2
1181 RTWP
1182
1183 VSBW DATA REGSV,V3
1184 V3 MOV R13,R7
1185 MOV *R7+,R0
1186 SWPB R0
1187 MOVB R0,*R3
1188 SWPB R0
1189 SOC R0,R0
1190 MOVB R0,*R3
1191 NOP
1192 MOVB *R7,*R4
1193 RTWP
1194
1195 VMTR DATA REGSV,V4
1196 V4 MOV *R13,R0
1197
1198 SOC R0,R0
1199
1200 SWPB R0
1201 MOVB R0,*R3
1202 SWPB R0
1203 MOVB R0,*R3
1204 RTWP
1205
1206 VSBW DATA REGSV,V5
1207 V5 MOV R13,R7
1208 MOV *R7+,R0
1209 SWPB R0
1210 MOVB R0,*R3
1211 SWPB R0
1212 MOVB R0,*R3
1213 NOP
1214 MOVB *R6,*R7
1215 RTWP
1216
1217 VMBR DATA REGSV,V6
1218 V6 MOV R13,R7
1219 MOV *R7+,R0
1220 MOV *R7+,R1
1221 MOV *R7+,R2
1222 SWPB R0

```

```

1223 MOVB R0,*R3
1224 SWPB R0
1225 MOVB R0,*R3
1226
1227 V7 MOVB *R6,*R1+
1228 DEC R2
1229 JNE V7
1230 RTWP
1231
1232 DSRLNK DATA REGSD,D1
1233 REGSD DATA 0,0,0,0,0,0,0,0
1234 DEVA DATA 0,0,0,0,0,0,0,0,0,0
1235 DCRU DATA 0
1236 DSENT DATA 0
1237 DLEN DATA 0
1238 DPAB DATA 0
1239 DVERS DATA 0
1240 DEY DATA 0,0,0,0
1241 PERIOD TEXT ''
1242 HEXAA BYTE >AA
1243 DFLAG DATA 0
1244
1245 D1 CLR @DFLAG
1246
1247 MOV *R14+,*R5
1248 SZCB @SET,R15
1249 MOV @>8356,R0
1250 MOV R0,R9
1251 AI R9,-8
1252 BLWP @YSBR
1253 MOVB R1,R3
1254 SRL R3,8
1255 SETO R4
1256 LI R2,DEV
1257 D2 INC R0
1258 INC R4
1259 C R4,R3
1260 JEQ D3
1261 BLWP @YSBR
1262 MOVB R1,*R2+
1263 CB R1,@PERIOD
1264 JNE D2
1265 D3 MOV R4,*R4
1266 JEQ D08
1267 C1 R4,7
1268 JGT D08
1269 CLR @>83D0
1270 MOV R4,@>8354
1271 MOV R4,@DLEN
1272 INC R4
1273 A R4,@>8356
1274 MOV @>8356,@DPAB
1275 D4 LWPI >83E0
1276 CLR R1
1277 LI R12,>1100
1278 D5 MOV R12,R12
1279 JEQ D55
1280 SBZ 0
1281 D55 AI R12,>0100
1282 CLR @>83D0
1283 C1 R12,>2000
1284 JEQ DX
1285 MOV R12,@>83D0
1286 SBO 0
1287 LI R2,>4000
1288 CB *R2,@HEXAA
1289 JNE D5
1290 A @DEVA,R2
1291 JMP D66
1292 D6 MOV @>8302,R2
1293 SBO 0

```

(See Page 37)

# Another approach to a full-screen forth editor

By LUTZ WINKLER

The screens published here are for use with the Advanced Video Processor Card manufactured by Dijit Systems.—Ed

The Text 2 (80-column) mode of the 9938 chip allows the use of 4 colors to be displayed simultaneously. In my original version of a full-screen Forth editor (MICROpendium, June 1988) I used the second set of colors for the blinking cursor. Here is a modified version of the same editor.

Editing functions remain unchanged but the display shows the screen number and the line ruler across the top in a different color (which you may select). The number of the line on which the cursor is currently located is highlighted in the same colors and, of course, the cursor is shown in those colors as well. It no longer blinks but by proper choice of colors it should be easy to see. My normal display colors are grey on white and for the second colors I use black on yellow. By altering 1A on line 8 of screen 35 you can set any color you wish. When you leave the edit mode (FCTN-9) the alternate colors are turned off, which gives an immediate indication that you are back in interactive mode.

Screens 36 and 38 are not shown again as they remain the same as before, except that you change EDITORA (2 occurrences on screen 38) to EDITORB to conform to the name I used on screen 34. This was done only to distinguish it from the other version with the blinking cursor.

The only addition is the word HEADR, which you should be able to insert ahead of SCRNF (screen 35). The words that have been modified are: CUR, RULER, LINE#, SCRNF, UNBLINK, BLINK and QEDIT. (While BLINK and UNBLINK really do not apply in that sense any more, I kept those names.)

```
SCR #34
0 ( AVPC EDITOR B - 1/5 CURSOR CONTROL          21JUN89 LW )
1 BASE->R HEX
2
3
4 VOCABULARY EDITORB IMMEDIATE EDITORB DEFINITIONS
5
6 : !CUR 0 MAX B/SCR 400 * 1- MIN R# ! ;
7 : +CUR R# # + !CUR ;
8 : PTR SCR # B/SCR * R# # 400 /MOD ROT + BLOCK + ;
9 : R/C R# # 40 /MOD ;
10 : .CUR R# # 40 /MOD 3 + SWAP 8 + SWAP GOTOXY ;
11 : +.CUR +CUR .CUR ;
12 : !BLK PTR C! UPDATE 1 +.CUR ;
13 : +LIN R# # 40 / + 40 * !CUR ;
14
15 R->BASE -->
```

```
SCR #35
0 ( AVPC EDITOR B - 2/5 SCREEN FORMATTING, NEXT/PREV. SCREEN )
1 BASE->R HEX
2 : .SCR# CLS DUP SCR ! 3 0 GOTOXY ." SCREEN " . ;
3 : RULER 9 1 GOTOXY 7 1 DO 8 SPACES I . LOOP CR
4 : 8 2 GOTOXY 6 0 DO ." ----!----0" LOOP ." ----" ;
5 : LINE# 0 3 GOTOXY 10 0 DO I 5 .R CR LOOP ;
```

```
6 : LINE. DO I SCR # (LINE) I 50 * F8 + SWAP VMBW LOOP ;
7 : MLINE 10 0 LINE. ;
8 : HEADR 1A C VWTR 40 D VWTR A00 DUP 1 7F VFILL 1+ 1 FF VFILL
9 : A15 8 FF VFILL ;
10 : SCRNF .SCR# HEADR RULER LINE# MLINE ;
11 : NEWSCR 0 SWAP SCRNF !CUR .CUR ;
12 : +SCR SCR # 1+ DISK_HI # 1- MIN NEWSCR ;
13 : -SCR SCR # 1- 0 MAX NEWSCR ;
14
15 R->BASE -->
```

```
SCR #37
0 ( AVPC EDITOR B - 4/5 ERASE, BLINK, AUTOREPEAT DELAY, QUIT )
1 BASE->R
2 HEX
3 : .BL PTR R/C DROP 40 SWAP - BL FILL ;
4 : D>END PAD 40 BLANKS PTR PAD 40 R/C DROP - CMOVE ;
5 : UNBLINK A1E F1 0 VFILL ;
6 : BLINK CURPOS # 1+ 8 /MOD A00 + SWAP DUP
7 : 0= IF DROP 1- 1 ELSE 100 SWAP SRL THEN SWAP VSBW
8 : CURPOS # 50 / A * A00 + 1 18 VFILL ;
9 : DELAY 500 0 DO LOOP ; ( auto-repeat key rate )
10 : BOX 10F7 10F1 DO 00 I VSBW LOOP ;
11 : REBOX 10F8 10F0 DO FF I VSBW LOOP ;
12 : QEDIT REBOX A00 10F 0 VFILL 0 12 GOTOXY QUIT ;
13 : CHECK DUP 1F > OVER 7F < AND IF DUP EMIT DUP !BLK
14 : ELSE 7 EMIT THEN ;
15 R->BASE -->
```

To complete the setup for 80-column mode, here are the screens for VLIST and DUMP which were promised in June 1988 but never appeared:

```
SCR #42
0 ( DUMP ROUTINES 12JUL82 LCT AVPC mod. 22APR88 LW )
1 0 CLOAD VLIST BASE->R HEX
2 : DUMPB -DUP
3 : IF
4 : BASE->R HEX 0 OUT ! SPACE OVER 4 U.R OVER OVER
5 : 0 DO
6 : DUP # 0 <# # # # BL HOLD BL HOLD #> TYPE 2+ 2
7 : +LOOP
8 : DROP VDPME # 1 = IF 1F ELSE 38 THEN OUT # - SPACES
9 : 0 DO
10 : DUP C# DUP 20 < OVER 7E > OR IF DROP 2E THEN EMIT 1+
11 : LOOP CR R->BASE
12 : THEN ;
13
14
15 -->
```

```
SCR #43
0 ( DUMP ROUTINES 12JUL82 LCT AVPC mod. 22APR88 LW )
1 : DUMP CR 00 VDPME # 7 = IF 10 ELSE 8 THEN U/ >R SWAP R -DUP
2 : IF 0 DO VDPME # 1 = IF 8 ELSE 10 THEN DUMPB PAUSE
3 : IF SWAP DROP 0 SWAP LEAVE THEN
4 : LOOP
5 : THEN SWAP DUMPB DROP ;
6 : .S CR SP# 2- SO # 2- ." ; " OVER OVER = 0= IF
7 : DO I # U. -2 +LOOP ELSE DROP DROP ENDIF ;
8
9 : VLIST 80 OUT ! CONTEXT # #
10 : BEGIN DUP C# 3F AND OUT # +
11 : VDPME # 1 = IF 25 ELSE 4A THEN
12 : > IF CR 0 OUT ! ENDF
13 : DUP ID. PFA LFA # SPACE DUP 0= PAUSE OR
14 : UNTIL DROP ;
15 R->BASE
```

## CHARAIFIX— (Continued from Page 36)

1294 D66	MOV #R2,R2	1302	JNE D6	1310	MOV R1,@DVERS	1318	BLWP @VSDR	1326	SOCB @SET,R15
1295	JEQ D5	1303	SRL R5,B	1311	MOV R9,@DSENT	1319	SRL R1,13	1327	RTWP
1296	MOV R2,@B3D02	1304	LI R6,DEV	1312	MOV R12,@DCRU	1320	JNE D9	1328 0X	MOV @DFLAG,@DFLAG
1297	INCT R2	1305 D7	CB #R6+,*R2+	1313	BL #R9	1321	RTWP	1329	JNE D8
1298	MOV #R2+,*R9	1306	JNE D6	1314	JMP D6	1322 D8	LWPI REGSD	1330	SETO @DFLAG
1299	MOV @B355,*R5	1307	DEC R5	1315	SBZ #	1323 D88	CLR R1	1331	LI R12,@F#
1300	JEQ D77	1308	JNE D7	1316	LWPI REGSD	1324 D9	SWPB R1	1332	JMP D5
1301	CB R5,*R2+	1309 D77	INC R1	1317	MOV R9,#	1325	MOV R1,*R13	1333	SLAST END

## Chainlink

## A new addiction for solitaire players

By RUTH O'NEILL

©1989 R. O'Neill

Chainlink is a delightful new program from Genial Computerware. It was written by Walt Howe and Wayne Stith, with documentation by Walt Howe. It is a simulation game, based on the card game Chainlink.

Chainlink is a form of solitaire in which all 52 cards are laid out face up, so there is no element of chance beyond the initial deal. The cards are arranged in 13 columns of 4 cards, and the object of the game, as with most games of solitaire, is to move each suit of cards up to the top of the table in order, starting with the aces. To do this, a player builds "chains" of cards of the same suit in the various columns of cards. It isn't at all hard to play, but there is a fair amount of skill involved in playing it well.

Obviously, it would be possible to play such a game of solitaire with an ordinary deck of cards, but it is much more fun to use this program. Dealing the cards out is painless — they deal themselves out before your eyes very quickly. If you're impatient to begin the game, you can turn off the visible deal and just have the cards appear before instantly, ready for play. Personally, I like to watch the cards slide into position, and it takes only a few seconds.

The mechanics of play are surprisingly simple: The columns of cards are labelled with the letters a-m, and moving a card from one column to the other is merely a matter of pressing first one letter, then the other. The card to be moved slides smoothly and quickly into its new position. If you change your mind before you make another move, the oops key (Fctn-1) puts the card back for you. If you have a lot of cards to move, you don't even have to go to all the trouble of pressing two keys — pressing "R" will repeat your move as many times as you like (or until it is no longer possible, of course).

Overall, it is a carefully planned, effective, and user-friendly interface. The only thing you can't do that you can in a real game is cheat. But, since everybody knows that only the most despicable of card players cheats at solitaire, there's no problem there.

The excellent graphics and pleasant sounds that provide feedback for the player add to the game's enjoyment. It may not be a great game strategy, but I tend to prepare as many cards in order as I can before I press the Enter key and move them to the top of the screen. All those enthusiastic bleeps and bloops

---

## Review

---

**Report Card**

<b>Performance</b> .....	A
<b>Ease of Use</b> .....	A-
<b>Documentation</b> .....	A
<b>Value</b> .....	A+
<b>Final Grade</b> .....	A

**Cost:** \$12+\$1 S&H**Manufacturer:** Genial Computerware, P.O. Box 183, Grafton, MA 01519**Requirements:** Disk system, expansion memory and Extended BASIC, TI-Writer or Editor/Assembler cartridge

and flying cards are immensely satisfying after a lot of careful thought and hard work.

There are other elements to the software package besides just playing the game, though. It is possible to give up on the current game and ask for a redeal at any point. Chainlink will also keep track of your wins during the session for you, so you can see your progress in mastering the game. You can even save your game, although only in the form of the original deal, not your current position. This has other advantages, though: If you make a crucial error and realize it at some point later in the game, you can start over with a game you know is possi-

ble to solve. This also helps if you want to practice a particular game to demonstrate to a friend and show off your skill.

The package comes with a large number of saved deals that are guaranteed possible to solve. The only problem I encountered there was minor — the default to load in these games was "DEAL1," while the first game was actually on the disk as "DEAL01." Not too hard to figure out, but irritating, just the same.

**DOCUMENTATION:** The documentation that comes with Chainlink is excellent. It isn't long, but it doesn't need to be. The instructions are straightforward and clearly presented, and I especially appreciated the tips on game strategy. On the other hand, if you are the type to religiously avoid reading manuals, you still don't have to worry. A summary of the rules is available on screen when you start the game, if you need it.

All in all, I was impressed with Chainlink. I've spent many hours playing it (it is addictive) and look forward to many more. The only real problem I've had so far is that it attracts back seat drivers just like the real thing. Oh, well. I've had more than my money's worth from it.

Look for Chainlink from your local dealer, or you can order it directly from Genial Computerware. Canadian customers should always use money orders for U.S. dollars, since there are often large service charges for cashing cheques drawn on Canadian banks.

---

## READER TO READER

---

Donald N. Andrews writes:

When I first got my TI99/4A one of the first modules I bought was Personal Record Keeping. When I finally got a PE box with a disk drive, PRK became the backbone of my computer. I later learned how to do a lot of the files using Multiplan, but had become accustomed to PRK; I was frustrated, however, by not being able to print records in condensed print using PIO.VARIABLE 132 as the device name for my printer to allow more columns per page.

When the GRAM Crackers came out, I thought I would be able to make this patch in the program and was happy to find the instructions to change the Tax Investment module from RS232 to PIO for the printer option. I felt the patch I needed had to be similar, but I lacked the knowledge to find the input option in order to do any changes.

When Jan Alexandersson provided his disk on the basic program PRK, I waited patiently for my disk to arrive from Sweden. While I did learn a lot about the PRK module from this utility, I was still unable to make the needed patch.

I've been told to use one of the other programs, such as PR Base, to accomplish the same result, but I am now more determined to find if the PRK module can be modified.

Provide comments, suggestions or instructions to Andrews at 478 Catesby Lane, Williamsburg, VA 23185-4733 or (804) 229-4974.

*Reader to Reader* is a column to put TI99/4A and Geneve 9640 users in contact with other users. Anyone with a specific problem or question that may be answered by other readers is encouraged to submit an item. Be sure to address it to Reader to Reader, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

## Personal Auditor Home Accounting System

# As much detail as you'll ever need

JOHN KOLOEN

The Personal Auditor Home Accounting System operates like a business accounting system. It uses checking and income ledgers and reconciles both to a general ledger. In many ways, it is at least as complex as many business accounting systems — TI-Count, for example — but as an added bonus allows the user to create and track a budget based on a chart of accounts.

This is not simply a checkbook manager. Although it assumes that most disbursements will be handled through a checking account, that is just the beginning. It also keeps track of income from whatever source, as well as federal, state and local taxes. If you follow the recommendations of author Bill Gaskill, you will even find yourself breaking out your deductible interest payments from principal payments, all this for the sake of accurate record keeping.

Of course, the user determines how extensively he wants to track his revenue and expenditures. It may be that all you want to do is track major expenses — groceries, rent, etc. — and this program will allow you to do just that. But with up to 60 categories in the chart of accounts, the detail-minded budgeters can really home in on specifics.

The program comes on a “flippy” disk, with a floppy-based system on one side, and a hard disk-based system on the other. Both require Extended BASIC and a memory expansion. A printer is highly recommended. I tried it with Epson compatible printers and found no problem. Using a Prowriter I was unable to control the printer, despite my attempts with the printer configuration module. The chart of accounts, for example, always printed out in an elongated character set, regardless of the control characters I entered. With the Prowriter, I wound up printing the chart of accounts to disk and then dumping it to a printer using TI-Writer.

**PERFORMANCE:** The program consists of about two-dozen modules that load separately from disk. A data disk is required for the floppy version. (A RAMdisk may be used in place of a floppy.) A directory must be created in the hard disk

## Review

### Report Card

Performance .....	A
Ease of Use .....	C
Documentation .....	C
Value .....	A
Final Grade .....	B+

Cost: \$20

Manufacturer: Bill Gaskill, 2321 Wintergreen Dr., Grand Junction, CO 81506.

Requirements: Disk system, expansion memory, Extended BASIC, printer recommended, hard disk optional

version.

The main system menu consists of 17 options, ranging from accessing the main input program to outputting a net worth statement. An unusual feature is a calendar editor that allows the user to enter “reminders” that will appear when the program is loaded on the specific date. When loading the program, the user must input a date before he can access the main system menu).

Setting up the program includes defining printer names, as well as pathnames for hard disk use, and, of course, organizing the chart of accounts. The chart of accounts consists of user-defined ledger categories

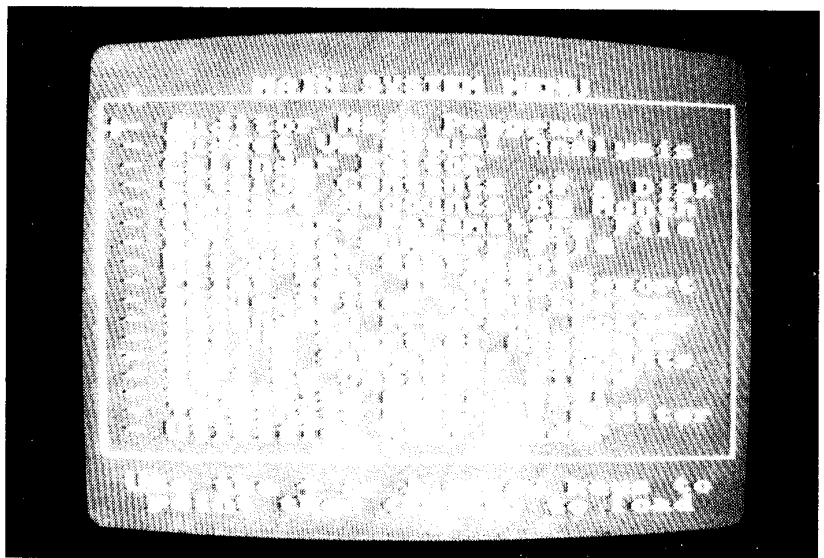
that are flagged by types. These include income, non-deductible expenses, deductible expenses, and transfers of funds from one type of ledger to another. The chart of accounts can also make use of credit cards. Fortunately, for the non-accountants among us, the program comes with a predefined chart of accounts that can be used as is or as a template for customizing.

In addition to defining the chart of accounts, the user also inputs budgetary amounts for each category. The chart of accounts may be changed at any time, though once you start using the system to input expenses and income it's probably not a good idea to deviate too far from what you started with.

Like most commercial accounting systems, Personal Auditor creates files for each month for income and checks written. These are then merged into a general ledger file. By sorting and summarizing the general ledger files the user can create a number of reports, including budget vs actual expenses and income, month to month comparisons and year to date analysis. The data from the ledger is also used to update the net worth file each year.

This program is so extensive in its scope that it's pointless to try to describe in detail how it works. Let it suffice that each expense is recorded by check number, date,

(See Page 40)



## PERSONAL AUDITOR—

(Continued from Page 39)

payee, the chart of accounts category number and a brief description of the transaction. Income is entered in a similar fashion. This is standard operating procedure for an accounting program, and there is no deviation here. In fact, Personal Auditor mirrors in its operations the commercial programs I've used to do business accounting.

Users who crave lots of detail will be satisfied with this program. The audit trail it creates is extensive and the details of transactions can be output to a printer.

**EASE OF USE:** This program is not easy to use. It badly needs a tutorial. Part of the reason for the difficulty is in the nature of the documentation, but more on that later. If you don't understand the principles of accounting, this program can throw you for a loop. You will definitely need to read the extensive manual, perhaps twice.

**DOCUMENTATION:** I have seen few manuals that go into greater detail than the

thick, 8½x11 manual that comes with Personal Auditor. I have no doubt that it contains enough information to constitute a short-course in accounting. Unfortunately, it is arranged in a manner that makes it difficult and frustrating to use. Rather than being designed in a tutorial or logical fashion, the manual is divided into chapters alphabetically by subject.

For example, if you want to learn how to enter data, you have to turn to the chapter called AddRecords. If you want to learn about the main menu, you have to turn to the chapter called MainMenu, which is in the middle of the manual. In other words, to really use the manual, you first have to know what the terms are and what all the chapter names mean in order to know what chapter to turn to. And it's not all straightforward. As an illustration, the chapter called EditSumFile is about editing summary files but you first have to know what a summary file is before you can use it.

I've spent hours wishing there was a

tutorial for this program while trying to learn to use it. It may well be that this program is much easier to use but that the way the manual is organized it just seems a lot harder.

Still, the effort that went into creating and producing the manual deserves respect.

**VALUE:** At \$20 this program is one of the great bargains in the TI marketplace. There is no question in my mind that the author spared neither time nor expense in this effort, and it shows. Although one does not have to take advantage of all the capabilities that this program has to offer, it is designed for those who really want to come to grips with their personal spending habits. These users will give it the time it takes to learn how to thoroughly use this program. And once they have learned it, I have little doubt that they will feel the effort was worth it. For those who aren't so committed to the bottom line, this program would represent a considerable challenge.

## MICRO-Reviews

# The music is incredible

By HARRY BRASHEAR

Ratings for the software reviewed in this column are based on a star system as follows:

- ★ Leave it alone, back to the drawing board.
- ★★ Needs improvement, but workable.
- ★★★ A good program, worth trying.
- ★★★★ Send your money and buy it.

Well, surprise, surprise! Tiers don't take vacations I guess because the software is still flowing in steadily. This month I'm handing out awards in the Arts and Music categories first. Read on.

★★★★

### HARRISON SOFTWARE MUSIC DISKS

We Tiers have been blessed with a pretty good chip for music, and once in a while, someone comes along that can get the most out of it. Of course, I'm not a musician, but I do like various kinds of music, and I know *good* when I hear it.

Let me quote you from the introductory letter that I got with the Harrison Software music, it tells it all; "...our music and 'instruments' are not for novelty, rather, to create as closely as possible the original settings intended by the composer."

These music disks have a certain "correctness" about them, in tone and timing, that beats out most everything else that I've heard. For example; I think I have at least two or three versions of *Variations* in my music library. They sound pretty good for synthetic music, but did you know that there are 30 variations to that aria, intended for harpsichord, and that it should last for about 40 minutes. The Harrison version lasts that long, includes them all, and sounds fantastic.

Next, I listened to the *Nutcracker Suite*, not just the overture mind you, but the whole, cotton pick'n show. That was another hour down the tubes. (How do they fit so much music on one disk?) I quote again, concerning this disk... "The *Nutcracker Suite* being an orchestra score, the inten-

tion here was to put it a chamber setting as tastefully as possible." I could hardly believe it was coming out of MY computer.

Finally, I got to the Potpourri disk subtitled, "Music Of the Baroque, Galante and Classical." This disk contained 28 pieces of music, all of which were stupendous. Never once did I detect a slipshod bit of programming or a sour note in any piece I listened to.

The people that put these disks together, Dolores Werths and Bruce Harrison, are professionals, one each for programming and music. Also, so that you will better appreciate what you are listening to, there is a file on each disk giving the history of the music stored there-on.

I'll tell you what folks, these people get more than four stars, and my guarantee that you get your money's worth, they get my respect.

Tell them your disk format and send \$4.50 each plus 50 cents postage, for *Nutcracker Suite* (See Page 42)



## Ahoy Maties!

Yo ho ho and a Bottle of Rum! The Captain wants it known, mates, that Disk of Dinosaurs was just a taste of Mr. Gilliland's fertile imagination. He has now made available a package that gives you a little bit of an idea of the life and times of the pyrates of old. Disk of Pyrates is indeed a masterpiece - it is four disks full of pyrate artwork, pyrate fonts, pyrate history, pyrate games, pyrate animation and even a pyrate sing-along! If you always wanted to know more of the exploits of Black Bart, Blackbeard, and the others that sailed the Spanish Main for booty and blood, then this disk is for you. It can't rightly be called just a graphics package because you will learn much about the buccaneers that terrorized the Spanish and laid waste to Merchantman and Naval ship alike. It can't be called a history lesson because the beautiful hand-drawn graphics will find use in your own pyratival works, as well as in calendars and reports. Finally, it can't be called a game even though it is more fun then the law should allow. Even a scurvy dog will realize that it is like nothing else for the TI-99/4A! Disk of Pyrates requires a TI-99/4A with 32K, a disk system and Extended BASIC. TI-Artist is recommended but not required. A TI or Corcomp disk controller is required to view the pyrate animation. At \$14.95, the great value of this package will warm the heart of even the hardest salt.

**Asgard Software**  
**Box 10306, Rockville, MD 20850**



## Disk Of Pyrates

# Music Pro

### Features:

- A full-featured music editor that lets you enter notes anywhere, insert, delete, and much more!
- Editor block functions let you move, copy, delete, transform any range of notes.
- Enter up to three voices from sheet music and compile into assembly language - no need to make all notes the same duration between voices! Great for musicians!
- Print out sheet music on Epson or compatible printer.
- Transpose octaves.
- Easily save/load music
- Compiled music can be run independent of program in Extended BASIC!

*Music Pro* is an amazing MUSIC PROCessor for the TI-99/4A that makes creating music on the 99/4A as simple as typing in sheet music! By David Caron and Lucie Dorais of the Ottawa TI-99/4A Users Group, *Music Pro* allows you to type music directly on a staff - one voice at a time. While editing you can delete, insert, move, copy and even transform and transpose single or whole blocks of notes at a time. Enter up to 400 notes for a single voice. Later, after entering all the voices you can compile them into an assembly language file. *Music Pro* automatically takes care of time differences between the voices - you just concentrate on entering the music and *Music Pro* takes care of the rest! Compiled music can be run from the program or used by itself for games or music programs. Even print out sheet music on an Epson or compatible printer! Requires 32K, Extended BASIC, Disk. *For the TI-99/4A only.*

Suggested Retail:  
**\$17.95**  
 U.S./Canada - Please  
 add \$1.00 S&H  
 Other - Please add  
 \$4.00 Airmail

**Asgard Software**  
**P.O. Box 10306**  
**Rockville, MD 20850**  
**(703)255-3085**

## MICRO-REVIEWS

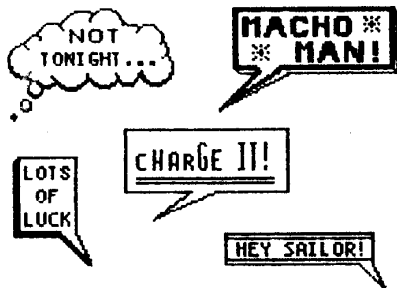
(Continued from Page 40)

cracker, Variations, or Potpourri, to: Harrison Software, 5705 40th Place, Hyattsville, Md. 20781.

### ★★★ CAPTIONS

My first impression of this offering was one of pure skepticism, then I looked again and thought, "gadzooks, what a lot of work, but to what end?" Finally, I took the whole thing apart, took a good look at it and decided that there really is a need for CAPTIONS.

If you do posters, newsletters, or any other graphic work, you have need from time to time for something like what I have pictured below.



Kinda cute aren't they? Mr. Andrews has supplied about 200 of these things on two disks, including a list of the wordings in TI-Writer format. If you have need of a phrase, you can look it up alphabetically and get the file name or number. (Usually a number, but the blanks that he has also supplied have alpha designations.)

They are designed for TI-Artist format and are all instances that you can load and place through the Enhancement module. There are 15 blank "balloons" that you can fill in yourself with a font that is also provided.

I looked at a large sampling of the captions and found all of them to be useful and have been well done. They are designed for the lazy among us, and I'm glad I have them in my graphics library. Good show, Steve!

Send \$10 to Stephen Andrews, 6 Ralph Place, North Bay, Ontario Canada P1A 1L2.

### ★★★ JAPANESE STUDIES

Talk about your limited usage programs... here's one to teach you the Japanese language, and how to write it.

Hey, what the heck, isn't that what you bought a computer for, to get help with unusual problems. Here's the story:

Don Shorock bought his TI a long time ago and wanted to learn Japanese. He started out programming lesson drills on it to help him study. The programs got better, and then he discovered the fairware network, so it seemed natural for him to help other people too. The result is a full disk of programs, including a beautiful set of docs, that will teach you to speak to the guys that bought your corporation.

The quizzes are multiple choice and they include the Japanese symbols to select from. There is also a program to print out a selection of 5,000 random sentences to practice on.

I'm a little afraid of under-selling this program so let me give you a rundown of what's on the disk. Keep in mind that this language comprises three forms of writing according to the docs.

1. Five hundred and fifty-eight verb forms in Hiragana, including pronouncer.
2. Two hundred words/phrases in Hiragana.
3. Eighty-eight symbols in Kanji, with pronunciation and meaning.
4. Seventy-seven food words from English in Katakana.
5. Study drill for adjectives.
6. Study drill for verbs.
7. A program to print study sheets for telling time.

...and a couple of other items of similar nature.

I think the concept is pretty neat and the programs work okay. It's just that I don't know how many of us will be beating down Don's door to get it. I think if a TI-Artist font of Japanese symbols were added to the program, it might be more useful to more people. Nevertheless, it's Don's first crack at our community and I think he has done a bang up job on the programs. Most of them will run in BASIC so elementary school teachers might want to look at this

for a little classroom diversion.

Send a couple of dollars, a blank disk and an SASE to: Don Shorock, PO Box 501, Great Bend KS, 67530.

### SOME NOTES TO FINISH UP WITH

Shirley Slicer, 1101 Purdom St., Olathe KS, 66061 is offering the TI Comparison Shopper for \$5. This is a compilation of most of the software now available for the TI, where to find it and the approximate cost. These TI-Writer files consist of 260 sectors, and are alphabetized. There are also sections for hardware, books and miscellaneous stuff like disk boxes. It's a noble effort and no group should be without a copy in their library for the newcomers. They must get permission from Shirley for distribution, however.

I received a copy of two programs recently from Sweden that may spark curiosity among the more adventurous. They are called "Personal Recordkeeping Basic" and "Statistics Basic." If I am interpreting this program correctly, it will allow you to do some pretty fantastic stuff with either of the aforementioned cartridges in the port. The problem is that I have long since given away both of these cartridges so I can't work with them. If a couple smart cookies want to drop me a line, showing me that your qualified, I will send you these disks, but you **MUST** be ready to go over them carefully and let me know the results of your findings within 30 days.

Finally, will you folks **PLEASE** send your phone numbers along with your products. I need to call sometimes with questions and it saves the cost of out-of-state information service.

**If you would like me to review your software in this column, please send it to the address below, and if you would like it returned, include a SASE. Write to: Harry T. Brashear, 2753 Main St., Newfane, NY 14108.**

### MAGAZINE HOLDERS

Keep your MICROpendium collection neat and orderly with plastic holders from MICROpendium. The holders are \$3 for 12, plus \$1 shipping per order. The holders are used with three-hole binders. Use the form on Page 48 to order. Allow 2-4 weeks for delivery.

# Newsbytes

## Developer package available for Geneve

GENPROG, a program development package for the Geneve 9640 written by Paul Charlton, is available in limited release from Disk Only Software.

GENPROG contains programs that run in the MDOS mode. GENREF documentation — which completes the release — cannot be finished until a stable MDOS is available, according to the manufacturer.

The limited-release package (Package 1) contains GENASM, GENLINK, GENLIB, LIBRARIES and GENMAKE. GENREF will be shipped on completion. The package also may be ordered as Package 2, to be held and shipped on completion of GENREF.

Package 1 sells for \$74.95 cash or check, \$79.95 credit cards, shipping \$5. Package 2 sells for \$69.95 cash or check, \$74.95 credit cards, shipping \$5.

GENASM is a macro assembler, GENLINK is a linker, GENLIB is a program for maintaining code libraries for the linker, LIBRARIES contains commonly used routines for 99/4A and MDOS programmers, GENMAKE is designed to allow an author to keep track of file dependencies in programs and large documents and GENREF is the MDOS programming environment documentation.

For further information or to order, write Disk Only Software, P.O. Box 244, Lorton VA 22079 or contact DOS on Delphi or 74405,1207 on CompuServe. Order line number is 1-800-736-4951.

## New ColumnText version released

Version 4.2 of ColumnText is now available, according to the author, Ron Prewitt.

Version 3.2 was reviewed in the MICROreviews column in the June 1989 MICROpendium.

Enhancements in the new version include two-column condensed printing, pagination and hard-drive access.

Prewitt says registered users can obtain the new version by sending him \$1.50 for disk and postage. Others who would like

to order the program are asked to send \$5 for the program plus \$1.50 for the disk and postage.

Write Prewitt at 6429 South Fife, Tacoma, WA 98409.

## Central Illinois show set for Sept. 9

The Central Illinois Computerfest, an annual nonprofit event supporting all brands of personal and business computers, is scheduled for Sept. 9 in the Decatur Civic Center, Decatur, Illinois.

Vendor spaces rent for \$50. Tables will be provided.

For further information, contact Helen Logan, (217) 429-1809 or Jim Haws, (217) 963-2607.

## Designer Labels upgrade released

Designer Labels v.2.4 has been released by Texaments.

This is an upgrade of a utility that allows TI-Artist instances to be printed repetitively on mailing labels and various card stock.

The new version has the ability to print instances in both single and double-size formats, track multiple prints and abort at any time during the process, according to the manufacturer. The “\_I” extension is now automatically assumed by Designer Labels when loading instances. Also, the manufacturer says program and loading time and double-density printing time have been reduced.

Owners of earlier Designer Labels releases may upgrade to v.2.4 by returning their original disk along with a check or money order for \$3. Anyone who purchased Designer Labels after July 1, 1989, may upgrade to v.2.4 for \$1.25 if a dated sales receipt accompanies the request. Upgrade fees include the newly revised program, a manual addendum and shipping charges. All upgrades are being handled directly through Texaments.

When upgrading, users may purchase the Designer Labels Companion products, also from Texaments, at a special reduced rate not available without the upgrade. Designer Labels Companion #1 is available for \$8.95 and Designer Labels Com-

panion #2 is available for \$6.95, and both together are available for \$14.90. A \$2.50 shipping charge must be added if Companion products are ordered.

To upgrade or for information, contact Texaments, 53 Center St., Patchogue, NY 11772 or (516) 475-3480 (voice) or (516) 475-6463.

## Longview user group to have fair booth

The Longview Computer Users Group will participate in the Gregg County Fair in Longview, Texas, Sept. 12-17.

The user group, which has special interest groups for various computers, is an outgrowth of the Longview TI99 Users Group. The group has more than 300 members and operates a bulletin board and newsletter.

More than 100,000 persons are expected to attend the Gregg County Fair, according to Leo W. DuBry of the Longview group.

For further information, write DuBry at DuBry's Photography, 325 S. Center St., Longview, TX 75651.

## Board in production

Eric Zeno says the “Internal Board,” also known as the “Zenoboard,” is now being manufactured in quantities of 100.

According to Zeno, the board allows the user to add 32K memory, a clock circuit, Extended BASIC and the Speech Synthesizer to the interior of the TI console.

The boards are \$17.50 each. Documentation, approximately eight pages of schematics, builders' notes, parts list, software for the clock and parts placement overlay, is available for \$1 per copy.

Shipping is \$2.50 for the first board in the U.S. and 50 cents for each additional board. In other countries, shipping is \$8 for the first board and \$6.75 for each additional board. All prices are U.S. currency.

Zeno says the board includes three additional, switched GROM sockets. Any circuit configuration can be used. The board requires no additional power and is compatible with all other known hardware and software, he says. He says the board eliminates nearly all lockups caused by the

(See Page 44)

# Newsbytes

(Continued from Page 43)

Extended BASIC cartridge. In addition to soldering component connectors, only 12 additional wire connections have to be made to build a complete board, Zeno says.

Switches may be added to turn off any or all circuitry and there is a GROM reset switch, he says. Small modifications must be made to the plastic on the inside of the console and hand soldering skills are recommended.

Overseas shipping may require additional invoicing, he notes.

For information, or to order, contact Zeno at 414 Highland RD., Pittsburgh, PA 15235 or (412) 371-4779.

## Memory expansion created for Geneve

Bud Mills Services is offering a new memory expansion for the Myarc Geneve 9640. The memory expansion has been designed and developed by Ron Walters of Dynamic Systems Research Inc. and will be produced by Horizon Computer.

The memory expansion "MEMEX" uses the more economical 1 meg dynamic memory chips. The MEMEX uses a new refresh circuit design and automatic detection of other cards that may cause bus conflicts, according to the manufacturer. The card will support "zero wait state" operation and is fully socketed for expansion up to 1.5 meg (greater than 504K requires a minor modification on the Geneve).

The fully constructed tested and warranted 504K MEMEX is priced at \$245. No kits are available because of a timing adjustment that is required.

For information or to order, write Bud Mills Services, 166 Dartmouth Dr., Toledo, OH 43614.

## EXEC loads E/A files from MDOS

Barry Boone is offering a Fairware program that allows Geneve users to load most assembly language programs from MDOS, without having to load the GPL interpreter. Called EXEC, the program allows programs such as Telco, Archiver and others that load from Option 5 of the

Editor/Assembler directly from the MDOS prompt without using TI-MODE.

Boone has also upgraded his Archiver program to Version 3.03G. This version includes a previous patch that fixes a timing problem when running Archiver out of the Geneve. (The fix was published in the July issue of MICROpendium.) Another modification allows the program to be used with the Myarc Hard & Floppy Disk Controller when the HFDC is used to control both hard and floppy drives. This is a configuration that is used by few users, however.

EXEC may be downloaded from bulletin boards, or send Boone a floppy disk, and postage-paid return mailer. His address is Box 1233, Sand Springs, OK 74063.

## Asgard introduces three new programs

Asgard Software is offering three new products. They are Legends II, MDOS Conversion Notes and HardMaster.

Legends II is a continuation of the Legends series. The scenario starts with a shipwreck that leaves the player stranded on an island. The object is to explore the island in order to raise funds for passage home. The 3-disk adventure has new graphics, spells and monsters. Written by Donn Granros, the program requires Extended BASIC, memory expansion and a disk system. Suggested retail is \$17.95.

MDOS Conversion Notes is a package to aid assembly language programmers port software from the TI99/4A to the Geneve. Consisting of a book and software, it includes utilities for MDOS that are analogs to 99/4A assembly programs. According to Asgard, "with the aid of the documentation they can easily be linked to your own 99/4A programs." Fully commented source code is included and may be used without a license. An MDOS linker is included. It requires a disk system and Editor/Assembler or equivalent software. A Geneve is recommended. Suggested retail is \$12.95.

HardMaster is a hard disk sector editor for use with the Myarc Hard & Floppy Disk Controller. It features an editor that lets users edit up to four sectors at a time; sectors may be dumped in both ASCII and

hex to a printer; a Tree function that lists all directories and their files with sector information on each; and the ability to dump the bitmap or sector allocation table to a printer. Other standard sector editor functions are also supported. The program can be used to repair corrupted files or recover lost directories on hard disks.

The program is compatible with the 4A and the Geneve. TI users must have expansion memory. It runs out of Editor/Assembler on both machines. The program was written by Colin Christensen. Suggested retail is \$14.95.

To order, or for more information, contact Asgard Software, P.O. Box 10306, Rockville, MD 20850, (703)255-3085. Mastercard and Visa are accepted.

*Newsbytes is a column of general information for TI and Geneve users. Information from manufacturers is welcome. Illustrations and photographs will be used when space permits. Send items to MICROpendium Newsbytes, P.O. Box 1343, Round Rock, TX 78680.*

## USER SUPPORTED SOFTWARE

*User Supported Software is noncommercial software written and distributed by readers. Anyone wishing to submit an announcement is encouraged to send a copy of the program or product as well as a description to MICROpendium. MICROpendium cannot take responsibility for items that appear in this column.*

### PICASSO COMPANION 2

Several pictures, fonts and borders for use with Picasso Publisher. Includes docs and a Picasso reference guide. \$10 donation. Send SS/SD floppy.

### HOME FILER 2.1

Data manager for the home. General and "phone book" database, text file viewer and memo writer, with docs. \$10 donation. Send SS/SD floppy.

### DV MANAGER 80

A system that provides simple manipulation of text files. Copy, view, print files. Compare or catalog disks. \$5 donation. Send SS/SD floppy.

### PHANTAM OF THE OPERA

A musical mix of songs from the Broadway show. Includes a tutorial on programming music. \$5 donation. Send SS/SD.

The above programs require memory expansion and Extended BASIC. Send 1 disk as noted for each program plus 60 cents per disk for postage. Donations are requested by not required. Send to Andy Frueh, 638 Maplewood Dr., Lima, OH 45805, (419)222-6819.

# User Notes

## VALUE-able function

We thought everybody knew this, but since it appeared in Newsletter Nine-T-Nine of the Toronto Users Group we'll reprint it here. The author is Jim McLaren, and the item originally appeared in the Sudbury 99ers newsletter. He wrote:

When I was inputting data into Multiplan I had several entries for one category. I used the calculator to add them all up before I entered the data. Then I thought — *why not let Multiplan do the work for me*. I selected (V)alue and then entered the following numbers into a cell: 5.67+4.32+9.09. Press enter. Multiplan gave me the total, plus when the cell is highlighted again the formula remains intact.

At our monthly meeting I mentioned that you could add figures up into one cell. No one in the group was aware of that. So, we tried all the math functions. And they worked."

Using (V)alue when inputting numbers is handy when budgeting or keeping track of expenses. Say you have a category called Groceries that you track each month. By using (V)alue, you can enter each expenditure as it occurs. The result will be a running total which, when edited, will reveal each expenditure. By simple editing, you can even get an average per expenditure, as well as a count of the number of expenditures. All of this from that single cell.

## Why reformat a hard disk?

Is there a need to reformat a hard disk?

The answer is yes, and the frequency of reformatting depends on the quality of the hard disk as well as the environment it is in.

Inexpensive hard disks, such as the Seagate 225, 238 and 251, and others that lack shock mounting, are the touchiest. When mounting them in enclosures make sure they are mounted firmly, but don't tighten the mounting screws too tight (this can cause stress on the head disk assembly).

The biggest problem with inexpensive drives is in the stepper motor (voice coil drives don't have these problems).

Variables ranging from ambient temperature, to power fluctuations to case flexing can eventually result in a failure of the stepper motor hard disk.

This isn't a "hard" failure or crash. Rather, the symptoms of the problem are read/write errors. Your hard disk will be slow in reading or writing, or you'll see error messages notifying you that you can't write to or read from the hard disk. Usually this will be transient, so that when you try to read or write a second time, or power-down and then power-up, everything will seem to be normal. At this point, however, you definitely want to be thinking about backing up your hard disk and reformatting it. If you ignore these symptoms too long, you might find yourself losing Sector 0 and have no choice but to reformat.

You should know that the problem isn't in the software you use but in mistracking. In other words, the hard disk gradually loses its ability to write data precisely where the track and sector identification marks are located, which are laid down when formatting the drive. The data instead gets written across these reference points.

There really is no way to avoid this type of problem. (Better drives that also use stepper motors minimize these problems by isolating the head disk assembly with rubber shock mountings, but even these will require formatting every 1-2 years.) There isn't a hard disk made that at some point won't experience these problems. It is just a matter of time before they show up.

As a rule of thumb, with inexpensive drives, you may need to reformat every 12 months if you don't experience read/write problems — more frequently if you do. And if you move around a lot or environmental conditions are not ideal — fluctuating temperatures, smoke, etc. — you may want to reformat every six months just to be on the safe side.

An advantage to reformatting is that read/write operations will be faster. That's because data and programs are fragmented when first written to the hard disk. After reformatting, the files are rewritten to the hard disk contiguously so that fragmentation doesn't appear until additional files are written to the disk.

## CHARAIFIX correction

This comes from Wayne Stith, author of the CHARAIFIX program published in the June-August editions. He writes:

One correction to my CHARAIFIX article: The 6-byte header found at the beginning of PROGRAM files indicates among other things where the file should be placed in CPU RAM, not VDP RAM; thus this information is of little use for CHARAI files which are meant to stay in VDP. Where a file is placed during the load process is dependent on the information in the Peripheral Access Block (PAB).

## SEB & EA & GK

This item, by Barry Ensley, appeared in Topics, the newsletter of the LA 99ers.

Own a GRAM Kracker and Super Extended BASIC?

Or, are you presently using GK Extended BASIC with the Editor/Assembler attached using the XBEA Patch program from Danny Michael's BK Utility I disk?

Would you like to use the same setup, but replace GK-XB with SEB? I couldn't find a means of accomplishing this task.

After some exploring, I discovered that all the E/A material appeared to reside in the third file of the saved GK-XB and E/A module. As an example, let's assume I had saved the GK-XB and E/A module as GKXB&EA. The file called GKXB&EA2 is the one in question.

With this little information in hand, I decided to try something. I had SEB saved, unlikely as it seems, with the filename SEB. I renamed the file GKXB&EA2 as SEB2 and proceeded to load my new SEB module.

To my surprise and delight, there appeared on the menu screen both Super X-BASIC and Editor/Assembler. And not only were both there, they both seemed to work perfectly.

That was a number of months ago, and my new SEB&EA module is still working without fault. I don't guarantee there aren't problems just waiting to crop up. However, my limited knowledge of this area, logic and experience seem to bear out that this simple technique has allowed the combo of

(See Page 46)

# User Notes

(Continued from Page 45)

SEB and E/A and GK to exist.

To review:

1. Save Super Extended Basic with the GRAM Kracker.

2. Take your GRAM Kracker Extended BASIC and Editor/Assembler saved module (a backup copy, of course), as accomplished with the GK Utility I XBEA program, and rename the third file (ending with 2) to match the name of the third file of the SEB saved module.

3. Load and then resave the resulting module under a new name.

That's all there is to it. (Note: The GK-XB you use can be enhanced beyond what the Utility I package did. Also, I do not have the actual Editor and Assembler programs residing in GRAMs 1 and 2, and part of the module space. I haven't investigated this, but I feel certain that this feature can't be retained.)

## Things to do when your console locks up

John Guion, developer of Multi-Mod, wrote the following item as part of a column on curing console problems. The column appeared in the newsletter of the Dallas TI user group. The portion published here is submitted "Intermittent Console Lock-up."

Occasionally, a console will suffer from lock-up during regular use of software. This may be caused either by a software error, a hardware error, or a disturbance of the system. Assuming that software errors and outside disturbances (such as bumping the flex-cable connector) have been eliminated as possible causes, several conditions may cause random locking up of the console during use.

Cures for random console lock-up fall into three main categories: Power supply, heat, and poor connections.

### Possible Causes and Solutions

► Check the computer's supply line voltage. The transformer input should be approximately 117 VAC. The output of the console's internal supply should be +5V, +12V, and -5V. Approximately 5 percent variation for each of these is tolerable.

► Test the computer in different surroundings. If the computer consistently

works at another location or with different equipment attached, it may be affected by some components connected to it or by electrical interference from the 117 VAC supply.

► If lock-up occurs only after some period of use, the problem may be heat related. Make sure the console's ventilation slots are not blocked. Check the heatsink of the TMS9918A chip for sufficient heat-conducting grease as well as the TIM9904 if it has a heatsink attached. A cooler switching power supply may be installed to help further lower operating temperature.

► If the console fails to run certain modules reliably (such as Extended BASIC) and such modules often need reseating several times, the GROM port should be changed. This typically occurs with modules that use contacts on both sides of the edge connector in the module, as is the case with Extended BASIC. Cleaning the GROM port may also help, but the problem will probably appear again shortly unless a new port is installed. (For parts information and prices, call Texas Instruments at 806-741-2265.—Ed)

When replacing or cleaning the port, be sure to remove the felt or foam wiper from the clip-on cover to the port. The wiper may be removed with a small screwdriver and solvent. Replace the plastic cover once the wiper material has been removed. *Do not* use any type of lubricant, since this will attract dirt and cause further problems.

► A poor connection at the console's I/O port on the side may also lead to occasional problems. If problems persist after checking for a secure connection, remove any device connected to the side port and use alcohol and a stiff piece of paper to clean the inner contacts on the device.

Remove the main board from the console and clean the edge connector with a pencil eraser, followed by wiping with an alcohol-treated pad. Only light rubbing is needed with the eraser to remove surface oxidation and produce a clean surface. Excessive rubbing will not help and may remove too much plating from the board, especially if this procedure is repeated several times.

► Check the power plug at the back of the console for tightness. A loose connection may cause occasional power failure.

tion may cause occasional power failure. If this plug is loose, use pliers or another suitable device to bend the pins in the receptacle *slightly* towards each other. A small piece of electrician's tape around the plug will also help secure the connection.

## Disable switch for Horizon RAMdisk

This item was produced by Bud Mills Services, which markets the Horizon RAMdisk.

This modification provides a method to turn off (or hide) the HRD from the rest of the system. This switch allows you to turn off the RAMdisk in the event of a system crash when the computer locks up. With the card turned off, you can power-up the console and PEB, turn the card back on and proceed to re-load the operating system. No need to remove the batteries to erase the contents and, in most cases, the files may be recoverable. Other reasons for "hiding" the card could be a conflict between the RAMdisk and a program you want to run. Or, you may wish to keep the kids out of it.

• Remove the voltage from pin 6 of U20 (serial 1999 and below) or U20A (HRD+, 2000 and up) and reconnect it via a resistor (1K-10K will do) through a SPST switch to ground (see illustration on Page 47).

(See Page 47)

**SUPER EXTENDED BASIC OWNERS!**  
Have four modules in one with:

### **MULTI-MOD**

The MULTI-MOD is a plug-in upgrade for owners of Triton's Super Extended BASIC module that gives you SEB, Editor/Assembler, Disk Manager III, and TI-Writer ALL IN THE SAME MODULE! It may be the only module you'll ever need!

The price of the upgrade kit is \$22.95 and includes a manual and disk with the Editor/Assembler and TI-Writer support files. A free brochure is available on request from:

John P. Guion  
P.O. Box 4628  
Lubbock, Texas 79409

Also ask about TI RS232 and Disk Controller upgrade kits.

(Super Extended BASIC is a trademark of Triton Products Company)

# Classified

## SOFTWARE

### FOR SALE

120 original programs \$1 each, 18 full collection disks \$5 each, 5 Tips disks reduced to \$5 each, 3 Nuts & Bolts disks reduced to \$10 each. Send \$1 refundable for Tigercub catalog. 250 disks of public domain and fairware, \$1.50 each. Send SASE for list or \$1 refundable) for catalog, to TI-PD, 156 Collingwood Ave., Whitehall OH 43213. v6n12

### ROLL CREDITS

Introducing a new version of ROLL CREDITS. Now with a save feature, a special price and a free program with your order. Video "movie makers," give that special touch to your productions. Create professional titles with the Roll Credits title generator. Only \$12.95 for new version on diskette. Send SASE for details or check with your order to: Newcastle Enterprises, 13424 North 33rd Place, Phoenix AZ. 85032. v6n9

## Policy

The cost of classified advertising is 25 cents per word. Classified display (i.e., special formatting or graphics) is \$9 per column inch. Classified advertisements must be paid in advance. Classified advertisers may request a category under which they would like their advertisements to appear, but the final placement decision is the responsibility of the publisher.

Classified deadlines will be kept open for as long as practical. For the purpose of classified advertising deadlines, any classified ad received later than the first day of any month cannot be assured of placement in the next edition. We will do our best to include every advertisement that is submitted in the earliest possible edition.

The publisher offers no guarantee that any advertisement will be published in any particular issue. Any damages that result either from errors in copy or for failure to be included in any particular edition will be limited to the amount of the cost of the advertisement itself. The publisher reserves the right to reject any advertising.

The advertiser may elect to publish the advertisement in subsequent editions at the same charge, payable prior to publication. The deadline for carryover classifieds is the same as for new advertising.

In submitting an ad, please indicate whether you would like a refund if it is not published in the requested edition or whether you would like us to hold it for the next edition. Cancellations and refunds cannot be made after the second day of the month.

Send classified advertising to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

## HARDWARE

### RAM DISK

HRD 2000+ 768K sacrifice \$400. Greg Kimball, 230 Timber Ln, Boulder CO 80304 303-444-6514. v6n7

## HARDWARE

### FOR SALE

MAXIMEM (Canadian GRAM-Kracker) with GRAM-Packer \$75, 80 Column Card \$80, 128K GRAM-KARTE \$90, TI-Mouse \$50. S&H free. Norberto Bettinelli, Casilla de Correo 39, Buenos Aires, Argentina. v6n7

# User Notes

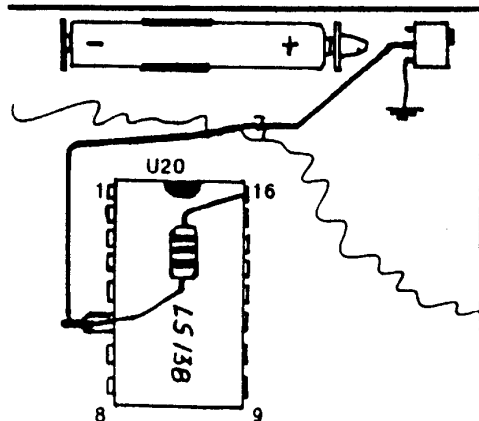
(Continued from Page 46)

Closing the switch pulls the pin low and shuts off the CRU access at U20.

- Bend out pin 6 of the chip, attach enough wire to reach the switch and connect the resistor from this pin to pin 16 of the same chip. Run the other end of the wire to the switch.

- Mount a miniature Single Pole Single Throw switch at the top back edge of the card. Run a lead from one pole to a nearby ground.

Note: The HRD+ circuit board on cards with a serial number below 1999 required stacking of U20. Attach the wire and resistor to the top chip's pin 6 and cut off the bottom end.



*User Notes* is a column of tips and ideas designed to help readers put their computers to better use. The information provided here comes from many sources, including TI user group newsletters. MICROpendium pays \$10

for any item sent in by readers that appears in this column. Mail *User Notes* to: MICROpendium User Notes, P.O. Box 1343, Round Rock, TX 78680. Or post them to us on CompuServe, Delphi or Genie.

## MISCELLANEOUS

GAMES! EDUCATIONAL! HARDWARE! —TI99/4A

CALL OR WRITE FOR FREE CATALOG:

JOY ELECTRONICS, INC.; P.O. BOX 542526;

DALLAS, TEXAS 75354-2526;

(214) 243-5371, LOCAL; (800) 442-3892, TEXAS;

(800) 527-7438, OUTSIDE TEXAS v6n8

PASCAL COMPLETE SYSTEM	\$150
BARCODE READER	\$ 30
FULL TI PE/BOX	\$350
EMPTY TI PE/BOX	\$135
18" P-BOX EXTENSION CABLE	\$ 25
SCM DOT MATRIX PRINTER	\$110
SPEECH SYNTHESIZER used	\$ 45
PARALLEL PRINTER CABLE 6'	\$ 20
PE-BOX TECH TRAINING MANUAL	\$ 30
TI ORIGINAL COLOR MONITOR	\$175
SERVICE MANUAL (CONSOLE/P BOX)	\$ 25
4A FACTORY REPAIR MANUAL	\$ 30
EXTENDED BASIC used w/new book	\$ 35
USED TI99/4A, HARDWARE, SOFTWARE BOOKS AND PARTS. Call or write for complete free list. 5% S&H	
JIM LESHNER, 722 HUNTLEY	
DALLAS, TEXAS 75214, 214 821 9274	v6.n7

# The LEADING monthly devoted to the TI99/4A

## Subscription Fees

\$20 for 12 issues via domestic second class mail  
 \$25.25 (U.S. funds) Mexican delivery  
 \$27.50 (U.S. funds) Canadian delivery  
 \$25.00 (U.S. funds) for 12 issues other foreign delivery via surface mail  
 \$37.00 (U.S. funds) for 12 issues other foreign delivery via air mail

Outside U.S., pay via postal or international money order or credit card; personal checks from non-U.S. banks will be returned

## Address Changes

Subscribers who move may have the delivery of their most recent issue(s) delayed unless MICROpendium is notified six weeks in advance of address changes. Please include your old address as it appears on your mailing label when making an address change.

## Back Issue Policy

Back issues of MICROpendium are available to subscribers only. Those wishing back issues may notify us of the issue(s) desired and include \$2 per issue desired in a check or money order or by credit card. (Minimum credit card order is \$9.) No shipping charge in U.S. and Mexico; Texas residents add 7.5% sales tax. Shipping charge of 30 cents per issue to Canada. For other foreign delivery, add 50 cents per issue surface mail, \$2 per issue air mail. No discounts on orders of sets. All prices U.S. funds.

OUT OF STOCK: Vol 1, nos. 1-2, Vol 2, no. 1

## Miscellany

TI-Forth Disks (2 disks, program and demo disks, no manual) . . . \$6.00  
 MICROpendium Index (2-SSSD disks, XBASIC required) . . . \$5.00  
 Disk of programs from one issue of MICROpendium (must be a subscriber to order) . . . \$4.00  
 12 monthly disks of programs appearing in each edition of MICROpendium (must be a subscriber to order/starts with April 1989) . . . \$40.00  
 Magazine holders (12/set-add \$1 shipping/order) . . . \$3.00

Send name, address, product(s) ordered, check, money order or Visa/MasterCard number and expiration date (\$9 minimum on credit card orders \$9) to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680. (Foreign orders write for postage fees.)

## Tell us about it

Please let us what columns or features you like the most about MICROpendium. Rank your selections in order of preference using this form. Return it to us when you renew your subscription.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

Other suggestions: \_\_\_\_\_

Send me the next 12 issues of MICROpendium. I am enclosing \$ \_\_\_\_\_ in a check or money order in U.S. funds. Or bill my    (Check one)

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

Card No. \_\_\_\_\_

Minimum credit card order is \$9

Signature \_\_\_\_\_ (required on credit card orders)

Mail to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ ZIP \_\_\_\_\_

The numbers on the left of your mailing label indicates the cover date of the last issue on your subscription.

v6,n7

SECOND CLASS