

MICROpendium

Covering The TI99/4A Home Computer And Compatibles

Volume 3 Number 3

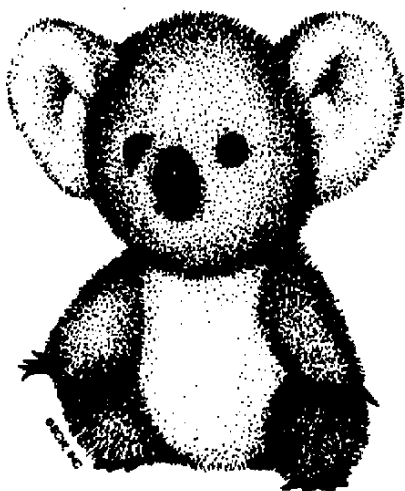
April 1986

\$1.50

Lou Phillips shows Myarc's 'card computer' in Boston—page 12

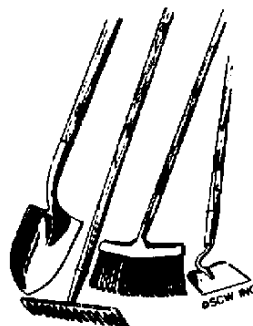


Photo: Randy Armstrong



Australia's coming TI fair—page 16

Tools for programmers—page 22



Texas Instruments TI-99/4A — COMPUTERS, COMPONENTS AND SOFTWARE.....

TEX+COMPTM

America's Number One TI computer retailer
TI-99/4 PRODUCTS AT PROFESSIONAL PRICES

The largest selection of software for the TI-99/4A



Tex Comp continues to stock the world's largest selection of TI Software. The TI Software library on module, disk and cassette was developed from 1979-1983 at a cost of millions 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.

MANAGEMENT

INFORMATION MANAGEMENT MODULES

PHM 3006	Home Financial Decisions	4.95
PHM 3007	Household Budget Mgt.	4.95
PHM 3012	Securities Analysis	19.95
PHM 3013	Personal Record Keeping	15.95
PHM 3016	Tax/Invst Rec Keep (Disk Req.)	4.95
PHM 3022	Personal Real Estate	4.95
PHM 3044	Personal Report Generator	10.95
PHM 3035	Terminal Emulator II	9.95
PHM 3111	TI Writer (word processing)	35.75
PHM 3113	Multiplan (spreadsheet)	35.95

DISKETTE PROGRAMS

PHD 5001	Mailing List (PIO Upgrade)	12.95
PHD 5003	Personal Financial Aids	9.95
PHD 5021	Checkbook Manager	9.95
PHD 5022	Finance Manager	19.95
PHD 5024	Inventory Management	19.95
PHD 5027	Invoice Management	19.95
PHD 5029	Cash Management	19.95
PHD 5038	Lease/Purchase Decisions	9.95
PHD 5075	TI Writer/Multiplan Upgrade	9.95

CASSETTE PROGRAMS

PHT 6003	Personal Financial Aids	9.95
PHT 6038	Lease/Purchase Decisions	9.95

EDUCATION

MODULES

PHM 3002	Early Learning Fun	4.95
PHM 3003	Beginning Grammar	4.95
PHM 3004	Number Magic	4.95
PHM 3006	Physical Fitness	4.95
PHM 3010	Music Maker	9.95
PHM 3020	Weight Control & Nutrition	10.95
PHM 3021	Touch Typing Tutor	10.95
PHM 3084	Early Logo Fun	11.95
PHM 3144	TI Logo II (32K Req.)	19.95
PHM 3109	Early Reading (Speech)	9.95
PHM 3015	Reading Fun	9.95
PHM 3043	Reading On	9.95
PHM 3047	Reading Roundup	9.95
PHM 3048	Reading Rally	9.95
PHM 3082	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 3050	Numeration I	9.95
PHM 3051	Numeration II	9.95
PHM 3059	Scholastic Spelling 3	9.95
PHM 3060	Scholastic Spelling 4	9.95
PHM 3061	Scholastic Spelling 5	9.95
PHM 3062	Scholastic Spelling 6	9.95
PHM 3068	Computer Math Games VI	9.95
PHM 3090	Milliken Addition	9.95
PHM 3081	Milliken Subtraction	9.95
PHM 3082	Milliken Multiplication	9.95
PHM 3093	Milliken Division	9.95
PHM 3094	Milliken Integers	9.95
PHM 3095	Milliken Fractions	9.95
PHM 3098	Milliken Number Reasoning	9.95
PHM 3099	Milliken Laws of Arithmetic	9.95
PHM 3100	Milliken Equations	9.95
PHM 3101	Milliken Mass of Formulas	9.95
PHM 3114	Alien Mix	9.95
PHM 3115	Alien Addition	9.95
PHM 3117	Dragon Mix	9.95
PHM 3118	Minus Mission	9.95
PHM 3119	Meteor Multiplication	9.95
PHM 3177	Face Maker	9.95
PHM 3178	Story Machine	9.95

DISKETTE PROGRAMS

PHD 5008	Music Skills Trainer	9.95
PHD 5018	Market Simulation	9.95
PHD 5030	Speak & Spell (Speech Ed Req.)	9.95
PHD 5031	Speak & Math (TE II Req.)	9.95
PHD 5042	Spell Writer (TE II Req.)	9.95
PHD 5028	Bridge Bidding I	9.95
PHD 5039	Bridge Bidding II	9.95
PHD 5041	Bridge Bidding III	9.95
PHD 5020	Music Maker Demo (Module Req.)	9.95

CASSETTE PROGRAMS

See disk versions for requirements i.e. TEII		
PHT 6008	Music Skills Trainer	9.95
PHT 6011	Computer Music Box	9.95
PHT 6018	Market Simulation	9.95
PHT 6031	Speak & Math	9.95
PHT 6042	Spell Writer	9.95
PHT 6028	Bridge Bidding I	9.95
PHT 6039	Bridge Bidding II	9.95
PHT 6041	Bridge Bidding III	9.95

MBX UNIT \$39.95

BRIGHT BEGINNINGS SERIES

PHM 3154	Terry Turtle's Adventure (MBX Expansion)	9.95
	System Required	
PHM 3155	I'm Hiding (MBX Expansion)	9.95
	System Required	
PHM 3156	Horsey Hunt (MBX Expansion)	9.95
	System Required	
PHM 3157	Sound Track Trolley (MBX Expansion)	9.95
	System Required	

ARCADE PLUS SERIES

PHM 3148	Championship Baseball (MBX Expansion)	9.95
	System Required	
PHM 3149	Space Bandit (MBX Expansion)	9.95
	System Recommended	
PHM 3150	Sawermia (MBX Expansion)	9.95
	System Recommended	
PHM 3151	Bigfoot (MBX Expansion)	9.95
	System Recommended	
PHM 3152	Meteor Belt (MBX Expansion)	9.95
	System Recommended	
PHM 3153	Super Fly (MBX Expansion)	9.95
	System Recommended	

HOME ENTERTAINMENT

MODULES

PHM 3009	Football	9.95
PHM 3018	Video Games I	4.95
PHM 3023	Hunt the Wumpus	4.95
PHM 3024	Indoor Soccer	9.95
PHM 3025	Mind Changers	10.95
PHM 3030	Amazing	4.95
PHM 3052	Tomestone City	4.95
PHM 3053	TI Invaders	4.95
PHM 3054	Car Wars	4.95
PHM 3057	Munch Man	4.95
PHM 3042T	Tunnels of Doom (with cass.)	9.95
PHM 3042D	Tunnels of Doom (Disk)	9.95
PHM 3056	Alpine	4.95
PHM 3110	Christmas Trail	4.95
PHM 3112	Perseus	4.95
PHM 3031	The Attack	4.95
PHM 3033	Blaslo	4.95
PHM 3033	Blackjack & Poker	9.95
PHM 3034	Hustle	9.95
PHM 3036	Zero Zap	9.95
PHM 3037	Hangman	9.95
PHM 3038	Connect Four	9.95
PHM 3067	Othello	9.95

SPECIAL OFFER

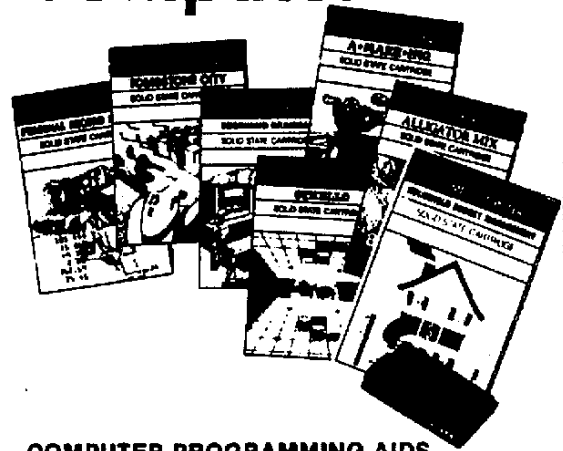
Brand New Original Black & Silver TI-99/4A console only \$79.95. Runs all third party modules and comes with 1 year TI factory warranty.

*Shipping, handling & insurance on this special offer is \$10.00 (Continental U.S.) to any UPS deliverable address. HA, AL, Canada and APO slightly higher.

Texas Instruments TI-99/4A Home Computer

Tex-Comp purchased TI's inventory of these outstanding titles in order to continue its support of the TI-99/4A user, and also continually acquires inventory from leading retailers and distributors who have discontinued home computer sales.

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



PHM 3041T	Adventure & Pirates Adv. (Cass.)	6.95
PHM 3041D	Adventure & Pirates Adv. (Disk)	6.95
ADVENTURE SERIES ON CASS OR DISK (SPECIFY)		
	Adventureland	9.95
	Mission Impossible	9.95
	Voodoo Castle	9.95
	The Count	9.95
	Strange Odyssey	9.95
	Mystery Fun House	9.95
	Pyramid of Doom	9.95
	Ghost Town	9.95
	Savage Island I & II	9.95
	Golden Voyage	9.95
	Ironheart Adventure (Not Scott Adams)	9.95
	SPECIAL ALL ABOVE ADVENTURES ON DISK OR CASSETTE INCLUDING IRONHEART	49.95
	Buckaroo Bonzai	19.95
	Soccer of Geymorgue Castle	19.95
	Spiderman	19.95
	Hulk	19.95

DISKETTE PROGRAMS		
PHD 5002	Ti-Trek (with new TEI Ver.)	9.95
PHD 5010	Mystery Melody	9.95
PHD 5015	Oldies But Goodies I	9.95
PHD 5017	Oldies But Goodies II	9.95
PHD 5025	Sat. Night Bingo (Speech) Ex-Basic	9.95
PHD 5037	Draw Poker (Ex-Basic Req.)	9.95
CASSETTE PROGRAMS		
PHT 6022	Ti-Trek TE-II & Speech	9.95
PHT 6010	Mystery Melody	7.95
PHT 6015	Oldies But Goodies I	7.95
PHT 6017	Oldies But Goodies II	7.95
PHT 6025	Sat. Night Bingo (Speech) Ex-Basic	7.95
PHT 6037	Draw Poker (Ex-Basic Req.)	7.95

TI ARCADE STYLE MODULES AND RECENT RELEASES		
PHM 3149	Space Bandit (MBX Expansion System Recommended)	9.95
PHM 3150	Sewerworks (MBX Expansion System Recommended)	9.95
PHM 3151	Bigfoot (MBX Expansion System Recommended)	9.95
PHM 3152	Motor Ball (MBX Expansion System Recommended)	9.95
PHM 3153	Super Fly (MBX Expansion System Recommended)	9.95
PHM 3220	Microsurgeon	9.95
PHM 3219	Super Demon Attack	9.95
PHM 3224	Moonweeper	9.95
PHM 3145	Snaggit	5.95
PHM 3228	Hopper	4.95
PHM 3233	Burgertime	9.95
PHM 3194	Jawbreaker II	5.95
PHM 3227	Congo Bongo	15.95
PHM 3198	Treasure Island	11.95
PHM 3199	Return to Pirates Island	11.95
PHM 3225	Buck Rodgers	15.95
PHM 3226	Star Trek	15.95
PHM 3222	Fathom	9.95
PHM 3148	Munchmobile	11.95
PHM 3197	Slymoids	15.95

COMPUTER PROGRAMMING AIDS

MODULES		
PHM 3028	Extended Basic & Manual	49.95
PHM 3055	Editor Assembler	19.95
PHM 3058	Mini Memory (With Writer)	38.95
DISKETTE PROGRAMS		
PHD 5007	Teach Yourself 99/4A Basic	9.95
PHD 5019	Teach Yourself Ex-Basic	9.95
PHD 5004	Programming Aids I	9.95
PHD 5005	Programming Aids II	9.95
PHD 5012	Programming Aids III	9.95
PHD 5077	Programming Aids I, II, & III	24.95
PHD 5067	Beginning Basic Tutor	9.95
PHD 5078	Text to Speech (English)	9.95
PHD 5068	TI Forth (Ed Assem. Req.)	19.95
PHD 5078	TI Forth Demo Disk (Ed Assem.)	9.95
PHD 5079	Forth Source Code (2 Disks)	11.95
CASSETTE PROGRAMS		
PHT 6005	Programming Aids I	9.95
PHT 6007	Teach Yourself 99/4A Basic	9.95
PHT 6019	Teach Yourself Ex-Basic	9.95
PHT 6067	Beginning Basic Tutor	9.95

MATH AND ENGINEERING

DISKETTE PROGRAMS		
PHD 5008	Math Routine Library	9.95
PHD 5008	Electrical Engineering Lib.	9.95
PHD 5013	Graphing Package	9.95
PHD 5016	Structural Engineering Lib.	9.95
PHD 5044	AC Circuit Analysis	9.95
CASSETTE PROGRAMS		
PHT 6008	Math Routine Library	9.95
PHT 6008	Electrical Engineering Lib.	9.95
PHT 6013	Graphing Package	9.95
PHT 6016	Structural Engineering Lib.	9.95
PHT 6044	AC Circuit Analysis	9.95

TI-COUNT SMALL BUSINESS SOFTWARE

General Ledger	99.95
Accounts Receivable	99.95
Accounts Payable	99.95
Inventory	99.95
Payroll	99.95
Mail System	99.95

ALL 6 FOR \$349.95

Send for New 1986 Tex-Comp catalog & buyer's guide only \$2.00 (comes with \$5 savings certificate)

Drastic Reductions



VISA	MASTERCARD	SEND ORDER AND MAKE CHECKS PAYABLE TO	TEX- COMP TM	TEXAS INSTRUMENTS
HOLDERS CALL DIRECT			P.O. BOX 33064 - GRANADA HILLS, CA 91344	AUTHORIZED DEALER
(818) 366-6631				
add 3% for credit card orders				
<p>TERMS: All prices F.O.B. 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). Prices and availability subject to change without notice. We reserve the right to limit quantities.</p> <p>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 9% sales tax.</p>				

Contents

MICROpendium

MICROpendium is published 12 times annually in Round Rock, Texas. No material published in the pages of MICROpendium may be used without permission of the publisher. Computer user groups that have signed 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 in 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-enclosed, stamped envelope is included.

All editions of MICROpendium are mailed from the Round Rock (Texas) or Smithville (Texas) Post Office. Subscriptions are \$15 for 12 issues, delivered via third class mail. In Canada, add \$3.50. Subscribers in the United States who wish first class delivery may also add \$3.50 to the basic subscription price.

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

Telephone: (512) 255-1512

Source: TI4596

John Koloen.....Publisher

Laura Barnes.....Editor

Mack McCormick.....Technical Editor

Coming next month

- Super TI keyboards
- Review of MAXIMEM
- Printing FORTHFONT labels

Table of Contents

Myarc's 'card computer' debuts

New product is up and running (for a while, at least) at the New England Faire.....Page 12

Subprograms and subroutines

Using them, and telling them apart.....Page 14

Australia's TI fair

U.S. participation invited by modem by fellow TI users Down Under.....Page 16

Techie Corner

Mack McCormick answers readers' questions....Page 18

Structured BASIC programming

Building blocks and tools for your programs.....Page 22

Finding that User Note

At last, an index and a program for frustrated MICROpendium readers.....Page 28

DIJIT Systems' RGB conversion

Compatibility with several more types of monitors is on the way.....Page 32

Reviews

U.S. Open Tennis.....Page 38

PRBASE.....Page 39

Newsbytes

New users' groups, a Bible books game, and Unisource bows out of the TI market.....Page 41

User Notes

Counting words in TI-Writer files, more on ACCEPT IT, and keeping time with Triple Tech.....Page 43

Classified.....Page 46

Sensational Prices!!!

...On Our Most Popular
Hardware and Software!!

MYARC™ 128K Card!!

Step up to big-time personal computing with this powerful new card from Myarc for your expansion box! Now you can have access to bank-switched 32K blocks of memory. This exciting card also includes RAM disk and print spooler routines. Store programs or files in memory and load them instantly! A fantastic productivity aid for users of TI-Wheel or similar programs where files are changed frequently. The print spooler lets you "print" at high speed directly to memory — great for downloading files or text.

34324 Myarc 128K Card \$199.00
Extended BASIC Level IV. Requires Myarc 128K card.
36179 \$69.95
SPECIAL! Myarc 128K card and Ext'd. BASIC Level IV. \$249.00

NEW

from CorComp.
**Now Your Computer
Can Keep Perfect Time!**

TRIPLE TECH

An exciting new multifunction board from CorComp that plugs into your expansion box.

Clock/Calendar: "Real-time" clock lets you access Year, Month, Day, Hour, Minutes and Seconds easily from BASIC or Extended BASIC.

Printer Buffer: Holds up to 64K of output copy and features a duplication function.

Speech Synthesizer Connection: Let's you hide your speech synthesizer inside your expansion box.

All three functions in one economical package!

34643 Triple Tech \$129.00

CLOCK/CALENDAR

Stand-alone unit plugs into the side of the computer and keeps track of Year, Month, Day, Hour, Minutes and Seconds. Battery backup keeps time for over six months, even when power to the computer is turned off.

34639 Clock/Calendar Stand Alone \$79.95

THE 69¢ **micro** DISKETTE!

Are you paying too much for diskettes? Try our first quality, prime, 5 1/4" diskettes (no rejects, no seconds) at these fantastic sale prices and save, save, SAVE! Disks are packaged in boxes of 50; each box contains 5 shrink-wrapped 10-packs that include diskettes in sleeves, labels, and write-protect tabs.

Each diskette is certified to be 100% error free and comes with a lifetime warranty (if you have a problem, we'll replace the diskette). All diskettes include hub reinforcement rings and write-protect notch.

Box of 50
32391 SS, DD Diskettes \$34.50
(69¢ each!)

32403 DS, DD Diskettes \$44.50
(69¢ each!)

★★★★★★★★★★★★★★★★

FREE!

"EVERYTHING BOOK"

For the

TI Home Computer

Order Item #25982

★★★★★★★★★★★★★★★★

AVAILABLE FROM
YOUR FRIENDS AT

TENEX
Computer
Express
T.M.

**We gladly accept
mail orders!**

P.O. Box 6578
South Bend, IN 46680

**Questions? Call
219/259-7051**

SHIPPING CHARGES
ORDER AMOUNT CHARGE
less than \$20.00 \$3.75
\$20.00-\$39.99 4.75
\$40.00-\$74.99 5.75
\$75.00-\$149.99 6.75
\$150.00-\$299.99 7.75
\$300 & up 8.75

Ad
M4M

**Special Price just for
Micropendium readers...**



**ONLY
\$99.95**

HALF-HEIGHT DISK DRIVE

This double-sided, double-density half-height disk drive provides up to 360K of storage when used with CorComp or Myarc disk controller cards (operates as single-sided, single-density drive with TI controller for 180K of storage). The drives are shipped "bare" and can be installed in TI Peripheral Expansion Box; or may be used externally by installing in Box with Power Supply. Hook-up cables are required; please contact our Customer Service Department to determine correct cables for your system.

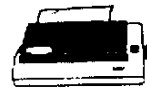
31031 Disk Drive \$99.95
20164 External Box with Power Supply \$59.95

BEST-SELLING HARDWARE!

STAR MICRONICS SG-10 PRINTER

33251 \$229.00

Latest model! Draft quality at 120 cps, near letter quality at 30 cps. 2K print buffer.



30235 AXIOM PARALLEL PRINTER INTERFACE \$ 69.95

29784 CORCOMP RS-232 INTERFACE \$127.00

29802 CORCOMP 9900

MICRO-EXPANSION SYSTEM \$329.00

MYARC or CORCOMP RS-232 CARD \$ 79.95

32972 MYARC DISK CONTROLLER CARD \$169.95

29770 CORCOMP DISK

CONTROLLER CARD SALE! \$159.95

13315 CORCOMP 32K MEMORY CARD \$ 99.95

**20164 BOX WITH POWER SUPPLY
for external disk drive \$ 59.95**

31173 WICO 3-WAY

GATELOCK JOYSTICK \$ 24.95

10285 WICO TI ADAPTER \$ 4.95

31007 PROSTICK II. Comes with TI adapter \$ 24.95

37321 SUPER STICK. Requires TI adapter \$ 7.95

13329 NAVARONE CARTRIDGE EXPANDER \$ 29.95

NO EXTRA FEE FOR CHARGES



We verify charge card addresses.

**ORDER TOLL FREE
1-800-348-2778**

Comments

Help for tech-lorn, rate increase

As you will note elsewhere, our technical editor, Mack McCormick, is now writing a question and answer column for MICROpendium. It's called Techie Corner. Over the years, there have been a lot of questions submitted to MICROpendium by readers, some of which we could answer, some we couldn't. We are forwarding technical questions from readers to Mack, who will continue to provide answers to as many as he has the time and we have the space to print.

RATE INCREASE COMING

MICROpendium has had only one subscription rate increase since its inception, and now it's getting ready for its second. The new subscription rate increase is scheduled to take effect May 30. From that date regular subscriptions will be increased from \$15 to \$17 and first class subscriptions will increase from \$18.50 to \$20.50. (Texas residents will have to add 5.125 percent state sales tax. Overseas rates will be increased from \$21.50 for surface mail to \$23.50 and air mail will increase from \$35 to \$37.

We're telling you now so that if you would like to renew your subscription at the current rate you may do so and save a couple of bucks. You don't have to wait for notice from us that your subscription is about to expire to "re-up," as it were.

The price of back issues is also going to increase, from the \$1.35 we're currently charging to \$1.50 per copy. The cover price will remain \$1.50 for now.

Advertising rates are also going to go up, the first ad rate increase we've ever had. This is due to the fact that our cir-

culation is continuing to increase. (Current advertisers, those who have advertised in the past three issues, will receive the new rates this month.) The increases are necessary to cover postage costs that increased last summer as well as higher printing costs. (We're also going to increase the amount we pay for articles by 20 percent.)

Speaking of changes, starting with this issue MICROpendium is being mailed from the printing plant, right after comes off the press. We had been doing the mailing ourselves and the volume has gotten to the point where it has taken as long as four full days to get the magazines labeled, bundled, sacked and to the post office. We expect this new procedure to reduce this time to several hours. We hope it will result in better service to you.

A change resulting from this new mailing procedure is that we will no longer be able to stamp LAST ISSUE, RENEW NOW on covers of expiring subscriptions. Rather, we will send post cards the month that the subscription is to expire.

CONVERT BASIC UPDATE

A number of readers have reported difficulty with the "Convert BASIC to Extended BASIC" User Note, which appeared in the February 1986 issue. Anyone who does not have a card which supports POKE will probably not be able to get the program to run. We ran it using a CorComp Disk Controller Card, which supports POKE. The TI Disk Controller card does not.

—JK

Reviewed in MICROpendium

1984

February: B-1 Nuclear Bomber, Tandon TM-100 Disk Drive, Void, Beanstalk Adventure, Microsurgeon, On Gaming, Database 500
March: Star Trek, Escape From Balthazar, Garkon's Getaway, Sky Diver, Mail-Call, Pro-writer 8510 Printer
April: Monthly Budget\$ Master, Budget Master, Home Budget, Thief, Donkey Kong, Khe Sanh
May: Companion Word Processor, Q*Bert, Mad-Dog I & II, Programs for the TI Home Computer

June: Creative Expressions Accounts Receivable/Accounts Payable, CDC 9409 Disk Drive, Starship Concord, Lost Treasure of the Aztec, ASW Tactics II
July: Theon Raiders, Introduction to Assembly Language for the TI Home Computer, Game of Wit, Pole Position
August: TE-1200, Tower, Galactic Battle,

Galaxy

September: Wycove Forth, 99/4 Auto Spell-Check, QUICK-COPYer, Wizard's Dominion, Anchor Automation Mk XII Modem
October: Killer Caterpillar, ZORK I, Defender
November: 9900 Disk Controller Card/Manager, Super Bugger, Transtar 120S printer, Floppy-Copy, Data Base-X
December: Gravity Master, Data Base Manager System, Learning 99/4A Assembly Language Programming

1985

January: Super Sketch, Foundation Computing 128K Card, PTERM-99, TI-Runner
February: Super Extended BASIC, Beginning Assembly Language for the TI, ZORK II
March: Morning Star Software CP/M Card, WDS/100 Winchester Disk Drive, Sketch Mate, BMC Color Monitor
April: 9900 Micro Expansion System,

Disk + Aid, Gemini 10X-15X

May: Character Sets and Graphics Design, Draw 'N Plot
June: GRAPHX, DATA BASE I
July: Acorn 99, Advanced Diagnostics
August: Model Dow-4 Gazelle, TI-Artist, PC-KEYS, Not-Polyoptics' Bankroll
September: Midnite Mason, Myarc 32K/128K Card, GRAPHX Companion
October: 4A/TALK, Extended BASIC II Plus, XB Detective, Console Writer 2.1
November: Foundation Z80A/80-column cards, 9900BASIC, Adventure Editor
December: Display Enhancement Package, Triple Tech

1986

January: BITMAC, Starcross
February: Night Mission, Peripheral Diagnostic Module, BA-Writer
March: Super Duper, Tunnels of Doom Editor, Business Graphs 99

SST Expanded Basic Compiler System

"The most powerful high level language available for the T.I./4A"
NOW ONLY ~~\$40.00~~ \$25.00

The **SST EXPANDED BASIC COMPILER** contains all of the features of the **SST BASIC COMPILER**, plus most of the features of **EXTENDED BASIC**. It also includes many commands that are not available in **TI BASIC** or **TI EXTENDED BASIC**. A major feature of the **SST EXPANDED BASIC COMPILER** is the ability to add your own commands. If you have need of a command not commonly found in Basic, you can easily add it to our compiler (*Editor/Assembler* module only).

The **SST EXPANDED BASIC COMPILER** package translates a Basic program into TMS9900 machine language, resulting in a great gain in program execution speed. The compiled commands are up to 160 times faster than the corresponding commands in **TI BASIC** or **EXTENDED BASIC**. For a comparison we used our Compiler to run the benchmark program for making change in the April 1984 MICROpendium. This program takes over 30 minutes in **TI BASIC**. When the program was compiled using the **SST EXPANDED BASIC COMPILER**, the program ran in 37 seconds. In fact, you can compile the program, save it on a disk, recall it, run it and still be considerably faster than **TI BASIC**.

A second benchmark program appeared in the November 1984 issue of the MICROpendium (page 22). This program took:

209.4 seconds in TI BASIC	7.2 seconds in TI FORTH
219.6 seconds in TI EXTENDED BASIC	4.9 seconds in WYCOVE FORTH
2.5 seconds in SST BASIC or EXPANDED BASIC	

The **SST EXPANDED COMPILER** is also many times faster than **TI PASCAL**.

The **SST EXPANDED BASIC COMPILER** contains most of the standard features of **EXTENDED BASIC** and is especially useful for number crunching, text manipulation and for producing arcade type games. However, some translation of a Basic program may be required.

SST Software has invested about two and one half man-years in the development of this package. With the requirements of *Memory Expansion*, *Disk Drive* and either *Editor/Assembler* or *Mini-Memory* the **SST EXPANDED BASIC COMPILER** gives you the following features:

- The ability to use sprites, sound, joyst, graphics, and string functions.
- The ability to write and compile up to 470 lines of Basic code.
- The ability to link compiled programs together as one large system.
- The ability to call up to seven compiled programs from a **TI Basic** program.
- The ability to dimension up to 1800 element floating point arrays.
- The use of many of the floating point function statements available in **TI Basic**.
- The ability to do integer arithmetic for extremely fast execution speed.
- The ability to dimension up to a 12000 element integer array using *Memory Expansion*.
- The use of strings for input, output, character definition and text manipulation.
- The ability to write and debug a Basic program using the **TI** console and interpreter, and then compile it without the need for retyping.
- The ability to use **Bit Map** mode for high resolution graphics.
- The ability to add up to five of your own commands.
- The ability to access a disk drive and the **RS232** interface.
- The ability to store the compiled program permanently on disk so that it never needs to be compiled again.
- The ability to use the **TI Loader** for faster loading speeds of compiled programs.
- A manual of more than 60 pages.

SST Expanded Basic Compiler System with a High Resolution Graphics Package and Text Mode **NOW ONLY ~~\$50.00~~ \$35.00**

This version gives you all the features of the **EXPANDED COMPILER** plus 40 column mode and 12 new commands for high resolution graphics.

NEW!!

PRE/SST Program

\$30.00

A program translator aid which facilitates preparing existing Basic and Extended Basic Programs for processing by the **SST EXPANDED BASIC COMPILER SYSTEM**. Makes developing new programs easier. It converts multiple line statements to single lines. It allows you to convert floating point variables to integer variables for increased speed. It also allows you to use such things as numeric constants and takes care of defining variables and constants. The **PRE/SST PROGRAM** helps you tap the full power of the **SST COMPILER SYSTEM**. (Requires *Extended Basic*)

SST SOFTWARE, INC.

BOX 26 • CEDARBURG, WI 53012 • (414) 771-8415

Feedback

At the stock show with the RAM?

Noticed the announcement of a new computer on the front page of the March issue of your publication.

I guess that it must have something to do with milk and butter.

Where does one purchase one of these COWPUTERS?

Ed Shaper
Ballwin, Missouri

Drawings overlooked

Mr. Kurosh Amirkhani's article (March 1986) on providing accessible COPY/CLEAR switches for the Cor-Comp Triple Tech card was both innovative and interesting, but I think you overlooked the most fascinating feature of his presentation: the detailed drawings.

Those illustrations all appear to be computer-generated and contain a wealth of detail. (If I am being hoodwinked by a clever pen and pencil artist, then all I can say is "well done!")

But if the origin of the illustrations is from a computer, then I would very much like to see a future article by Mr. Amirkhani which discusses how he generated those superb drawings. I am particularly interested in knowing what software and hardware were used.

Carlton J. Florence
Jacksonville, Florida

(In the letter accompanying the submitted article, Amirkhani noted that the drawings were produced with TI-Artist.—Ed.)

Fast disk initialization

The average time for the Disk Manager II to initialize a brand new single-sided disk is about 55 seconds. The time needed to initialize a box of 10 disks will take approximately 10 minutes or more. And double that if you, like me, flip all disks to double-sided. To me, initializing of new disks is about the most boring TI-DOS operation. Imagine placing disks in and out of the drive and staring at the on-screen num-

bers rolling from 0 to 358 TWENTY TIMES!

I discover a way to shorten this process with no apparent side effect. If you have the Navarone Widget, the process is easier. If not, you will still manage without much difficulty.

Here is how I do it. If you listen carefully, the drive clicks 40 times when initializing a new disk. After that the numbers on the screen will start to run from 0 to 358. As soon as the numbers run to about 20, reset the computer either by pressing FCTN "+" (QUIT) or the Widget reset button. That's it. You now have a fully initialized disk. Get back into DM II mode and repeat the above steps for the next new disk.

The time it takes to initialize one disk by this method is down to about 20 seconds. And so far I have yet to find anything wrong with disks that are initialized this way. I welcome comments from more knowledgeable users.

Colin Lee
Singapore

Two mistakes

I have two things to say. The first is that in all of the 43+ copies of DRAGON STORM shipped, only \$30 was received in donations. I wasn't pleased with the response, so I decided to try to market my next program myself.

That was my second mistake (the first was selling DRAGON STORM as freeware). I only sold one copy of PIRANHA. It is reasonably priced, \$8.50 cassette, \$9.50 diskette. Since only one copy was sold, there is little incentive to produce new programs. I don't think it is worthwhile to put 50+ hours into a program that doesn't bring anything in. It saddens me when 99ers ask for more software, but don't buy any. I tried my best to answer this need for software, but nobody listened.

Howard Uman
3913 Sybil Road
Randallstown, MD 21133

On compatibility

John Topham (Feedback, Dec. 1985) addressed some complaints against MICROpendium and software producers because of incompatibility of some software and the Myarc disk controller card. He used as his justification the fact that Myarc built the original controller card and that Myarc had followed all of the DSR protocols.

One point that seems to have been overlooked is that there is more to compatibility than just the DSR. To make a component completely compatible, it must be both software and hardware compatible. To use non-TI addressing schemes on a circuit board and then try to correct for it by patching the DSR is great for software compatibility for those who are willing to limit themselves to what TI thought they should be able to get out of the machines. However, those software vendors that decide they want to go beyond what TI thought they should have should not be limited because some hardware vendors take sloppy design shortcuts. I find it difficult to fault a software vendor whose program does not work with a component that deviated from the TI design. If the software works with the original TI product then it is up to the third-party hardware vendor to insure that his design is such that the software will work with his product and not the reverse.

Larry R. Thompson Sr.
Wapwallopen, Pennsylvania

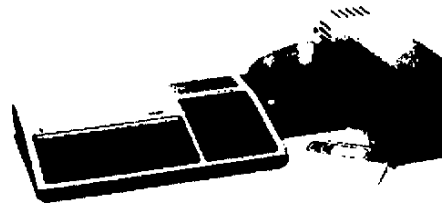
Battery replacement

The safe and sane way to replace the 3V lithium battery in your TI Mini-Memory is to call the TI repair center number from page 10 of MICROpendium, Jan. 1986, and ask for a Sanyo CR2430 with tabs, TI Part #1034598-0002 at a cost of \$2.48 each.

Those familiar with soldering techniques can take it from there. Those not familiar with the technique should find a friend who is and order more than one battery to defray the \$3 mini-

(Please turn to Page 10)

9900 + FOR THE TI99/4A THE ULTIMATE 99/4A EXPANSION SYSTEM AT A SPECIAL INTRODUCTORY PRICE FROM TEX-COMP™



CorComp

TEX-COMP, the undisputed leader in supplying the 99/4A User, has now put together the finest and most complete expansion system ever offered for the TI99/4A.

COMPLETE EXPANSION SYSTEM NOTHING ELSE TO BUY!

- **9900 Expansion Box & Regulated Power Supply (UL Approved)**
- **32K Memory Upgrade** Adds 32K bytes of Random Access Memory to your system.
- **Double Sided/Double Density Disk Controller** (operates up to 4 drives)
- **RS232 Interface** Lets you add a wide range of other accessories, such as printers or telephone modems, one parallel and 2 serial outputs.
- **1 SS/SD Disk Drive** Allows you to store and retrieve data on 5 1/4-inch single-or double-sided floppy diskettes.
- **1 Disk Drive Case & Regulated Power Supply** Handles two 1/2-height drives easily (UL or LAC Approved)
- **New Disk Manager with Improved Disk Utilities**
- **All Cables & Instructions** Including a free TI RS232 Y-Cable.

**ALL FOR
\$379.95**
Plus S&H

For above system with full size DS/DD Disk Drive

\$399.95

For above system with a pair of 1/2-height Drives

\$399.95

Other leading CorComp Hardware Values:

CorComp RS232 Card (for TI P-Box)	79.95
CorComp 32K Card (for TI P-Box)	99.95
CorComp DS/DD Controller (for TI P-Box)	NEW LOW PRICE 149.95
CorComp 9900 System with Free RS232 Y-Cable	NEW LOW PRICE 299.95
CorComp Stand Alone RS232 with Free Y-Cable	NEW LOW PRICE 99.95
NEW CorComp Stand Alone 32K	NEW LOW PRICE 89.95
NEW Triple Tech P-Box Card (Clock/Buffer)	109.95
NEW 9900 Clock Stand Alone	69.95
"Grom Buster" (for 1983 Consoles)	24.95
Load Interrupt Switch (with FREE Screen Dump Program)	19.95
NEW PDI Diagnostic Module	24.95

Also available from TEX-COMP at NEW LOWER PRICES:

TI-99/4A Console w/1-year warranty (Black & Silver model)	79.95
New Star SG-10 Printer w/TI Instructions (replaces Gemini 10X same specs but improved letter quality) with Free Cleaner Kit	239.95
1/2-Height DS/DD Disk Drive (2 will fit in P-Box)	99.95
Full Size SS/SD Disk Drive (exact replacement for TI 1250)	79.95
Full Size DS/DD Disk Drive	99.95
Drive Enclosure with Regulated Power Supply for 2 1/2-height or 1 full Drive	59.95
Cable Kit for 2 1/2-height Drives (for installation in P-Box)	29.95
Cable Kit for Stand-Alone Drives (specify TI or CorComp system)	29.95
RS2323 Y-Cable	10.95

SEND \$2.00 FOR NEW 1986 CATALOG WHICH INCLUDES A \$5.00 SAVINGS CERTIFICATE.



VISA and MASTERCARD
HOLDERS CALL DIRECT
(818) 366-6631

SEND ORDER AND MAKE CHECKS PAYABLE TO

TEX-COMP™

Texas Instruments



P O BOX 33084 — GRANADA HILLS CA 91344 AUTHORIZED DEALER

add 3% for credit card orders

TERMS: All prices F.O.B. 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.

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 9% sales tax.

"The Leader of the Pack"

Feedback

(Continued from Page 8)

mum S&H.

The people at TI repairs
Still cares.

M. Rice
Scottsboro, Nebraska

On program name

Asgard Software started discussing with several prominent members of CompuServe's TI Forum last September the possibility of creating a companion package for the soon-to-be-released TI Artist Version 2.0 which I had tentatively dubbed "Artist Companion." I had gone so far as to write Chris Faherty, the author of the program, a letter of intent in October, and stated plainly that I also intended to call the package "Artist Companion."

It wasn't until three weeks later that I got a response—at the November Chicago Faire. At this show Mr. Faherty and I met briefly to discuss the project (which is ironic considering that we live no more than 30 miles apart and yet had to go to Chicago to meet). He endorsed the idea, considering that my well-known GRAPHX packages were promoting (and still are) sales of GRAPHX. Not only did he endorse the idea, but he also gave us a copy of TI-Artist V2.0 to carry out the project, and confirmed the name we planned to give the product ("Artist Companion"). I also gave him copies of our GRAPHX Companion I and II.

At that point the project bogged down a bit—quite candidly due to the fact that we were easily selling five times as many GRAPHX Companions as we could manufacture, and I had little time to manage development. It wasn't until early January that the project got under way. In late December I had placed an order with my printer for disk labels with the name "Artist Companion." By the middle of January we were far enough along to get documentation written and sent out to be typeset. It was then that I opened up my January issue of MICROpendium and saw an ad for Texaments—which at that time I con-

sidered only a Myarc dealer—for a product named "Artist's Companion." I was shocked and outraged!

As I learned, we weren't protected against such a thing. Unfortunately, Asgard never sought to make "Artist Companion" a trademark. We had copyrighted an item with that name in December, but we never sought a formal trademark. This is quite frankly because we produce a lot of products, and the \$200-\$500 cost of each trademark would make us have to raise our prices (but this policy has changed due to this incident, unfortunately). Since we had a considerable sum of money invested in this name we decided we had to proceed with the project under our given name.

In researching the market I realized that people would have trouble making a distinction between two products of nearly the same name. Therefore, our advertising was geared more towards stating our advantage in the industry (as the originators of the concept of drawing program companion), our reputation for quality products, and the well-known talents of our authors, and less to actually making a comparison in quantity (which would be just as non-objective as a quality comparison in this case).

Honestly, we thought that someone was trying to use our hard-earned reputation to their advantage when they heard of our product on CompuServe! In discussing the matter later with the owner of Texaments (a discussion where no decision was made as to what should be done about this situation) I was told that David Rose isn't on CompuServe, and developed his product in the relative isolation of Ohio. I must assume it was an honest mistake.

So now we have the situation today—two companies are producing two completely different products with nearly the same name. Our company began the product in September but another company beat us to market because we were too busy selling software to develop our product fast enough.

Finally, in an associated issue, we would like to protest that the manner in which all of our imitators package their products devalues our own products by association. Asgard Software spends a considerable amount of money to professionally package our products, and then we sell them unprotected at a very affordable price. All this is to combat piracy by eliminating the rationalizations for it. Our imitators sell the stuff for the same price all right, but usually slap on a label done on a printer, and include documentation they copied at their corner drugstore. Anyone purchasing their products, hence, would believe that ours are also cheaply packaged as well. I had hoped that when we set the standard for price that we would have also set it for quality as well. Apparently I was wrong—some companies are willing to shave pennies at the expense of their product.

Chris Bobbitt
Asgard Software
Rockville, Maryland

Assembly programs

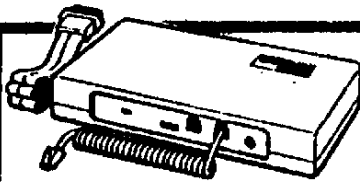
I...was glad to see your featuring an assembly language tutor series. I feel most of the TI users now are hard core and have at least the Mini-Memory module and are wanting to use their machine at its highest level.

I am currently looking for a source of public domain assembly programs for the TI and would appreciate any help from you or your readers. Unfortunately I do not own a modem

Don Stylinski
Glendale, Arizona

(We are not certain of all the contents in their library, but would suggest contacting the Amnion Helpline, (415) 753-5581 between 9 a.m. to 4 p.m. Pacific time, or by mail, 116 Carl St., San Francisco, CA 94117—Ed.)

The Feedback column is for readers. It is a forum to communicate with other readers. The editor will condense excessively lengthy submissions where necessary. We ask that writers restrict themselves to one subject for the sake of simplicity. Our only requirement is that items be of interest to persons who use the TI99/4A home computer. Mail Feedback items to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.



The SIGNALMAN MARK IIII TI-99/4A COMPATIBLE 300 BAUD MODEM

\$74.95
including shipping & insurance

ACCESSORIES
9V-DC
Optional
Power Supply
\$10.95 p.p.
For Mark IIII only

Finally, a low cost, direct connect, high quality and super reliable TI-99/4 and 99/4A compatible modem that comes complete and ready to use—just plug it into a RS232 interface or expansion card. **TEII and TEIV + communications software included FREE**

VOLKSMODEM

The Complete Low-Cost Plug-In Modem.

\$39.95

It puts computer-to-computer communications within easy reach of every personal computer owner.

Just plug Volksmodem between any wall phone jack and telephone and put your computer into instant communication with thousands of others. It's that easy. No extra parts or tools are necessary—just one adapter cable and software is all that's needed.

MONEY SAVING SPECIAL. Get the Volksmodem (reg. \$59.95), 99/4A modem cable (reg. \$12.95), and Terminal Emulator II (reg. \$9.95) an \$80+ value for **ONLY \$39.95.**

SPECIAL: Compuserve Starter Kit with 5 free hours of connect time. Reg. \$19.95, **ONLY \$10** with any modem on this page when you mention this ad.

SPECIAL OFFER
Free CompuServe
Executive Level
Starter Kit
(Sign on + 2 free
premium hours with
Volks 12)



VOLKSMODEM 12

300/1200 Intelligent Modem

Hayes Smartmodem Command Structure

- 300/1200 Baud • Bell 103 & 212 A Compatible
- Auto Answer/Auto Dial
- Automatic Speed Mode Selection • Cable Included (18")
- 2-Year Warranty • RS232C Compatible
- Enhanced Noise Immunity

\$199.95

**COMPLETE WITH TI-99/4A CABLE,
TEII AND TEIV +**

NEW!

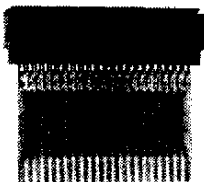
A GREAT COMBINATION FOR THE TI-99/4A

The new CorComp Load/Interrupt Switch
and "SUPER DUMP" Screen Printout Software

CorComp

(by Danny Michael)

By special arrangement with Danny Michael, a talented 99/4A programmer, Tex-Comp is offering a copy of his "Screen Dump" **FREE** with each purchase of the new CorComp Load/Interrupt Switch.



Complete
\$19.95
postpaid

Comes Complete with Switch and Software

Print the screen of a BASIC or Extended BASIC program at the press of a function key. Also print the screen of many modules, including Music Maker, Tax Investment Record Keeping, Personal Real Estate, etc.

No need to worry about not having a serial printer for the older TI modules. This new plug-in Load/Interrupt Switch easily inserts between the console and the speech synthesizer or P-Box. Requires 32K, Disk Drive, Extended BASIC. Works only with Epson, Gemini 10X, Star SG10, TI855, and other dot matrix fully Epson compatible printers. Software dumps at regular size, double size, sideways and can reverse screen.

NOTE: A ProWriter version of Super Dump is also available (must specify with order).

 add 3% for credit card orders 24 Hour Order Line	VISA and MASTERCARD HOLDERS CALL DIRECT (818) 366-6831	SEND ORDER AND MAKE CHECKS PAYABLE TO TEX-COMP™ P.O. BOX 12864 - GARDENA, CA 90249 AUTHORIZED DEALER	TEXAS INSTRUMENTS
--	---	--	------------------------------

TERMS: All prices F.O.B. 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). 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 8% sales tax.

"The Leader of the Pack!"

SEND \$2.00 FOR NEW 1986 CATALOG WHICH INCLUDES A \$5.00 SAVINGS CERTIFICATE.

Boston sees Myarc 'card computer' at New England 99 Faire April 5

Up and running at the New England 99 Faire in Boston April 5, though it fizzled by afternoon, was the new "computer-in-a-card," from Myarc.

Lou Phillips of Myarc says that "one of those little wires must have shorted out" and that printed circuit boards expected by the company will prevent future occurrences.

Phillips, who announced the card model at the TICOFF held in New Jersey in March, says that Myarc will continue in two areas, in development of the keyboard model, the case for which was shown at the Chicago TI-Faire in November, and the card model, which he says, can be developed "a lot faster."

He says the card has a 512 configuration comparable to an Atari 520 or "a full-blown IBM PC," featuring 640K memory, 128K VDP RAM and 512 CPU RAM.

It has a sound chip similar to TI's in the 99/4A with room in the memory map to address other sound chips, Phillips says.

It interfaces to other cards that plug

into a peripheral expansion box. At the New England Faire, it was operating with a 512K card, a TI RS232 and the Myarc floppy disk controller. It features an MS mouse interface, he says.

The type of joystick interface is still undecided, he notes.

"It's a real hard decision," he says. "TI went industry non-standard with its joysticks. Everyone who has a non-TI joystick has an adaptor. So do we go with the TI approach or the Atari-Commodore approach? There is a great impetus to go the same way as TI but by the same token TI is no longer manufacturing joysticks."

Phillips says his computer features RGB and composite video output, using the 99/38 chip, with 128K video RAM. It has 80 column in text mode, 512 x 212 pixels in the bitmac graphics mode and 512 x 424 in the interlaced mode.

"In the super high resolution mode any individual dot can be one of 256 colors," Phillips says. "Nobody, not IBM or Commodore, has that capabili-

ty which the 99/38 chip allows."

When hardware is "100 percent" for the card-based computer ("we have one more interface to get up and running," the keyboard interface, which interfaces to an IBM standard keyboard), the formal announcement including name, shipping date and price will be made. Phillips says he anticipates this as being approximately April 18.

Software will be available for saving cartridges to disk, he notes, as the computer will not support the cassette or cartridge port.

He says the company is also developing BASIC III, which he describes as "a step beyond" Extended BASIC II.

A feature of the program is interrupt-drive function keys, enabling a user to aim a function key and press it, go to a GOSUB routine and return to execution level, he says. Thus, he says, a software developer can give a user what the function keys mean and how to react within a program.

BASIC III will support a mouse interface, he says.

Fairsoft sets BasicSort program

Fairsoft, of Fairfield, Connecticut, is introducing a new sort utility for the TI.

Andy Dessoff of Fairsoft says the company expects to have the product ready for market in late April or early May.

The program, BasicSort, runs in conjunction with BASIC, Dessoff says. He says it is written in assembly language and "extremely flexible."

He says BasicSort is called from a "shell program" written in BASIC with the Editor/Assembler or Mini-Memory module, or in Extended BASIC. All sorting operations are

under the control of the shell program.

BasicSort is said to sort data on any combination of up to 16 sequence fields in ascending and/or descending sequence. Sequence fields can be numeric, strings or string segments, according to the manufacturer. With strings or string segments, according to the manufacturer, BasicSort does not "alphabetize," but does a genuine sort operation on the full length of any string or segment.

Dessoff says that, by use of an appropriate shell program, BasicSort can sort files of practically unlimited size, and that, if the user needs to sort only

part of a file, the shell program can select and pass to the sort program only the needed records of the file and only the needed part of each record.

The program comes with a manual and requires 32K memory, one disk drive and Editor/Assembler, Mini-Memory or Extended BASIC.

Fairsoft has produced products for IBM computers, but this is the company's first TI product, Dessoff says. BASIC Sort will sell for \$15 plus \$2.50 shipping and handling.

For further information, or to order, contact Fairsoft, 1041 Church Hill Rd., Fairfield, CT 06432.

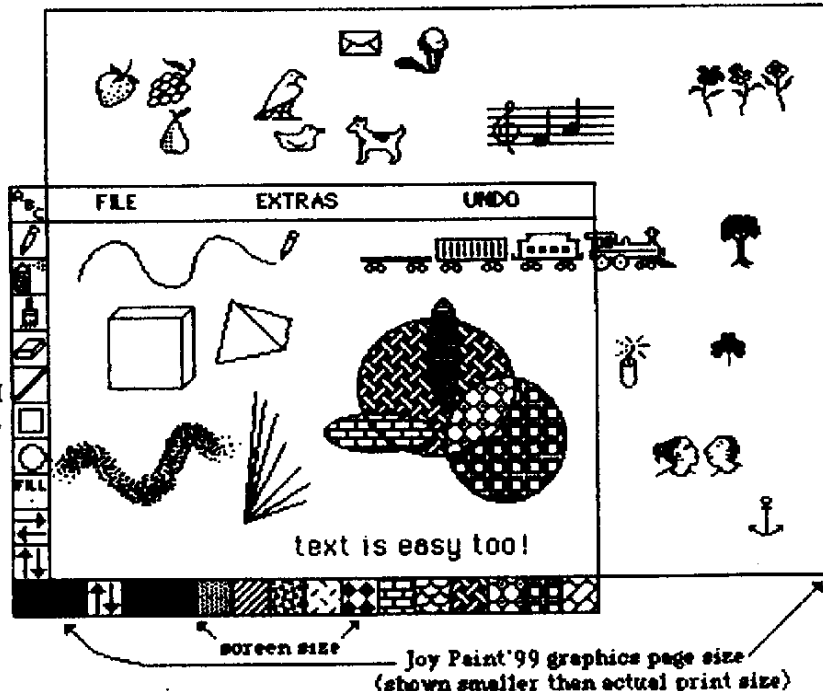
NEW! FROM THE CREATORS OF BANNER '99 AND EXTENDED BUSINESS GRAPHS.....

JOY PAINT '99

(C) Copyright 1986

ENTIRELY
JOYSTICK
CONTROLLED!!

USE TOOLS,
SUCH AS
PENCIL,
ERASER,
PAINT BRUSH
CIRCLE, OVAL
BOX, LINE &
TEXT!



92% MORE
GRAPHICS
SPACE THAN
PREVIOUS
TI GRAPHICS
PROGRAMS!!

THE SCREEN
ACTS LIKE
A WINDOW!

REQUIRES

TI-99/4A, 32K,
Disk drive,
Joy Stick, and
one of the
following:
Extended Basic,
Editor/Asm,
or Mini-Memory.

Epson compatible
printer such as
Gemini 10x or
15x, TI Impact,
etc. is optional.

(soon other
printers too!)

Our all new 100% assembly language program features graphic capabilities found in no other software application. Use JOY PAINT '99 to create signs, charts, diagrams, advertisements, or graphics of any type. JOY PAINT '99 is sophisticated, yet simple to use. In fact, the user never needs to touch the keyboard; all functions are joystick controlled. There are no complicated function keys to remember, just simple on-screen TOOLS. JOY PAINT '99 allows circles and ovals to be drawn with incredible speed and precision. Lines, boxes and rectangles can also be quickly drawn! Additionally, the FILL, PAINT BRUSH, and SPRAY-CAN tools allow filling and painting in any one of twenty six selectable PATTERNS! JOY PAINT '99 also feature 8 different brush shapes!

A 'pull down window' contains many more features that make creating and manipulating graphics fun and easy. Any object can be INVERTED, ROTATED, FLIPPED VERTICALLY or HORIZONTALLY, COPIED, MOVED, OR STORED ON A CLIPBOARD! A MAGNIFY feature allows graphics to be increased. A ZOOM OPTION, called FATPIXELS, allows fine single dot editing.

JOY PAINT '99 also contains dozens of features not found in any other graphics application. For instance an 'UNDO' feature that instantly 'takes back' the last portion of work the user performed! Its DIRECTORY feature can catalog your diskettes! JOY PAINT '99 CONSERVES DISK SPACE, by not saving the redundant blank areas in your graphics! Printouts can be made directly in normal, or double size, and in single or double density! Be among the first to experience this unique and practical program; ORDER YOURS TODAY.....\$49.95 POSTPAID.

COMING SOON:
JOY PAINT '99
COMPANION!

With hundreds
of pre-designed
graphics!

GREAT LAKES SOFTWARE
804 E. Grand River Ave., Howell, MI 48843

By Lee Wilkerson

(Please turn to Page 16)

Chicago-Area TI-99/4A Users' Group, Inc.
Don Jones (Membership Chairman)—Dept. M2
P.O. Box 578341 Chicago, Illinois 60657

The most innovative expansion card ever designed for the TI 99/4A. This peripheral expansion memory card gives you new features, more power and control than ever before. Your computer can now perform tasks beyond all limits. It is packed with unique functions; to transform your 99/4A.

Features:

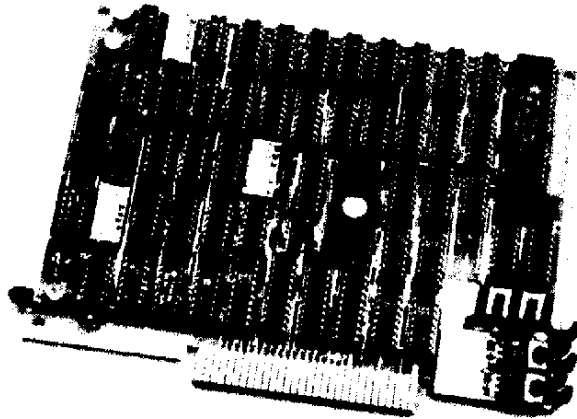
- > 128k RAM/GRAM memory • 64k RAM and 64k GRAM
- > Expandable to 512k • Two = 1 megabyte RAM
- > Use "Load" files for custom system operation from main menu screen
- > Add an extra 13k to Basic programs
- > Load and run assembly programs
- > Load and run GPL programs
- > Save GROM modules and programs to disk
- > Save ROM programs to disk
- > Load and run ROM/GROM programs
- > Load console GROMS 0-2 into the GRAM card, modify the 99/4A console operating system for new features!
- > Menu access up to 8 choices (modules, etc.) from main screen
- > Hex monitor allows you to change CPU, VDP and GROM memory directly from keyboard input
- > All software is on card. No disk required.
- > Change CRU address base via switches
- > Review module library from main menu

Fully compatible with TI, CorComp and Myarc disk controllers. Switch selection ensures compatibility with all current and future expansion cards. Tested with Foundation 128k and Myarc 128k memory cards, Horizon RAMdisk, Myarc and TI RS-232 cards. Now you can access all the true power of your TI 99/4A at a remarkable price. Anything you wish can now be accomplished! Download your most used modules. Modify programs to suit your needs. With the imminent 80 column card, you can have a "new" computer now, equal to any comparable machine on the market. Place your order today.

from Mechatronic

128k^o 512k RAM/GRAM CARD

the ULTIMATE EXPANSION for the TI 99/4A



Available: NOW
\$249⁵⁰ US FUNDS

with the GPL
Package: \$310

99 MOUSE w/software \$98
Extended Basic II plus \$75
128k Stand-alone memory β
printer port incl \$149
MAXIMEM \$145

TI DOS w/icon
interface \$25

and AVAILABLE VERY SOON:

80 Column Card - 'Library' Card - Internal 32k
New module Command Centre. w/ battery
GPL Memory Module and more!



**Ryte
Data.....**
MILLENNIUM COMPUTERS

210 MOUNTAIN STREET,
HALIBURTON, ONTARIO K0M 1S0

SUBPROGRAMS—

(Continued from Page 14)

system than errors in non-modular software. These messages make it easier to trace the path that created the error. A typical set of messages might be:

```
FILE ERROR
IN 1260
IN SORT
CALLED FROM MENU
CALLED FROM DRIVER
CALLED FROM 100
```

This is interpreted as: line 100 called subprogram DRIVER, which called subprogram MENU, which passed data to subprogram SORT which encountered a file error in line 1260.

Subprograms can be saved individually on disk and merged into other programs as needed. You don't have to change the names of their variables; just specify which names in the main program correspond to those in the subprogram. As an additional note, subprograms have access to DATA and IMAGE statements located in the main program or other subprograms, but not DEF statements. Any user-defined functions which are required must be defined within each subprogram which will access them. Files opened anywhere in the main or subprograms are accessible from any subprogram.

There are some caveats to keep in mind when using subprograms. Errors in them are not always handled well by

the computer. Syntax errors in DEF statements especially may cause the system to crash. Beware of recursion, where a subprogram calls itself directly or indirectly, which may work well, or it may crash or lock up the system. Extended BASIC is supposed to catch this type of error, but in my experience it does not. And never jump out of a subprogram with a GOTO or GOSUB statement. It is not only bad programming practice, the computer will not be able to keep track of what is going on, and there is no telling where things will end up.

ODDS AND ENDS DEPT.

Do you ever use the statement "ON BREAK NEXT" to prevent a program from being halted during execution? It helps prevent a ruin from accidentally being stopped during important data processing, especially file input/output, and it allows "FCTN 4" to be used as a valid keypress. But it doesn't always work. Even while this statement is in effect, a program can be broken into during a CALL SOUND statement, and sometimes during file input/output, especially printing.

Some programmers want a short routine to allow program activity to be controllable with either joystick or keyboard input. Most such routines are complicated and time-consuming, and some authors go so far as to have two separate versions of software for the different types of control. Here is a

one-liner that handles the job, and allows all eight directions to be input from either the keyboard or joystick. It also checks to see if the fire button is pressed. It requires that two arrays be initialized before use:

```
100 DIM KX(20), KY(20) :: FOR I=1
TO 8 :: READ S, KH(S), KV(S) ::
NEXT I
110 DATA 1,0,-4,3,-4,0,4,4,0,5,-4,4,6,
0,4,7,4,4,15,4,-4,16,-4,-4
```

During the program the same response will be produced whether joystick No. 1 or the left side of the keyboard is used. The standard TI keys are used for the eight directions: E, X, S, D for vertical and horizontal motions, and W, C, Z, R for diagonal motions. The vertical component is stored in variable V and the horizontal component in variable H. If the fire button is pressed K will equal 18. The calling routine is:

```
500 CALL JOYST(1,H,V) :: CALL K
EY(1,K,S) :: H=H OR KH(K+1) ::
V=V OR KV(K+1)
```

This routine is fast and compact, but it has two drawbacks. First, the two arrays are needed, which eats into memory and slows execution down a little. Second, if the routine is used in a moving/shooting game, it is not possible to move and fire at the same time if keyboard input is used. The arrays are dimensioned to 20 to prevent a program crash if the "1" key is accidentally hit.

Australian fair offers exhibit space, ads

American producers of hardware and software can exhibit their wares at the first Australian TI Fair 11 a.m.-7 p.m. June 14 at the Malvern Town Hall.

Peter Gleed, exhibition manager, says producers can take a complete stand at a cost of \$250 or show their products on the stand donated to the American TI99/4A industry. Members of the Melbourne Users Group, which is sponsoring the fair, will staff the stand and distribute any catalog or

pamphlet producers send for that purpose, Gleed says.

Advertising is also available in the 100-page four-color magazine being produced for the fair at \$250 a full page, \$150 a half page and \$100 a quarter page.

Exhibitors already signed up for the fair include Canberra Television, the largest television and video rental in Australia, which was also the first large company in that country to offer the TI99/4A to the public; Telecom

Australia, the national telephone organization that runs Vitel, a nationwide bulletin board; Brother Printers; Silver Reed Printers; Texas Instruments, which will show its TI-74, a large hand-held calculator-style machine which has as its language BASIC and Pascal in ROM fully expandable with RAM cartridges; Sendata, which manufactures modems and acoustic couplers and have won Australian awards for excellence,

(Please turn to Page 20)

OUR BEST MONITOR VALUE EVER!

**BLACK
MATRIX TUBE
FOR BRILLIANT
COLOR**

\$149.95

**PERFECT
FOR
VCR's
TOO!**

Specifications:

Picture Tube:

14" diagonal

Inputs:

Composite video (RCA plug)

Audio (RCA plug)

Resolution:

330 lines horizontal

320 lines vertical

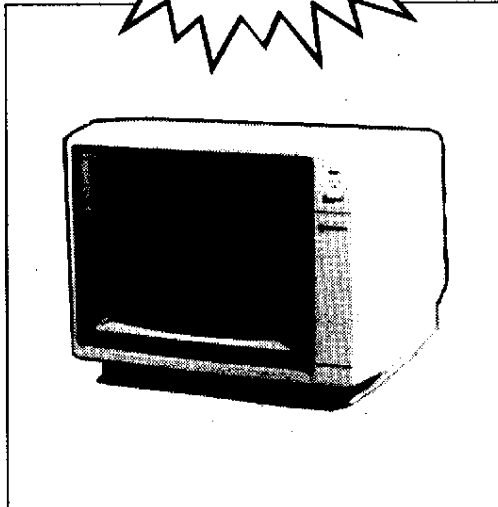
Scanning Frequency:

15.75 KHz Horizontal

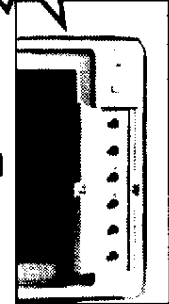
60 Hz Vertical

Dimensions:

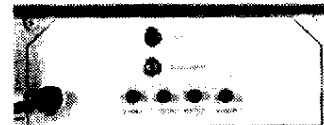
13.3" W x 13.1" H x 16.3" D



**Convenient
Front Panel
Houses
Controls**



Rear Panel



Even turned off, this monitor looked different... its black matrix picture tube appeared much darker than the other monitors we compared it to, and its sleek contemporary design and convenient front-panel controls made it stand out from the pack.

When we turned it on, though, we were *really* impressed. The color was outstanding across the entire spectrum: rich blacks, vivid colors, and brilliant whites. The difference is the black matrix tube: a standard picture tube (turned off) looks gray, and will never get any darker, even when turned on! Our monitor, though, yields colors that are truly remarkable — even some of the "hard to read" color combinations were unusually clear.

Everything about this monitor is top notch. The built in audio speaker provides the best sound we've heard in a monitor of this size. Controls for volume, brightness, contrast, color, tint and sharpness are concealed behind a side panel door on the front of the monitor along with an on/off switch and "power on" indicator light. To top it all off, the warranty is unmatched... one year on parts and labor, two years on the picture tube!

And we couldn't be more pleased with the price. Can you imagine all this quality and value for only \$149.95? This is the best value we've ever offered on a monitor and supply is limited, so order today and start enjoying the best in a color display.

This outstanding monitor is made by Samsung, a leading producer of high quality consumer electronics products.

40728 14" Composite Color Monitor \$149.95

37424 Monitor Cable (required). Works with TI 99/4A, C64, C128 (in composite mode), and many others. \$7.95

AVAILABLE FROM
YOUR FRIENDS AT

**TENEX
Computer
Express**
T.M.

*We gladly accept
mail orders!*

P.O. Box 6578
South Bend, IN 46860

**Questions? Call
219/259-7051**

SHIPPING CHARGES
ORDER AMOUNT CHARGE
less than \$20.00 \$3.75
\$20.00-\$39.99 4.75
\$40.00-\$74.99 5.75
\$75.00-\$149.99 6.75
\$150.00-\$299.99 7.75
\$300 & up 8.75

Ad
M4M

NO EXTRA FEE FOR CHARGES



We verify charge card addresses.

**ORDER TOLL FREE
1-800-348-2778**

Techie Corner

Checking disk head alignment

By **MACK McCORMICK**
Technical Editor

Hello from Germany to all my many friends and fellow TI users. I apologize for the delay in getting started with this column but "Uncle" managed to lose my computer for a couple of months. I have a lot of letters to this column to catch up on. Please be patient, we'll get to them a few at a time. Much is going on here with the Germans in the TI community. I promise a full report soon.

The purpose of this column is to exchange technical information on this computer system. I will do my best to answer all questions. They do not have to deal only with assembly language. I acknowledge up front that I do not have a corner on the technical knowledge market and I strongly en-

courage others to submit their ideas here for all to share. Please send your mail to MICROpendium, Attn: Mack. If you send a SASE I'll do my best to provide a personal reply if the volume doesn't get too heavy. I do have the source code to just about everything so that makes my job a bit easier.

OK, let's get started. Edward Mashburn of Roberta, Georgia, asks several good questions: Does anyone make a disk alignment program for the TI and where may I get technical information on TEAC 55B drives?

I am not aware of a program on the market which allows you to check head alignment and other operating parameters for our drives. Miller's Graphics does sell a disk diagnostic program which may meet some of your needs. It will allow you to check the

drive speed and step the heads through a complete cycle. No information is given on how to adjust the speed and I strongly recommend-unless you have the necessary technical training-you allow a qualified service person to do the work. If you had the experience and test equipment you could use a head alignment disk and monitor the output of the drives to adjust the tracking. If you are really interested you can order a service manual for TEAC 55B drives from: TEAC Corporation of America, 7733 Telegraph Rd., Montebello, CA 90640.

Howard Uman of Randallstown, Maryland, wants to know if there is a way to save to cassette using filenames. Unfortunately there isn't. TI never intended for us to use cassettes for

(Please turn to Page 20)

OLD DARK CAVES

A GRAPHICS ADVENTURE GAME

ENTER THE OLD DARK CAVES IN A QUEST TO RESCUE THE LAST FRIENDLY DRAGON OF OLD EARTH FROM A GROUP OF UNPLEASANT WIZARDS AND THEIR ALLIES. IT SEEMS THAT SINCE THE ORIGINAL VERSION OF OLD DARK CAVES THAT THE WIZARDS HAVE FOUND MORE HELPERS. THEY ALSO HAVE HAD MORE TIME TO PREPARE FOR YOUR ARRIVAL. BEING A HERO WAS NEVER EASY.....

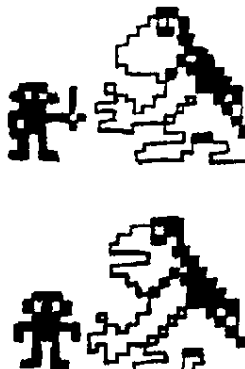
FEATURES: SIX LEVELS, OVER 240 CAVES, 28 VARIED MONSTERS, ALL MULTICOLORED, MANY HAVE DECISION MAKING CAPABILITY. ALSO INCLUDED ARE TREASURE CHESTS, GOBLET, AMULETS, POTIONS, KEYS, FOUNTAINS, LETHAL SNAKES, SEVERAL TRAPS AND A HEALER AND DARK CAVES TRADER. ON SCREEN DISPLAYS OF PLAYERS CURRENT OPTIONS AND STATUS. OPTIONS ARE MENU DRIVEN. FAST RUNNING WITH IMPRESSIVE GRAPHICS.

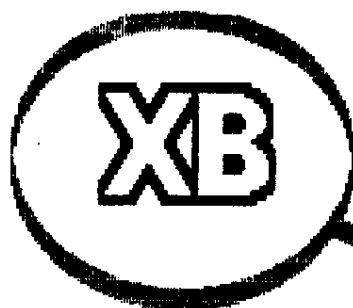
PROGRAM SIZE, OVER 88K BYTE. PROGRAMMED IN EXTENDED BASIC SUPPORTED BY 60 ASSEMBLY LANGUAGE SUBROUTINES. DESIGNED TO RUN IN COMPLETE SECTIONS AVOIDING EQUIPMENT WEARING DISK I/O OPERATIONS.....FURNISHED UNPROTECTED. REQUIRES: 32K MEMORY EXP, XBASIC, DISK

ORDER FROM: DONN R. GRANROS
6320 4TH AVE SO.
MPLS, MINN 55423

PRICE 19.95 DELIVERED (CHECK OR M.O.)

FOOD	MONSTRT	0
FIREBALLS		52
AMULET		30
		45





Detective

If you develop, alter, or debug programs in either Basic or Extended Basic, ***XB DETECTIVE*** is definitely for you! This powerful utility works transparently in the Basic or Extended Basic environment and is instantly accessed with a touch of the ***HOT KEY*** without disrupting the current program resident in memory. ***XB DETECTIVE*** is fully menu driven, totally interactive with your programming environment, lightning fast, and may be used to perform the following functions:

List Variables: Assembles a complete list of variable names.

Find Variables: Locates the position(s) of any variable specified by the user.

Find Reserved Words: Locates the position(s) almost any reserved word specified by the user. (i.e. PRINT, GOTO, GOSUB etc.)

Delete Lines: Allows the removal of any block of lines specified using a starting and ending line number.

Find Strings: Locates the position(s) of any string in either quotes, data statements or subroutine CALLs.

Requires Extended Basic, 82K memory expansion,
and disk system. Printer is optional.

Special Offer
Only \$17.95

Texaments

53 Center Street, Patchogue, New York 11772

Mail orders please add \$2.00 for postage and handling. Sorry no C.O.D. or credit card orders accepted. Call our office (516-475-8489) or bulletin board service (516-475-6488) for more information. Dealer inquiries are invited.

TECHIE CORNER—

(Continued from Page 18)

anything but sequential access. To really do what you want we would need a recorder capable of fully remote operation to include fast forward and reverse search. Then the console would have to be modified to include the necessary hardware connections. That's the easy part. The cassette DSR routine is written in GPL (graphics programming language) and assembly language. It would require major modification. If you or others are "really" interested I'll rewrite the complete cassette DSR in runnable assembly language. Maybe then someone can figure out an easy way to add filenames.

Samuel Sloan of East Homer, New York, asks how to convert from Mini-Memory programs to Editor Assembler programs.

AUSTRALIA FAIR—

(Continued from Page 16)

design and export achievement; the Melbourne Users Group; the Sydney Users Group; the Brisbane and Tasmania users groups; the Adelaide and Perth users groups; and the Hunter Valley and Canberra users groups.

Every person attending the fair will receive a tape or disk of TI99/4A software, Gleed says. He also invites American users groups to communicate with Australian users during the fair via modem. All group stands will be fitted with a modem courtesy of Sendata, he says. He says American users groups need to contact him with information as to what their group is showing by April 30.

Users groups committed to communicating with the Australians via modem for the fair include those in Cincinnati, Ohio; Los Angeles, California; Lubbock, Texas; and Hamilton, Ontario, Canada.

For further information, contact the TI99/4A Users Group Melbourne, Inc., P.O. Box 280, Ashburton, Victoria 3147, Australia. (Address misprinted in March issue.)

Sam, that is something that gives many folks problems. Here are the conversions:

Remember any utility you use must be REferenced in your E/A program.

MM EA REference

```
BLWP @>6024 BLWP @VSBW VSBW
BLWP @>6028 BLWP @VMBW VMBW
BLWP @>602C BLWP @VSBW VSBW
BLWP @>6030 BLWP @VMBW VMBW
BLWP @>6034 BLWP @VWTR VWTR
BLWP @>6020 BLWP @KSCAN KSCAN
BLWP @>6018 BLWP @GPLLNK GPLLNK
BLWP @>601C BLWP @XMLLNK XMLLNK
BLWP @>6038 BLWP @DSRLNK DSRLNK
```

You must add the program entry point to the reference/definition table using a DEFinition opcode. e.g. DEF ENTER.

Finally, any address in the range >6000 to >7FFF must be placed somewhere else. For example: LWPI >70B8 should simply be changed to LWPI WS where WS has already been established as WS BSS 32 for your workspace. That's really about all it takes to convert.

Sam also asks where the DSR's are located, if they are burned into each peripheral, and if they can be changed. First, please read my recent tutorial on accessing the disk drive. I think that will answer most of your questions.

Yes, the DSR can be changed by swapping out the EPROM in the card

with a custom designed chip (a technique I frequently use). You can also access the chip in the card directly using your own DSR routine in expansion RAM (a future tutorial to be published). TI made it very easy to access all the DSR's in the cards via a standard DSRLNK routine. You simply set up a Peripheral Access Block and establish a pointer. The DSRLNK routine does the rest.

Finally, Sam asks how he can output to his PIO printer using the list option of the E/A editor. The easiest way to accomplish a listing from the editor is to SAVE to PIO. Please note that any place you use PIO with Editor/Assembler it must be followed by a period (i.e. PIO.). A minor TI bug.

Time to wrap things up for this month. Many more letters and tips next time. Please give me your questions and suggestions to ensure this column meets the needs of users everywhere for this grand computer. I would also like to take this opportunity to congratulate my best friend, Ron Albright, for his selection as the TI Contributing Editor for Computer Shopper. I'm sure he will provide a great service to us all.

Until next time. "ASSEMBLER EXECUTING."

Pilot 99 author dies at 22

Thomas P. Weithofer, author of the Pilot 99 programming language, died April 5 at Christ Hospital in Cincinnati, Ohio. He was 22.

Weithofer had been a computer science student and a member of the Cin-Day Users Group. He had suffered from cystic fibrosis.

He is survived by his parents, Frank W. and Marian R. Weithofer; five brothers, Robert Weithofer, Michael Weithofer, John Weithofer, James Weithofer and Frank Weithofer; two sisters, Mary K. Weithofer and Bridget Conroy; a grandmother, Alva C. Weithofer; and 15 nieces and nephews.

He was preceded in death by two brothers, Richard Weithofer and William Weithofer.

The funeral was held under the auspices of the Hodapp Funeral Home in Cincinnati. A Mass of Christian Burial was held April 8 at St. Vivian's Church in Cincinnati.

Memorial contributions may be made to the Christ Hospital Pulmonary Disease Fund, 2139 Auburn Ave., Cincinnati, OH 45219; or to the Ministry to the Elderly and Sick, Nerinx, KY 40049.



NEW

Schedule Manager

TI BASIC subset of this program was featured on the cover of HCM

Software that truly meets the needs of a productive worker (businessperson, office employee, homemaker, student, etc.) is as scarce as proverbial hen's teeth for the TI-99/4A user. The category of software that lets the user perform a task on a computer easier than by hand is almost nonexistent, with the exception of a few word-processors, spreadsheets, data-base programs, and utilities. That's why we at Asgard Software are particularly proud to introduce to you the newest addition to this very short list, SCHEDULE MANAGER. SCHEDULE MANAGER'S capabilities are impressive. It sports three major functions, that of a large appointment book, a useful calendar, and a handy notebook. All are integrated to a degree never before seen in TI-99/4A programs. For example, data from one function can be passed to the others with a single command. Such power is not otherwise available on programs costing less than \$250. Power isn't everything...If a program is too difficult to use, it doesn't matter how powerful it is. That's why we made SCHEDULE MANAGER about the easiest to use TI-99/4A program in existence. It features complete pull-down menus and interactive windows straight from a certain well-known Apple computer, a powerful and extensive "HELP" utility for whenever you need help with any of the terms used in the program, numerous prompts presented in ENGLISH which mean what they say, and of course, much, much more. Asgard Software didn't leave out usefulness either. The program has over 16 different menu options for easily using and maintaining your information, ample storage space for most needs, a full-screen editor for entering data quickly and easily, multiple appointment book capability, complete print options, and assembly language speed. Overall, SCHEDULE MANAGER is excellent for keeping a weekly, monthly or quarterly schedule, keeping lists of names and phone numbers (among other things), and even maintaining a log of expenses. It's a worthwhile and affordable investment for any user. It requires Extended BASIC, a 32K memory expansion unit, and a single disk drive. A printer is purely optional. SCHEDULE MANAGER can be obtained directly from us, or from your local Asgard Software dealer. Oh yes, it's unprotected too...

\$14.95

Asgard Software

POB 10306, Rockville MD 20850

Send for a free catalog of our other fine products

Structured BASIC programming

Building blocks and tools

By EMILE VERKERK

Structure [ME, fr. L. structura, fr. structus, pp. of struere to heap up, build] 1: the action of building 2: something arranged in a definite pattern of organization 3: the aggregate of elements of an entity in their relationships to each other.

In the beginning, there were big computers, several times the size of a football field. Programs written for these computers were hard-wired (the program was part of the wiring), and of necessity, very simple. All that these computers could do was add quickly.

Nowadays, computers fit on desktops and perform many different types of instructions, quickly and efficiently. Not only that, there is now software available so that we don't have to wire our computer to do a certain task. By using high-level languages such as BASIC, Pascal, and Cobol, we can instruct the computer to do just about what our imagination desires, save our instructions on cassette or disk, and then repeat the cycle of telling our computers what to do.

The scope of these three articles is to introduce to you, the concept of structured programming. Today's programs have become so complex, that even the simplest group of instructions can be difficult to understand. Structured programming entails a system of programming that not only simplifies programming immensely, but also allows us to look at a program six months after we've written it and lets us understand it.

As the definition above describes structure, so shall we apply it to programming. We'll see how to build a program with the proper building blocks and tools. We'll see how to arrange those blocks in a definite pattern. We'll understand how each building block depends on each other

in order to produce a working program.

As well, we'll explore basic programming tools, such as pencil and paper, HIPO charts, pseudocode, and the importance of documenting your program fully.

In this article we will set up a checkbook reconciliation program using structured programming techniques. In the second article, the program will be written, applying structured programming techniques in TI BASIC. As a finale, we will explore the debugging process and show you how easy it is to customize this program to meet your individual needs.

How to Start

The first step in writing any program is to find a sheet of blank paper and a sharp pencil to go with it. Having done this, we will attempt the most difficult step of writing any program. **DECIDE WHAT IT IS WE WANT TO DO.**

Having done this, we write at the top of our page "A Checkbook Reconciliation Program."

Fun, isn't it?

Having decided on what to do, we now look at how to do it. For this we put one of our structured programming techniques, the HIPO chart, to work.

HIPO stand for Hierarchy of Input, Processing and Output. What this means is, let's divide the program into sections, those for Input, those for Processing, and those for Output.

We'll call these sections modules. Now, modules have certain rules. Rule 1 is that modules must contain only information relating to a specific action. For example, a module which places headings on the screen should not be adding totals. This is called module independence and will become very important later on when we debug and modify our program.

The first module we place on our paper is the main module. It is from this section that everything in the program will happen. (See Illustration 1)

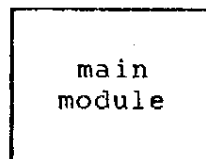


illustration 1

We then divide the program into 3 main areas, the initialization and set up, the actual processing, and what happens when we're finished. (See Illustration 2)

(Please turn to Page 24)

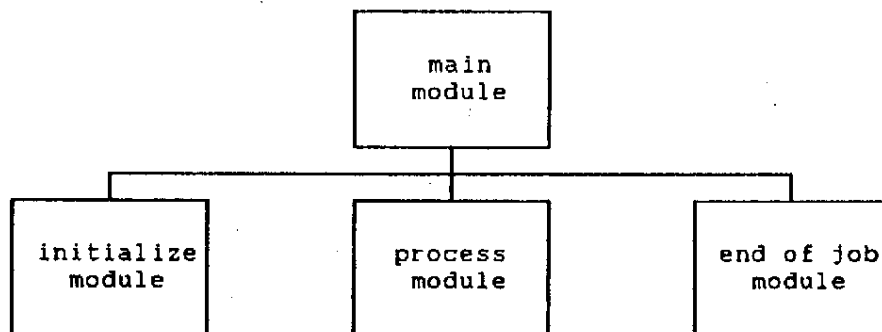


illustration 2

#1 Graphics Program

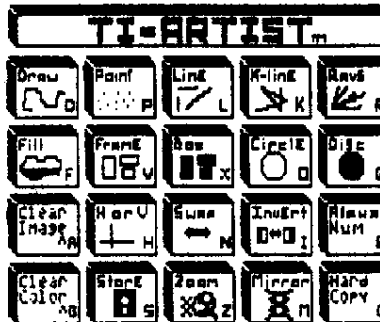
TI Artist

All New Version 2.0

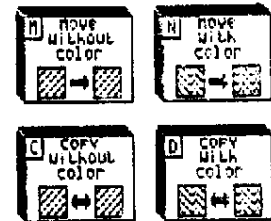
Powerful font, slide, and instance entry features.



Only \$19.95



Move, Copy, and Flip



User Defined Picture Areas

The extremely user friendly menu system (illustrated above) allows many powerful integrated functions. Provides excellent user adjusted screen dumps using Epson (compatible), Okidata 92 and 93, Axiom GP-100 and Prowriter printers. Disk drive, memory expansion, and either XB, E/A, or MM required.

TI Artist Support

Artist's Companion #1

A huge set of five disks that contain a complete set of graphics designs to be used with TI Artist. The package includes 25 character fonts, 160 small original pictures and 30 large original pictures. A must for TI Artist!

Complete Five Disk Set \$17.95

Artist's Companion #2

An all new set of graphic designs to be used with TI Artist. This package includes 13 character fonts and 60 small original pictures. Also included is Artist's Connection which allows you to use TI Artist instances in BASIC!

Complete Two Disk Set \$9.95

Display Master

An all new program which allows users to create TI Artist screen/slide presentations! 100% user defined and directed presentations can be made easy using Display Master's command language and any text editor (TI Writer, E/A etc)

Display Master Package \$14.95

Artist Extras

Aids to help the TI Artist owner with graphic designs. Included are 14 character fonts, 5 small pictures, 6 full screen pictures and DSR routines to allow you to use the Super Sketch pad and a mouse with TI Artist!

Complete "Flippie" Diskette \$6.95

ALL DRAWING PACKAGES

Only \$68.00

ALL SUPPORT PACKAGES

Only \$48.00

Texaments

53 Center Street, Patchogue, New York 11772

Mail orders please add \$1.50 postage and handling for each item ordered. Sorry no C.O.D. or credit card orders accepted. Call our office (516-475-3490) or bulletin board service (516-475-6468) for additional information. Dealer inquiries are invited.

STRUCTURED BASIC PROGRAMMING—

(Continued from Page 22)

Next, we further divide each module to see if we can make each one more independent of the other. During initialization, we may want to read in a file from either disk or cassette, we may want to redefine characters for graphics purposes, we may want to set program switches to zero. Whatever it is we want to initialize, this is the part of the program that we do it in.

Next, we subdivide the processing module into smaller modules. Here we have the screen layout, the keyboard input, the actual processing and the output generated by the program.

Finally, the end of the job routine. Do we want to go back and balance another checkbook or do we want to finish? Finishing means saving our information on cassette or disk, closing files and putting us back in TI BASIC.

Sometimes, though, we need the same module over and over again for specific purposes such as displaying the title on the screen or waiting for us to press a key to continue. These modules we call utility modules and as long as we call them that we can use as many on our HIPO chart as we want.

Look at illustration 3 and see the structure that is now evident in our checkbook program. See the flow of logic from top to bottom, from left to right. This tool, the HIPO chart, is one of the most powerful organizational tools available to a programmer.

As well, the HIPO chart becomes the first piece of documentation that you will be able to save with your program.

The second piece of documentation that you will need to keep is pseudocode. Pseudocode is an English representation of your HIPO chart. When we write pseudocode, we state what it is we want our program to do.

For example, the main module calls the initialization module, the processing module and the end of job module.

In pseudocode this would look like this:

Main module
do the initialization
do the processing

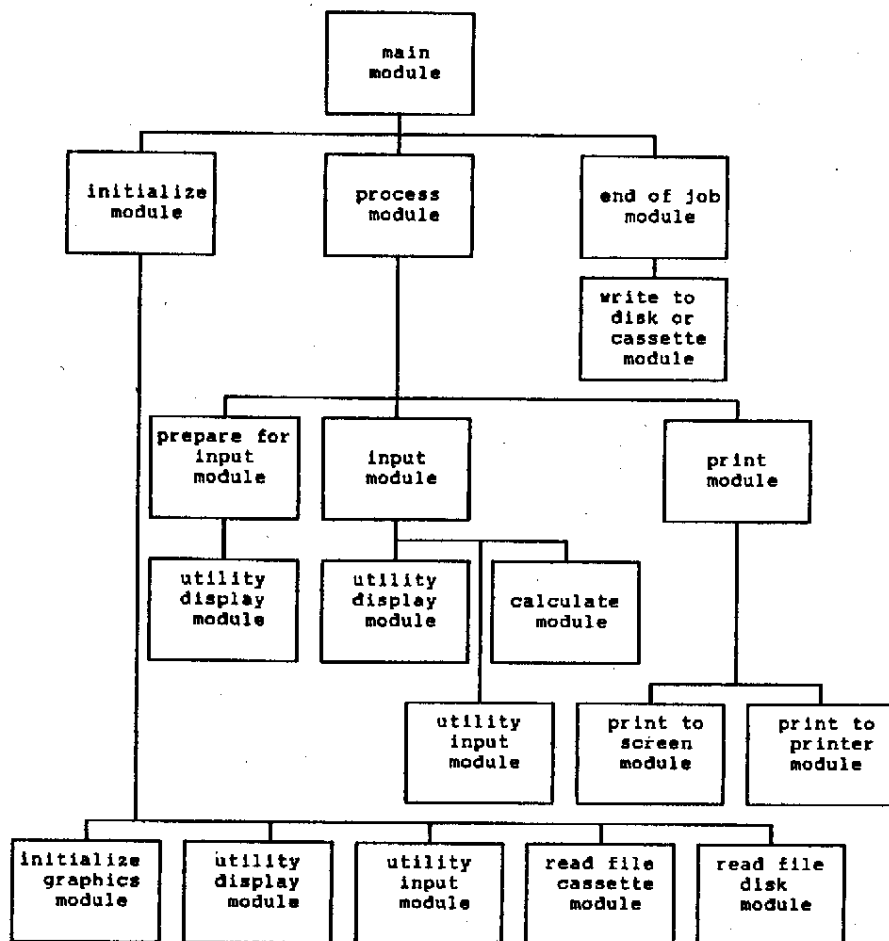


Illustration 3

do the end of job routine

Now in the initialization module we want to initialize the graphics characters, print a title on the screen, ask if we're using disk or cassette and read in a file if we have one.

In pseudocode this would be:

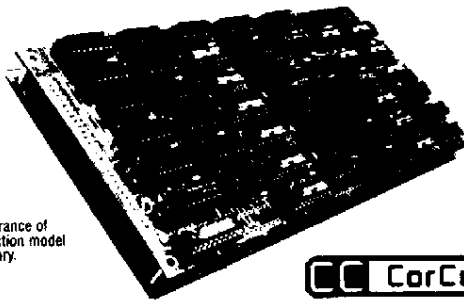
Initialization module
initialize graphics
print title on screen
ask if cassette or disk
input whether cassette or disk
ask if there is a file you want to read in
if there is
ask for file name
read in file
else
return to main module

The rest of the pseudocode for this program would be:

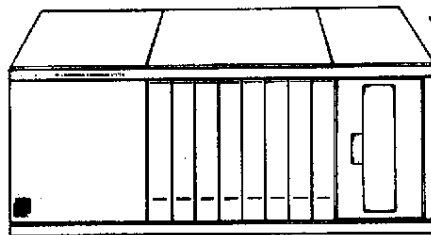
Processing module
prepare the screen for input
accept input into the program
process the data
print the processed data
return to main module
End of job module
should files be saved
if yes, save files
else
ask if you want to process another checkbook
if no end
else
return to main module
(Please turn to Page 26)

TEX-COMP PRESENTS PC Computing Power For Your TI-99/4A!

EXPAND YOUR TI-99/4A HOME COMPUTER WITH CorComp's NEW EXPANSION CARD THE 512K MEMORY PLUS!



Appearance of
production model
may vary.



As Low As
\$169.95
+ S & H
w/ 256K Factory Installed

Now, CorComp, the number 1 name for quality, performance and compatibility in peripherals for the TI-99/4A, has introduced an all new 512K Memory expansion card for the TI Peripheral Expansion Box. This all new card will replace the original 32K expansion card and provides the on-line memory you need for special applications such as, Data Base, RAM Disk and Software development.

Some of the features include:

1. Multi-disk selectability RAM disk capability.
2. External power supply, for retaining 256 or 512K memory when system is shut down.
3. A whole new line of fully compatible software packages to make full use of the power of this exciting product including a Data Base Manager, Word Processor and Spread Sheet.

512K Card for TI P-Box

w/ 256K Factory Installed & Certified*
w/ 512K Factory Installed & Certified

\$169.95
\$229.95

ALSO...

For those of you without TI Expansion Boxes,

THE 512K MEMORY PLUS STAND ALONE UNIT.

This separate unit can be used with both the original TI P-Box and with the CorComp 99 Micro Expansion System. This is a true free-standing memory expansion unit that plugs directly into the computer and incorporates the same features as the 512K Memory Plus Card.

512K Stand Alone for CorComp's 9900 System

w/ 256K Factory Installed & Certified* **\$249.95**
w/ 512K Factory Installed & Certified* **\$269.95**

* Stand Alone Units may be used with CorComp's 9900 System or TI Expansion Box.
* 256K Card and Stand Alone Unit can be factory upgraded to 512K for \$69.95.

SPECIAL BONUS

A **super savings coupon**, to be applied towards the **new CorComp Memory Plus Software Line**, which will **only** be available directly from CorComp.

Send order and make checks payable to:

TEX+COMP

P.O. BOX 33064 - GRANADA HILLS, CA 91344



AUTHORIZED DEALER



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

TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling (\$3.00 Minimum). East of Mississippi 4½%. Add 3% for Credit Card orders. 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 6½% sales tax.

STRUCTURED BASIC PROGRAMMING—

(Continued from Page 24)
 Graphics initialization module
 initialize graphics
 return to initialization module
 Read cassette file module
 read in a cassette file
 return to initialization module
 Read disk file module
 read in a disk file
 return to initialization module
 Prepare screen for input module
 erase all characters from screen, except the title
 return to processing module
 Accept the inputs module
 set up input matrix
 accept the account number
 display transaction number on the screen
 start loop for transactions
 accept the transaction date

if transaction date is not entered, leave loop
 accept the amount
 is it a deposit or check
 accept a comment line about transaction
 calculate new balance
 display new balance on screen
 update the transaction number and display on screen
 go back to loop until max transactions have been entered
 return to processing module
 Calculation Module
 if a deposit
 add amount to balance
 else
 subtract amount from balance
 return to data input module
 Printing module
 ask if output is to screen

or printer
 if screen
 do screen print routine
 else
 do printer routine
 return to processing module
 Screen print routine module
 display 14 records on the screen at a time
 if there are no more records to display
 return to processing module
 Printer routine module
 send output to printer
 return to processing module
 Hchar module
 emulate the DISPLAY AT of Extended BASIC using CALL HCHAR
 return to calling module
 Call key module
 freeze keyboard and wait for input
 (Please turn to Page 28)

SOUTH JERSEY COMPUTERS

P.O. Box 5, National Park, N.J. 08063
 (609) 848-5963

MILLERS GRAPHICS—GRAM KRACKER.....	\$177.50
MILLERS GRAPHICS—ADVANCED DIAGNOSTICS.....	\$15.00
MILLERS GRAPHICS—EXPLORER.....	\$18.25
INSCBOT'S TI ARTIST PLUS EXTRAS.....	\$19.50
MICROPAL'S EXT. BASIC.....	\$59.95
SINGLEMAN MARK III MODEM.....	\$74.00
DATABIOTIC'S 4A/TALK (DISK).....	\$15.95
STAR MICRONICS SG10 120 cps PRINTER.....	\$239.00
6' CABLE (ADD 50 CENTS FOR EACH ADDITIONAL FT).....	\$22.50
CORCOMP MICRO-EXPANSION SYSTEM—COMPLETE.....	\$329.95
CORCOMP RS232 CARD.....	\$92.50

6% SALES TAX FOR N. J. RESIDENTS

ADD \$3.00 POSTAGE AND HANDLING; CANADA \$6.00

(ORDERS OVER \$100.00 ADD \$5.00; CANADA \$10.00)

MASTERCARD, VISA AND AMERICAN EXPRESS ACCEPTED

CREDIT CARD PURCHASE, PLEASE USE THE FORM BELOW OR FACSIMILE

NAME _____
 ADDRESS _____
 CITY _____
 STATE _____ ZIP _____
 CARD # _____
 EXP. DATE _____
 SIGNATURE _____

—ALLOW 6 TO 8 WEEKS DELIVERY—

ALL ITEMS SUBJECT TO AVAILABILITY

MOST ITEMS FROM MARCH'S AD STILL AVAILABLE

**TIRED
 OF TYPING
 THE SAME
 COMMAND
 OVER AND
 OVER?**

**PCKEYS Gives You 12
 Commands, Each Available With 1
 Key Press... In Extended Basic
 Run or Immediate Mode**

Techni-Graphics

**443 Perrie Dr. #302
 Elk Grove Vil., IL 60007**

PROGRAMMABLE CONTROL KEYS

CNTL 1-9
 User redefinable—For commands such as Run, List etc. Up to 140 characters long per key command. Available in command mode.

CNTL 0
 A graphics screen dump any time you want it, whether a program is running or not!

CNTL =
 Catalog disk—Available Anytime—Prints to screen and to printer if specified.

PCKEYS also allows you to change the screen and text colors with one command—In immediate or run modes—great for use with monochrome monitors!

\$22.50

Illinois residents add 7% sales tax

For TI 99/4A only, req. Extended Basic, 32K disk drive and 8 dot addressable, 8 bit printer for screen dump. 100% machine language—Uses no Extended Basic program space.



Tex-Comp Proudly Presents BITMAC



The Revolutionary New 99/4A Graphics Program from Vaughn Software

BITMAC is a comprehensive graphics program for the TI-99/4A computer which allows you to easily place "dots" on the screen in any position and in a choice of 16 colors. You can print text ANYWHERE, even on top of existing text! You can print text sideways, upside down, in mirror image, in 16 colors and a multitude of other ways. But BITMAC text is only a small part of this unique program. Other features of BITMAC will allow you to do things like SIGN your name, make perfect circles ANYWHERE, draw lines from any point of the screen to any other point, make perfect rectangles in EXACTLY the position you want them and much more!

BITMAC has provisions for trackballs, joysticks and even a second computer input! If you have a second computer such as an IBM PC, an Apple Macintosh even an IBM 370 main frame there are provisions for your second computer to create graphics with BITMAC!

BITMAC can make "slide presentations" for group meetings (and print the graphics!), give hours of "just doodling" pleasure, create charts for a stock holder report, print camera ready art for business ads, make still cartoon sequences (and print them in one of two sizes), create mechanical drawings, draft floorplans and many other uses!

BITMAC, with a second computer, can plot satellite data, statistical data, computer generated art plots, analog sampled data and just about anything your second computer can throw at BITMAC.

BITMAC offers BOOLEAN disk input (just like NASA enhances photos!) and a wealth of computer enhancement techniques that lend raw power to your ability to manipulate bitmapped graphics.

BITMAC offers icon input that allows you to point at the functions you want. Nothing was spared in making BITMAC easy and simple to use. Even a child can use it!

BITMAC requires either the Extended Basic, Mini Memory or Editor/Assembler Module, as well as a disk drive system, memory expansion and joysticks or trackball (for precision work).

NOTE: Compatible only with Epson, Star 10X or SG10, or other fully Epson compatible dot matrix printers (the TI-99/4A Impact Printer made by Epson [MX80] requires the upgrade of a GraphTrax or GraphTrax Plus chip set, available from Epson).

Fully compatible with both TI and CorComp Disk Controller Cards.

ONLY \$19.95 + S&H

BONUS: Comes with Free Print Pack & Disk Examples + Sign Maker

Now get more out of your TI Home Computer—for less.

ADD A 2ND DISK DRIVE TO YOUR
TI-99/4A SYSTEM

Stand Alone Disk Memory Drive System

Comes complete with drive, case, power supply & cable. Ready to connect.

By adding a second drive to your system you can free yourself from swapping program and data disks on many programs. You can also make backups without any disk swapping.

These units are sold with a 90-day warranty.

EXTRA VALUE BONUS

With each disk drive ordered we are including a HEAD brand disk drive head cleaning kit which regularly sells for \$15.95.



\$129.95

Plus S&H

NEW SPECIAL OFFER

ADD \$20.00 for DS/DD Drive.

FREE BONUS



VISA AND MASTERCARD
HOLDERS CALL DIRECT
(818) 366-6631

SEND ORDER AND MAKE CHECKS PAYABLE TO:

TEX-COMP™
P.O. BOX 33084 - GRANADA HILLS, CA 91344

TEXAS INSTRUMENTS



AUTHORIZED DEALER

TERMS: All prices F.O.B. 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.

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 8 1/4% sales tax.

SEND \$2.00 FOR NEW 1986 CATALOG WHICH INCLUDES A \$5.00 SAVINGS CERTIFICATE.

Finding that User Note

By HOWARD H. ARNOLD

Ever recall seeing a solution to a pressing problem in a previous issue of MICROpendium User Notes—hence a frantic search through all your back issues?

Seems like it happens to me at least once a week. And finally, once too often! So I dug out Leo Brodie's *Starting Forth*. And here's an application that works and is sure to make using all that great data in previous issues a bunch easier.

The source screens are 75 through 77. Data is stored on screens 78 through 87. A menu, on screen 20, can be called up by typing the word MENU at any time, or can be automatically loaded at startup by redefining MENU on screen 20 and then bsaving the file. Here are the Forth words used in this application and how they work.

ENTER is used for storing data. Just type ENTER followed by a space, then Subject,Category,Month,Date. After a data entry session, be sure to type FLUSH to be sure the data really gets stored on disk.

FIND permits locating any record with a search on any field. The fields used in this data base are named SUBJ, CAT, MONTH and YEAR. So to find an entry for June, for example, type FIND MONTH JUN. The first item on the data base will appear on the screen.

(Please turn to Page 30)

STRUCTURE—

(Continued from Page 26)

return to calling module
Write to cassette or disk module
if cassette save file on
cassette
else
save file on disk

Having gone this far, you are now ready to begin writing the actual program in TI BASIC. This however, we'll leave until next month.

```
SCR #3
0 ( WELCOME SCREEN ) 0 0 GOTOXY ." BOOTING..." CR
1 BASE->R HEX 10 B3C2 C! ( QUIT OFF! )
2 DECIMAL 21 BLOAD MENU
3
4
5
6
7 R->BASE
8
9
10
11
12
13
14
15

SCR #20
0 ( CONDITIONAL LOAD )
1 MICROpendium User Note Index:
2
3 To FIND, type FIND SUBJ xxxxxxxx or
4 FIND MONTH xxx etc.
5 then ANOTHER or ALL
6
7 To ENTER DATA, type ENTER SUBJ,CAT,
8 MONTH,YR
9
10 DOSORT sorts alphabetically by SUBJ
11
12 .PLIST prints all data to printer
13
14 MENU gets this screen
15

SCR #75
0 ( SIMPLE FILES ) : TEXT PAD 72 BLANKS PAD HERE - 1- DUP ALLOT
1 MINUS SWAP WORD ALLOT ; : '[COMPILED]' ; : MOVE 2 / MOVE ;
2 : 2@ >R R 2+ @ R> @ ; : 2DUP OVER OVER ; : NOT 0= ;
3 : -TEXT 2DUP + SWAP DO DROP 2+ DUP 2- @ 1 @ - DUP IF DUP
4 ABS / LEAVE THEN 2 +LOOP SWAP DROP ;
5 : ARRAY <BUILDS , , DOES> ;
6 14 0 ARRAY SUBJ 12 14 ARRAY CAT
7 4 26 ARRAY MONTH 2 30 ARRAY YEAR
8 32 CONSTANT R-LENGTH 1024 R-LENGTH / CONSTANT REC/BLK
9 78 CONSTANT FILES 10 REC/BLK * CONSTANT MAXRECS
10 0 VARIABLE #RECORD 0 VARIABLE KIND
11 : WHAT ( -- ADR ) PAD 80 + ;
12 : RECORD ( -- FIRST ADR OF CURRENT RECORD )
13 #RECORD @ REC/BLK /MOD FILES + BLOCK SWAP R-LENGTH * + ;
14 : FIELD ( FIELD --ADR LENGTH) 2@ RECORD + SWAP ;
15 : .FIELD ( FIELD ) FIELD -TRAILING TYPE SPACE ; --->

SCR #76
0 ( SIMPLE FILES CONT'D ) 1 VARIABLE SWFG 0 VARIABLE TEMP 84 ALLOT
1 : TOP 0 #RECORD ! ; : DOWN 1 #RECORD + ! ;
2 : .SUBJ SUBJ .FIELD ;
3 : READ 44 TEXT ;
4 : PUT ( FIELD ) READ PAD SWAP FIELD MOVE UPDATE ;
5 : KEEP ( FIELD ) DUP KIND !
6 2+ @ READ PAD WHAT ROT MOVE ;
7 : FREE 1 MAXRECS 0 DO 1 #RECORD ! RECORD C@
8 ( ASCII) 33 < IF NOT LEAVE THEN LOOP ;
9 : -FIND ( -- F ) 1 KIND @ MAXRECS #RECORD @ DO 1 #RECORD ! DUP
10 FIELD WHAT -TEXT NOT IF SWAP NOT SWAP LEAVE THEN LOOP DROP ;
11 : SWITCH RECORD DUP -1 #RECORD + ! RECORD DUP TEMP #RECORD @ ,
12 R-LENGTH MOVE R-LENGTH MOVE TEMP SWAP R-LENGTH MOVE
13 1 SWFG ! UPDATE ; : MISSING ." NOT IN FILE " ;
14 : SORT FREE #RECORD @ 1- 0 DO 1 #RECORD ! RECORD SUBJ 2 + @ 1
15 #RECORD + ! RECORD -TEXT 0 > IF SWITCH ENDIF LOOP ; --->
```

(Please turn to Page 30)

INTERN[®] TI 99/4A ROM and GROM Listings w/ Commentary by H. Martin plus GPL Directions

THIS BOOK IS THE KEY! INTERN ("Inside") the TI 99/4A reveals the hidden secrets of the 4A. Essential for owners, enthusiasts, programmers, developers or anyone who wants in-depth understanding of how the TI 99/4A works.

Over 200 pages of complete disassembled internal code found in the 4A console. ROM and GROM listings are fully commented with GPL directions explains how the entire operating system functions — including the GPL interpreter. Hidden tricks and tips are discussed along with the commands, format, opcodes and uses of Graphics Programming Language used in the computer.

Starting with the console ROM: address >0000 to >1FFF, this book gives you a detailed look at every secret. Interrupt routines, power-up functions, system Monitor, cassette routines, Basic and Extended Basic interaction and various utility routines. GROM 0, 1 and 2 are also listed and commented in detailed descriptions.

If you've ever wondered why your TI 99/4A acts as it does, what the tricks and hidden features are, where the "blank" spaces exist, why Texas Instruments kept all this information a secret: well, this is your chance!

Order now! Only \$17.95 (US) Cheque, Money Order or COD. Add \$1.00 via Ground \$3.00 via Air \$5.00 shipping overseas.

GPL Assembler V2.1

UNLOCK ALL THE SECRETS! New GPL Assembler Version 2.1 available exclusively through RYTE Data.

This program provides the power to write, edit and assemble true GPL programs for the TI 99/4A. Create code that accesses console operating system routines directly. Develop programs that use the GPL interpreter and all the features of the TI 99/4A.

One of TI's major secrets was the GPL interpreter contained on GROM chips in the 99/4A console. This internal code, "Monitor" and the operating system, was never documented. Many of TI's routines, programs, languages and command modules are written in this "Graphics Programming Language."

NOW THIS 'HIDDEN CODE' IS REVEALED IN FULL!

It is now possible to write your own 'modules' or update GPL modules (with the new hardware devices such as Maximem and GramKracker which are now available), modify disk based programs written in GPL and create working GPL programs such as Myarc's new Disk Manager III program. You can even modify the TI 99/4A operating system! New hardware devices will be available to take full advantage of this important software package.

This package includes the GPL Assembler disk, printed documentation, GPL tips and hints, update support service and commented GROM/ROM listings (with the book "INTERN"). An example for a command module type GPL program is included with source, object and list files on disk.

Requires: 32k memory, disk drive(s), TI Editor Assembler package. Printer/RS-232 recommended. Price: \$59.95

Package w/ INTERN \$75.00 (US)

Add \$3 S & I.

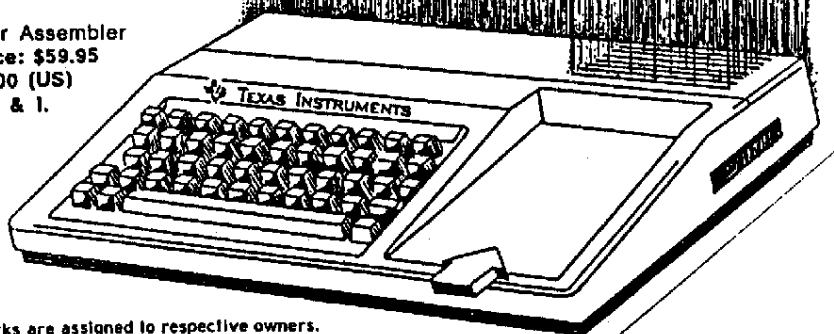
**Ryte
Data.....**

210 MOUNTAIN STREET,
HALIBURTON, ONTARIO K0M 1S0

(705) 457-2774

All trademarks are assigned to respective owners.

**INSIDE the
TI
Operating
System**



FINDING USER NOTE—

(Continued from Page 28)

ANOTHER finds the next record meeting the specification you last searched for (or notifies you "no more").

ALL displays all records meeting the search specification.

CHANGE permits changing an entry. First FIND the entry to be changed, then type CHANGE followed by a space, then the name of the field (for example CAT) to be changed, then the new entry for that field. Be sure to FLUSH if you want the change to be permanently entered on the disk.

DOSORT sorts all records alphabetically by subject.

.PLIST prints a complete alphabetical index by subject.

PURGE destroys all records. Be careful of this one!

The program as listed will permit you to enter the data from all your back issues. I changed the definition of MENU to: MENU CLS 272 257 DO MESSAGE CR LOOP ;. Then after loading all the utility screens I felt I'd ever need I saved the system with the following sequence; ' TASK 21 BSAVE.

Adding the command 21 BLOAD to screen 3 and putting the prompts I wanted on screen 20 (my listing of both screen 3 and screen 20 are shown here) completes the job.

I also changed the name of the Forth program on the application disk to INDEX. This makes the load sequence from Editor/Assembler Option 3: DSK1.INDEX. Each month's entries will take only a few minutes to add to your file, and you can then find—literally in seconds—any User Note you may recall from yore!

Note: If you want to avoid the typing, a Freeware disk is available from the author. This disk includes the Forth system, the binary application code, source screens (75-77) and a complete User Note Index from August 1984 through February 1986. Send \$5 for disk, postage and handling to Howard H. Arnold, 210 Beech Valley Rd., Lewisville NC 27023.

(Continued from Page 28)

```

SER #77
0 ( SIMPLE FILES / END USER WORDS)
1 72 LOAD
2 : ENTER FREE SUBJ PUT CAT PUT
3 MONTH PUT YEAR PUT ;
4 : REMOVE RECORD R-LENGTH 32 FILL UPDATE ;
5 : CHANGE " PUT ;
6 : .DATA SUBJ .FIELD CAT .FIELD MONTH .FIELD YEAR .FIELD ;
7 : FIND " KEEP TOP -FIND CR IF MISSING ELSE .DATA THEN ;
8 : GET " .FIELD ;
9 : PURGE MAXRECS 0 DO 1-#RECORD ! REMOVE LOOP ;
10 : ANOTHER DOWN -FIND IF " NO OTHER " ELSE .DATA THEN ;
11 : ALL TOP BEGIN CR -FIND NOT WHILE .DATA DOWN REPEAT ;
12 : .PLIST SWCH MAXRECS 0 DO 1-#RECORD ! .DATA LOOP UNSWCH ;
13 : DOSORT BEGIN SWFG @ IF 0 SWFG ! SORT ENDIF SWFG @ NOT UNTIL
14 1 SWFG ! ;
15

```

USER NOTE INDEX

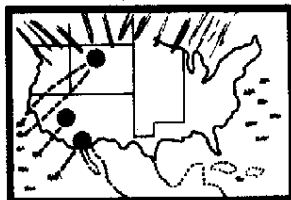
40-COL XB NOV 85	BBS HANGUP OCT 84
AMORT LOANS OCT 85	BLIND UG SEP 84
BASIC TIMING TEST FEB 86	BLIND WORD PROC SEP 84
BASIC PROG VARIABLE FEB 86	BUFFER UNLIMITED JUL 85
BASIC CONV TO XB FEB 86	CALC STAND RADIO SHACK JUL 85
BASIC CIRCLE DEC 85	CASSETTE LOAD VOLT JUN 85
BASIC CONV FM ATAR DEC 85	CASSETTE TIME SAVE MAY 85
BASIC LINE CENTER SEP 85	CASSETTE ESCAPE MAR 85
BASIC GEMINI SETUP AUG 85	CASSETTE TIME/SAV FEB 85
BASIC LOWER CASE AUG 85	CASSETTE VOICE ID OCT 84
BASIC BORDER JUN 85	CASSETTE MEM/SAV AUG 84
BASIC BAR-CHART JUN 85	CONNECTOR GROM OCT 85
BASIC WORD WRAP MAY 85	CONNECTORS GROM FEB 85
BASIC U/C ALIGN APR 85	CONTEST SCORE/KPR AUG 84
BASIC EXTRA/RAM MAR 85	CURSOR CREDIT NOV 84
BASIC CHAR/DEF MAR 85	CURSOR SHAPE OCT 84
BASIC SCREEN/DUMP FEB 85	D/V80 FILES READ OR PRIN FEB 86
BASIC TRACE FEB 85	DBM NAVARONE MAN MAY 85
BASIC TYPING/TUT FEB 85	DBM PERS REC KPG OCT 84
BASIC DESCENDERS JAN 86	DEC/BIN CONVERTER JUL 85
BASIC SPACE/SAV JAN 86	DISK DRIVE SPEED FEB 86
BASIC M/M-E/A DEC 84	DISK SWEEP ALL FI FEB 86
BASIC COLOR/NUM DEC 84	DISK SPACE MAR 85
BASIC EDITING DEC 84	DISK LABELS JAN 85
BASIC PROG/XFR DEC 84	DISK SALVAGE DEC 84
BASIC LOWER/CASE NOV 84	DISK EDGE-CONN DEC 84
BASIC SCRIN FREEZE OCT 84	DISK VOLTAGE REG NOV 84
BASIC SCRIN CLEAR OCT 84	DV/80 CONV TO PRGM DEC 85
BASIC MEM/SAV SEP 84	FANS COOLING AUG 85
BASIC NUMB ROUND SEP 84	FANS COOLING MAY 85
BASIC POSTAL RATES SEP 84	FORTH RESTART MAR 85
BASIC DEBUG AID AUG 84	FORTH DOUBLE/SIDE FEB 85
BASIC COLOR AUG 84	FORTH NAT/INFO ADD FEB 85
BBS BAY CITY MAY 85	FORTH NATIONAL INF NOV 84
BBS DOWNEAST MAR 85	(Please turn to Page 32)
BBS MIDSOUTH MAR 85	
BBS SOUTHCAL MAR 85	

FROM ENGLAND!!

THREE SUPERB GAMES

UNTIL NOW, ENGLAND HASN'T MADE ITS MARK IN SOFTWARE DEVELOPMENT. NOW ARCADE HARDWARE HAS ACQUIRED THE RIGHTS TO PRODUCE THE THREE GAMES DEVELOPED BY THE GIANT THORN-EMI AND WHAT GAMES!!!! all in 100% code

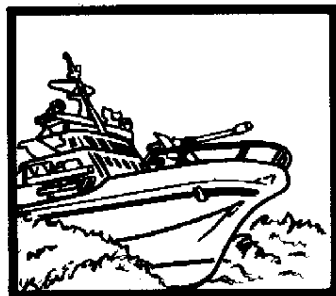
COMPUTER WAR



Based on the film "WAR GAMES" this game became a best seller for the Commodore and Atari computers. Defend the U.S.A. from missiles as a computer goes wild. Two scenes, Track enemy on a giant map

then as you target them, fly a fighter to shoot them down in air to air combat. Then crack the code in a limited time scale. One of the best games ever written!

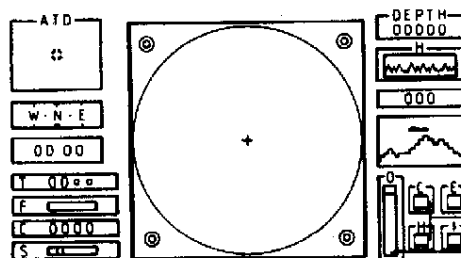
RIVER RESCUE



Navigate a treacherous river and save the refugees! A vicious and bloody war is raging on the north bank of a river swarming with giant electric eels and fearsome crocodiles. Thousands of innocent villagers,

made homeless by the battles, are trapped between the treacherous river and the violent conflict. They are starving and helpless. Generously, a friendly country on the south bank of the river has offered food and shelter to the refugees. It is your mission to rescue them in your powerful patrol boat and take them across the river to safety. Although your intentions are peaceful, the warring armies each think you are working for the other one — so watch out for attacks from their helicopters and tanks. With danger all around you, you need nerves of steel to survive this tough mission of mercy!

SUBMARINE COMMANDER



A submarine patrol simulator to hunt and destroy enemy shipping. Your mission is to destroy enemy shipping in Mediterranean waters. You have sonar to help you find them when you are submerged. If you are attacked you can dive deep (not too deep or the hull will crack) and try to dodge the depth-charges; then you can rise to periscope level for another attack on the convoy. But check the instruments for your oxygen level, fuel, battery charge, depth under your keel, and watch out for enemy destroyers, or it may all end in disaster!

HOW TO ORDER

Three games on one disc costs £35.00 NOT \$.

Send Money order/bank draft made payable to ARCADE HARDWARE to address below.

OR give written instructions to debit MASTERCARD by £35.00. Quote card number, name on card and expiry date. Mastercard orders also taken by phone between 7 a.m. and 6 p.m. E.S.T.

NO OTHER CREDIT CARDS ACCEPTED.

SEND TO ARCADE HARDWARE
211 HORTON ROAD, FALLOWFIELD, MANCHESTER, M14 7QE
ENGLAND. Tel: 011 44 61 225 2248

Games require 32k RAM, Disc Control + drive, + any of Ed/Ass, Mini-Memory, ExBas, TI-Writer.

DIJIT Systems has RGB conversion

DIJIT Systems introduced its RGB Conversion for the TI99/4A at the recent TI Fest-West in Los Angeles.

With the conversion, according to the manufacturer, the user is able to read Forth screens in the 64-column editor mode.

The conversion consists of the Model 4A Video Decoder Interface, which converts the output signals to red, green and blue video, and the RGB Conversion Kit, an internal hardware modification to the console.

The manufacturer describes the kit, which requires some soldering, as easy to install. The export version of the TI99/4A, conforming to PAL specifications, does not require the RGB Conversion Kit, only the Model 4A Video Decoder Interface.

Thomas F. Spillane of DIJIT Systems says the company also has a kit for adapting the Sears 4084 to the linear (analog) input necessary to display the shades of color generated by the TI99/4A.

"Our present version is compatible with the Zenith ZVM 135, Taxan 420 and the modified 4084," he notes. "In the works is a version for the Sony KV 1311CR, Amiga 1080, Atari SC 1224 and RS-170A specification monitors such as Amdek IV A, Panasonic DT-M140 and others."

He notes that the conversion cannot be used with composite monitors.

"They are basically TV sets without tuners and have neither a sufficient number of screen pixels nor video amplifier bandwidth to pass high

resolution computer video, without which RGB is pointless," Spillane says.

He says that digital RGB or RGBI monitors conforming to IBM PC or Apple protocol will not display the shades of color generated internally by the TI99/4A. A linear (analog) monitor is required.

He says the conversion is completely software compatible, but will not allow 80 columns of text. The TI VDP has 32 horizontal screen positions which in Text mode displays 40 characters.

Spillane says the conversion minimizes the eyestrain associated with the use of videodisplay terminals.

The console modification kit sells for \$35 and the interface adaptor for (Please turn to Page 34)

USER NOTE INDEX—

(Continued from Page 30)

FREWARE MICRO DEC 84
FREWARE SUPER BUGGER NOV 84
GAME INSANITY NOV 85
GAMES PARSEC MAR 85
GAMES PARSEC JAN 85
GAMES BEANSTALK SEP 84
GRAPHX DELAYS OCT 85
HEAT RADIO-SHACK MAR 85
HEAT SINKS DEBUNK JUL 85
INITIALIZED REPAIR JUN 85
INSURANCE INFO NOV 84
JOYSTICK TEST PROG AUG 85
JOYSTICK TESTER JUN 85
LONG LINES PRINTING SEP 85
MAGAZINE BIBLIOG MAY 85
MAIL SPEC/HANDL NOV 84
MEM/EXP FOUNDATION FEB 85
MEM/EXP 128K&TEII JAN 85
MODEM ANCHOR XII SEP 84
MULTI-PLAN PRINT CONT SEP 85
MULTI-PLAN DEFAULTS JUN 85
MULTI-PLAN DEFAULTS APR 85
MULTI-PLAN COLOR CHG MAR 85
MULTI-PLAN PRINTER SET MAR 85
MULTI-PLAN FREWARE ERR JAN 85

MUSIC PIANO DEC 85
MUSIC DEMO NOV 84
NUMBERS CONV TO WORD JAN 86
NUMBERS CONV/SPCH OCT 85
REPAIR CHARGES OCT 84
SBUG XB JAN 85
SCREEN/SAV ASSY LAN MAY 85
SCROLL HORIZ ASSY APR 85
SINGAPORE TI-USERS MAY 85
SORT QUICK JUL 85
SOUND WEIRD FEB 86
SOUND BAS-XB JUN 85
SOUND STRANGE FEB 85
SOUND SYMPHONY? DEC 84
SOUND BASIC DEC 84
SOUND EFFECTS OCT 84
STATIC DOWNEY AUG 85
TE CR REMOVE OCT 84
TE PRINT COMM SEP 84
TE FILE CONV AUG 84
THOMSON SOFT NEW ADDR OCT 85
TI-WRITER FILE SAMPLER JAN 86
TI-WRITER SUMMING JAN 86
TI-WRITER MULTI-COLUMN JAN 86
TI-WRITER FILE/PRINT OCT 85

TI-WRITER FORM-FEED AUG 85
TI-WRITER COLOR DEF JUN 85
TI-WRITER FORTH CHGES APR 85
TI-WRITER SPELL/CHK MAR 85
TI-WRITER C/R FEB 85
TI-WRITER PIO DEFAULTS OCT 84
TI-WRITER CNT/U CORR SEP
TINY/CAL PROG CORR DEC 85
TIPS PEEKS-POKES APR 85
TK-WRITER SD BOMB OCT 85
TK-WRITER CC LOAD JUN 85
UNDERLINE REDEFINITION NOV 84
XB SUBROUTINE DEC 85
XB ACCEPT NOV 85
XB CURSOR DEF NOV 85
XB JOYSTICK LDR NOV 85
XB SCREEN COLOR NOV 85
XB SCROLL SEP 85
XB ACCEPT SEP 85
XB RUN TEXT SEP 85
XB ACCEPT AUG 85
XB SPEEDUP MAY 85
XB PROG/RECOV MAR 85
XB SPRITE MOTIO DEC 84
XB REENTRY NOV 84
XB SPEECH NOV 84
XB AUTOLOAD OCT 84

TEX+COMP™

America's Number One TI computer retailer

SPECIAL**OUTSTANDING ARCADE QUALITY GAMES
for the TI-99/4A****MIDNIGHT MASON****MICRO PINBALL II**

DISK ONLY

MIDNIGHT MASON**THE TI-99/4A ANSWER TO GHOST CHASERS**

A delightful chase through a maze of ladders and brick walls as you direct your mason in collecting his tools. Entertaining animation as the mason climbs, runs, builds, and breaks through brick walls in his attempt to avoid being devoured by not so friendly ghosts. Great arm flexing, big punting, pick swinging action. You will play for hours. Requires Extended Basic, 32K and disk drive. \$14.95 + S&H

MICRO PINBALL II

Turn your 99/4A into a fast action pinball machine, complete with keyboard operated "flippers" and ball control, absolutely incredible color graphics and performance. \$14.95 + S&H

SPECIAL BONUS: MIDNIGHT MASON and MICRO PINBALL II plus 2 additional high-speed arcade games: TI TOAD and BURGER BUILDER. Requires Extended Basic and 32K.

ALL 4 ONLY \$19.95 Plus S&H

all programs load automatically with Extended Basic

TEX+COMP proudly presents
the most outstanding arcade game ever written
for the TI-99/4A.

Championship Tennis lets you enjoy the excitement, action and thrills of a professional tennis match with complete control.

The graphic displays are all in dimensional perspective, which adds increased realism.

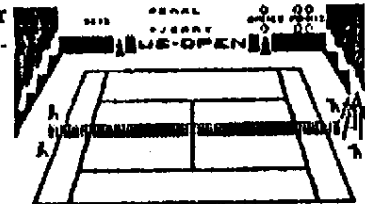
Thousands of this program have been sold throughout the world for other computers. Now, you can enjoy the ultimate action arcade game on your TI-99/4A. Requires Extended Basic

and 32K.

ONLY \$9.95 Plus S&H

COMPLETE WITH DOCUMENTATION

Now with XBasic
Auto-Load

TENNIS

© 1983 NICEWARE

ALSO INCLUDED:

A collection of bonus, unreleased TI arcade games are included. They may not be complete or documented, but you'll certainly have a ball with them!

 add 3% for credit card orders	VISA and MASTERCARD HOLDERS CALL DIRECT (818) 366-6631 24 Hour Order Line	SEND ORDER AND MAKE CHECKS PAYABLE TO: TEX+COMP™ P.O. BOX 13004 - GRANADA HILLS, CA 91304 AUTHORIZED DEALER
TERMS: All prices F.O.B. Los Angeles. For fastest service use cashless 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). 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. Confirmed orders add 5% sales tax.		
"The Leader of the Pack!"		

SEND \$2.00 FOR NEW 1986 CATALOG WHICH INCLUDES A \$5.00 SAVINGS CERTIFICATE.

Freeware update

DISK MANAGER 99

This resident disk manager utility is offered by Mike Dodd, 116 Richards Dr., Oliver Springs, TN 37840. It is loaded from X BASIC and stays in memory at all times. It will change file protection, rename a file, catalog a disk to screen or printer, rename a disk, test a disk and initialize a disk, all from command mode with a CALL LINK without destroying the program in memory. Requires disk, 32K and either Extended BASIC, Mini-Memory or Editor/Assembler. Send a disk, return mailer and postage. The author asks a donation if you find the program useful.

PROGRAMS FROM ALABAMA

John E. Taylor of 2170 Estaline Dr., Florence AL 35630, is offering several programs.

His Public Domain #1 consists of BASIC and Extended BASIC programs once sold commercially. On the disk are:

—Color Master, a color code breaking game for one or two players who try to figure out the four colors coded in sequence from a total of seven available colors. X BASIC required, speech synthesizer optional, color TV or monitor recommended.

—Peter Cottontail's Egg Hunt, in which two rabbits try to be the first to find a magical egg hidden in a graphical maze. Uses graphics, animation and music. X BASIC required.

—Capture the Intruder, a strategy game using extensive graphics and speech. Console BASIC only, TEII and speech synthesizer optional.

—Silent Night, two versions of the music, with manger scene and falling snow. X BASIC required.

RGB—

(Continued from Page 32)

\$65. Spillane says prices for interface adaptors under development may vary, depending on connections required.

For further information, contact DI-JIT Systems, 4345 Hortensia St., San Diego, CA 92103 or (619) 295-3301.

—Spelling Builder and Program builds spelling lists with both grammatic and phonetic spellings. Tests with voice only and/or with word flash. TI Text-to-Speech programs, X BASIC, 32K, disk drive and speech synthesizer required.

—Alphanum Delight—Letter and number recognition game, which author used to teach his 1 1/2-year-old son. Both a 16K and a 32K disk only version (which includes a lower-case letter option) are included. X BASIC required, speech synthesizer optional.

—Out on a Limb is a "hangman"-type word guessing game for one or two players, in which successful guessing gets a monkey a banana feast while losing causes him to fall into a pond. A pre-built word list is supplied as well as a separate file building program which lets the user create word lists. X BASIC required, speech synthesizer optional.

Taylor offers Sprite Builder Version 4, a graphic design aid program which allows the user to create double-sized sprites. It is an Extended BASIC program with some machine language routines. It requires Extended BASIC, 32K and disk drive. Documented source code is included. Version 2, without the machine language routines, is included; this version can be run on a 16K cassette-based system. More than 115 predefined sprite pattern files are included.

Checkbook and Budget Manager, which allows up to 99 user-defined categories, will store between 100 and 400 records per month, depending on the type of disk drives used. The programs were written in X BASIC. At least one disk drive, 32K memory and X BASIC are required. Printed reports require a Star Micronics Gemini 10X type printer. However, a printer control code sheet is provided to assist users to adapt the program to other printers.

The MS-Adventure Series is made up of the MS-Adventure program and three MS-Adventure databases, "The Search for Murgan's Keep," "The Enchanted Keep" and "The New King." Written in assembly language, the MS-

Adventure Series requires X BASIC, 32K and a disk drive.

For the Public Domain Disk or Sprite Builder, users may send \$5 for the DS/SD version or \$7.50 for the SS/SD version, or they can send one DS/SD or two SS/SD initialized disk(s), return mailer and postage.

For Checkbook and Budget Manager or the MS-Adventure Series, users may send \$5 or one initialized DS/SD or SS/SD initialized disk, return mailer and postage.

VALWRITE

This program enables use of the Personal Record Keeping cartridge to create a mailing list that can then be used with TI-Writer. Send disk, mailer with return postage and \$2.50, or send \$5 and disk, mailer and postage will be provided, to Stephen J. Tuorto, 18-Chimney Lane, Bayshore, NY 11706.

TI-REWRITE

This rewrite of the TI-Writer manual resulted from the author's month's of trying to learn TI-Writer "without much knowledge of programming in any language." He suggests that the program be loaded into the computer using the TI-Writer and disk, so that the user can see the commands as they are used.

Send disk, mailer and postage to Dick Altman, 1053 Shrader St., San Francisco, CA 94117.

FAS-Tran

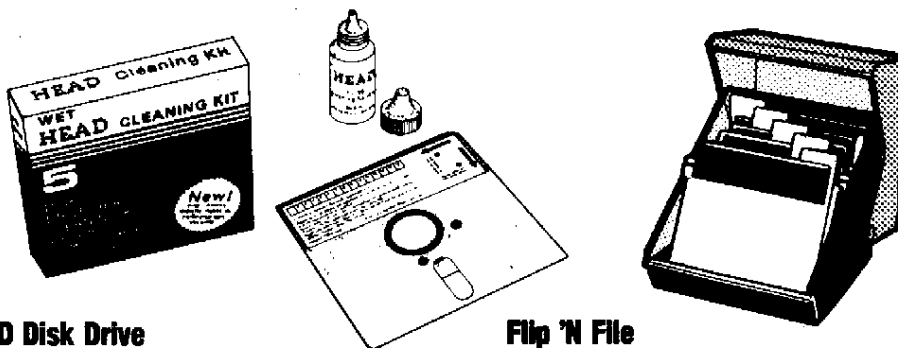
This program for checkbook category totals to spreadsheet planning allows the user to get totals of all amounts in up to 99 customizable categories. Checkbook can be recapped at intervals to give the user totals for all to date. A net pay explosion technique allows automatic entry of recurring amounts.

Different types of listings of all checks in the "file" include a printout/display/D/V80 file of the total amount on each category in that "file" for all checks/transactions. Totals can be saved in SYLK format to load into a Multiplan spreadsheet.

The program's spreadsheet-type op-
(Please turn to Page 36)

TEX-COMP PRESENTS BACK BY POPULAR DEMAND For Disk Users

10 **FREE** premium-grade certified Disks
When you buy the **HEAD Disk Drive Cleaning Kit** (Reg. \$15.95)
and the genuine **Flip-N-File/50 Disk Storage Case** (Reg. \$14.95)
at the **SPECIAL COMBINED PACKAGE PRICE**
of only **\$19.95** plus S&H (a \$45.00 Value).



HEAD Disk Drive Cleaning Kit

The HEAD Disk Drive Cleaning Kit removes debris from your disk drives without abrasion and without disassembly. Recommended for use at least once a week. It removes oxide deposits, smoke particles, and skin oils which "ALL CAN CAUSE LOST DATA AND DISK ERRORS." The cleaning disk inserts like a regular disk and comes complete with cleaning disks and TI approved cleaning solution.

Flip 'N File for 5 1/4" Mini Disks

Protect floppies from dust and other contaminants. Keep your valuable disks safe with the original Flip 'N File Disk Storage Case. This is the original—not a cheap imitation made of substandard materials. Holds 50-70 disks. Comes complete with dividers and index tabs. Built-in carrying handle and hinged cover make this unit the best buy on the market. TEX-COMP has sold these units for over five years with total consumer satisfaction.

TEX-COMP has made a special truckload purchase of premium-grade certified diskettes that were purchased by leading computer and software firms, including TI and Atari for commercial software. All disks come with hub protectors and a Tyvek sleeve. Since they were for software duplication they are 100% tested and certified. In fact, some may already be formatted and contain programs which can, of course, be written over.

While officially designated SS/DD, the ones we randomly tested are 100% error free when used as DS/DD.

Send order and make checks payable to:

TEX-COMP

P.O. BOX 33064—GRANADA HILLS, CA 91344



AUTHORIZED DEALER

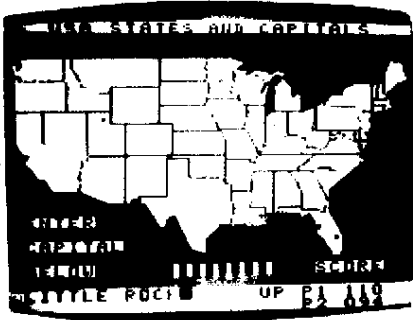


VISA and MASTERCARD
HOLDERS CALL DIRECT
(818) 366-6631
24 Hour Order Line

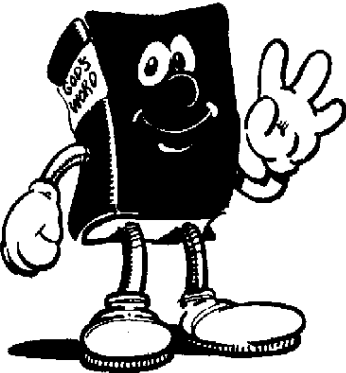
TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling (\$3.00 Minimum). East of Mississippi 4 1/2%. Add 3% for Credit Card orders. Prices and availability subject to change without notice. We reserve the right to limit quantities.

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 1/2% sales tax.

TI-99/4A SOFTWARE



USA STATES & CAPITALS
HI-RES MAP, STATES, CAPS
NICKNAMES, POSTAL ABBRS.



BIBLE BOOKS GAME
66 OT/NT BOOKS, HUNDREDS
OF CLUES, 9 SKILL LEVELS

BOTH GAMES INCLUDE:
1-2 PLYRS. INSTRUCTION &
TUTOR SCREENS, SOUND FXs
HI-RES GRAPHICS & COLORS
REQUIRE NO EXTRAS TO RUN

PLEASE SEND PAYMENT OR INQUIRY TO:

TRINITY SYSTEMS
1022 GRANDVIEW AVENUE
PITTSBURGH, PA 15237

- USA STATES & CAPS TAPE \$16.95
- BIBLE BOOKS GAME TAPE \$19.95
- BOTH GAMES on ONE TAPE \$27.95

Name _____

Address _____

City State/Zip _____

Transferring your text files

By **BOB BUSS**

This article is meant to help those who want to transfer text files to mainframe computers, or just to reduce their time on systems like The Source and Compuserve.

The Texas Instruments Terminal Emulator II's "Transfer" command is a very good file transfer procedure that implements a protocol for error checking. The only problem is that it will only work with systems that have software specifically designed to interface with it.

However, there is another, more universal, way, with the use of TI-Writer. Although this method does not have a protocol for error checking, its transfer errors are very low if not nonexistent.

The procedure goes like this:

First, log on to your mainframe system and enter the edit mode for a file. When the mainframe system is ready for you to enter text, you remove the TE-II cartridge. The communications link to your mainframe computer will be held up by your RS232 card.

Next, insert your TI-Writer cartridge into your TI99/4A GROM port and select the Text Formatter option.

Next, you enter the Text Formatter

information. The file name will be that of the text file you wish to transmit, the Print Devicename will be "RS232.CR". Use the default setting for the rest of the options.

After TI-Writer has completed printing the file to your mainframe, remove the TI-Writer cartridge and replace with the TE-II cartridge. At this time you will want to close your file on the main frame.

An example of using this upload technique is in sending mail on The Source. Sometimes it can take forever to send mail on The Source if you have to edit and re-edit a long piece of text. The procedure that follows will save you a little time in this area:

First, log on to The Source and enter the mail function. When the Source states, "Enter text," you remove the TE-II cartridge and replace it with the TI-Writer cartridge, and follow the file transfer method outlined above. After the file has been transferred, replace TI-Writer with TE-II and type ".DI" to review the message and make sure the transmission went OK. Then you close the file by typing ".s" to send the mail. This will allow you to edit your messages when you are off-line and not being charged the connect time.

FREWARE UPDATE—

(Continued from Page 34)

tion allows monthly totals of transactions by category into a 12 month matrix/file which will give totals for all months, year-to-date actual, year-to-date budge, annual total and current month/year-to-date variances to budget. Totals are recalculated when an amount is entered. Limits are 350 transactions for the assembly language, RAM sort of transactions or 3,600 for the disk sort of transactions, and 99 categories.

Requires XBASIC, memory expansion and one disk drive. Printer recommended. Specify two single sided disks or one double-sided disks. Send disk(s) or \$2 and return postage to Bill (Please turn to Page 43)

PROGRAMMERS!

Like to make some money?
Like to see your program receive
wide circulation?

Join the leader in useful programs. If you have a high quality, useful program, we will market it for you to our world wide customer base and PAY you royalties! Saving you all the hassles of promotion, production, fulfillment, & customer support.

Contact Larry Hughes

QUALITY 99 SOFTWARE
1884 Columbia Rd #1021
Washington DC 20009
(202) 667-3574



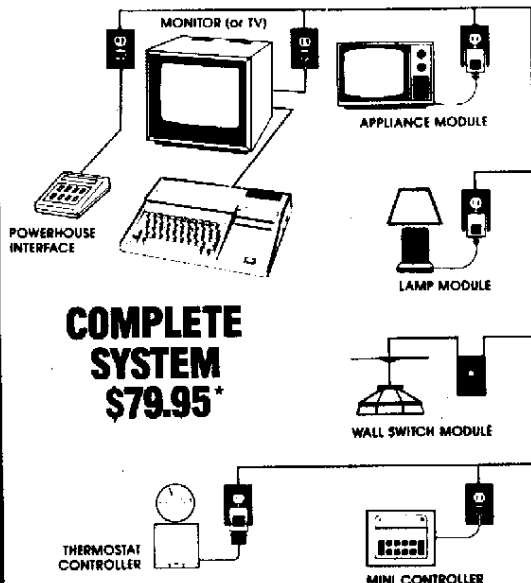
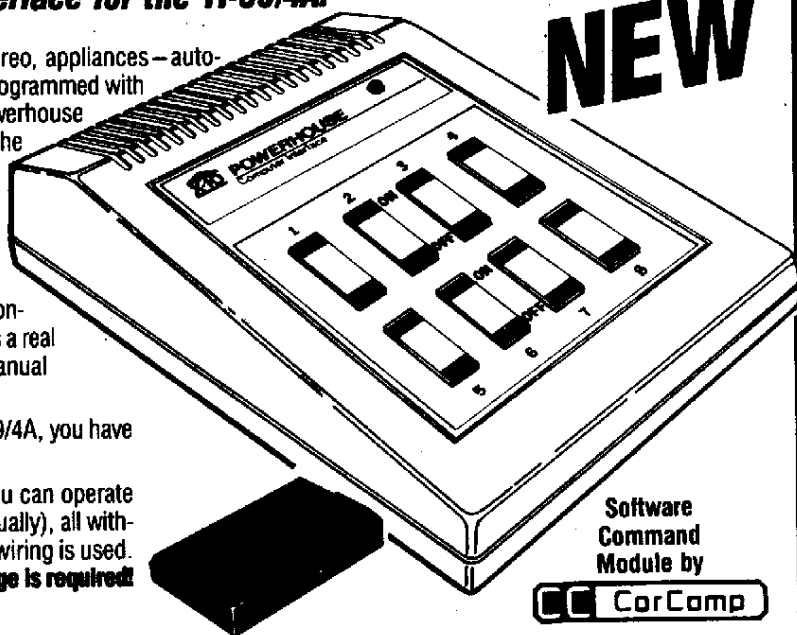
KEEP YOUR HOME AND FAMILY SAFE AND SECURE WITH THE X-10[®] POWERHOUSE[™]

Computer Interface for the TI-99/4A!

Now, turn your lights on or off, your TV, stereo, appliances—automatically, by remote control that has been programmed with your TI-99/4A. Just connect the new X-10 Powerhouse controller/interface to your 99/4A console with the special TI cable. The controller can then be programmed using the CorComp X-10 software module to operate the X-10 modules at any predetermined time sequence or schedule. The X-10 Powerhouse can then be disconnected from your computer and used as a stand alone controller for your entire home or business. It contains a real time clock, a battery backup and 8 separate manual controls.

With the X-10 Powerhouse system and your TI-99/4A, you have complete control!

Once your X-10 Powerhouse is programmed, you can operate your lights and appliances automatically (or manually), all without any special wiring since only existing home wiring is used. **No memory expansion or disk or cassette storage is required!**



**COMPLETE
SYSTEM
\$79.95***

1. POWERHOUSE CONTROL SYSTEM for the TI-99/4A including the X-10 Powerhouse interface/controller, a special TI-99/4A connecting cable, and CorComp X-10 software module. **\$79.95.***

2. APPLIANCE MODULE. Turn your appliance on or off. Just plug into any wall outlet. Responds to a signal through your electrical wiring from the X-10 Powerhouse. AM 286 **\$13.95.**

3. LAMP MODULE. Lets you turn on-or off-or dim-or brighten any incandescent lamp you connect it to. Plugs into any wall outlet and is actuated automatically or manually with your X-10 Powerhouse. LM 511 **\$13.95.**

4. WALL SWITCH MODULE. Lets you turn any wall switch operated lights on or off anywhere in or out of the house. Even dim or brighten them. WS 711 **\$13.95.**

Many more X-10 modules for special applications are available from local retailers, such as Sears and Radio Shack.

SPECIAL BONUS

With each **POWERHOUSE CONTROL SYSTEM** you can order a **MANUAL 'MINI' CONTROLLER** Reg. \$29.95 for only **\$8.95!**



Send order and make checks payable to:

TEX+COMP

P.O. BOX 33064—GRANADA HILLS, CA 91344



AUTHORIZED DEALER



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

TERMS: All prices F.O.B. 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%. Add 3% for Credit Card orders. 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 1/2% sales tax.

Send \$2.00 for our new 99/4A 30-page catalog and buyer's guide.

©1986 TEX+COMP

U.S. Open Tennis

Practice your joystick forehand

By JOHN KOLOEN
U.S. Open Tennis is arguably the finest action game available for the TI99/4A. Those who enjoy tennis may find this game to be irresistible. I have played it for hours on end, have sworn it off after suffering a particularly one-sided loss to the computer only to load it a few days later to restart another series of matches against the 99/4A. I have done this more times than I am able to remember. As much as I might like to, I cannot completely get it out of my system. Anyone hear of TA, Tennis Anonymous.

Of course, I enjoy and play the game of tennis, so playing the computer variety comes naturally. It is therefore difficult for me to separate the tennis enthusiast from the computer hobbyist. Should I conclude that only a tennis player will really enjoy this game? I'm not sure, since lately a teenager of my acquaintance who has never held a tennis racquet has suddenly taken interest in U.S. Open Tennis, the computer game.

Prior to diving into this review, let me note the storied past of this game, which originates in France. Several years ago the game was submitted to Texas Instruments for review as a possible software product. It was at the time the company decided to leave the home computer business, and the game got lost in the shuffle. Unauthorized copies of the game began to surface and Tex-Comp and others began a search for the program's author in order to obtain distribution rights. Until late last year the program was distributed exclusively by Unisource. Now, it is being distributed exclusively by Tex-Comp.

Performance: U.S. Open Tennis is close to perfect. Occasionally it mimics real life with a "bad call," but anyone who has ever played tennis can accept that. Beyond that, its

Review

Performance	A
Ease of Use	A
Documentation	B
Value	A
Final Grade	A

Cost: \$9.95, plus \$3 shipping and handling.
Manufacturer: Nice Soft (Tex-Comp, P.O. Box 33084, Granada Hills, CA 91344)
Requirements: Extended BASIC, memory expansion, disk system, joystick

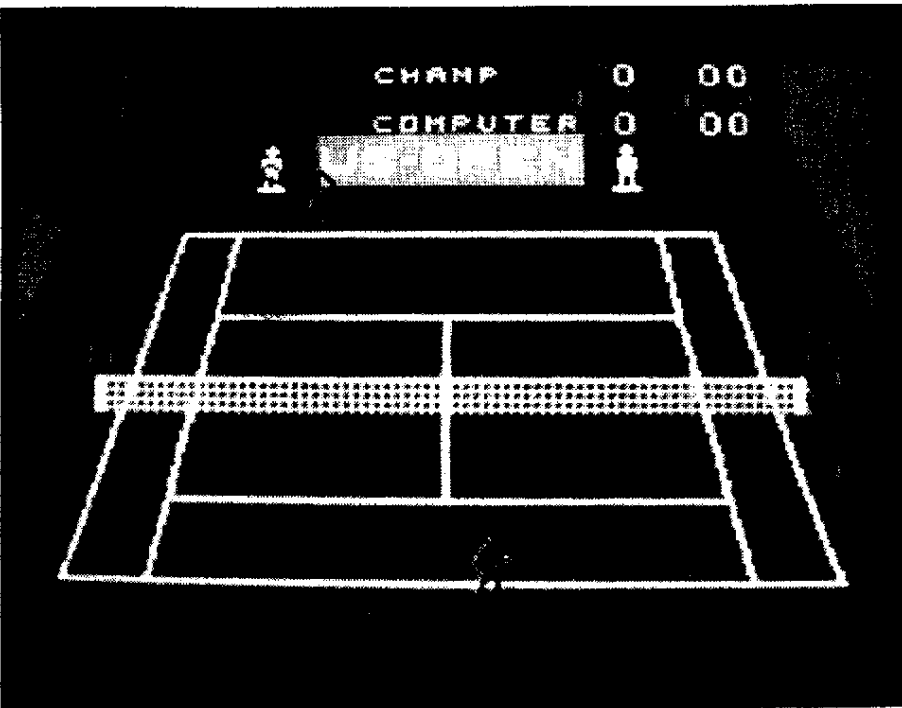
score-keeping mechanism seems to be flawless. All input is via the joystick, with the fire button used to swing the racquet at the ball. A variety of strokes are available, including lobs, overheads, groundstrokes and volleys.
U.S. Open Tennis is written entirely in assembly language. There are

three levels of play: beginner, intermediate and expert. The higher the level the faster the play. I recommend the slow-paced game to children and the fast-paced game to those who think they are ready to take on the pros.

U.S. Open Tennis includes three courtside color schemes, depending upon the surface you want to play. There are color schemes for grass, clay and hard courts, though I was not able to discern a difference in the effect the various surfaces have on the ball. Although U.S. Open Tennis makes full use of color, the game may be played on a black and white or monochrome monitor with no loss in playability.

Prior to starting a match, the user selects the level of play and the number of players (one may play a human opponent or the computer). The game also prompts for names that will appear on the scoreboard. The scoreboard is visible throughout

(Please turn to Page 40)



PRBASE

This database comes in handy

By JOE NUVOLINI

This month we're going to take a look at Bill Warren's new database program, PRBASE.

Bill is secretary of the Rocky Mountain 99ers and lives in Aurora, Colorado. PRBASE is being distributed under the Freeware concept, and Bill is asking only \$10 for the program, an exceptional buy.

PRBASE is a disk-based fast access database management system written in assembly language. The program currently loads from the Editor/Assembler, the Utilities option of TI-Writer or from Extended BASIC.

The first thing you do upon receiving the program is to print the PRBASE:DOC file. There is a short file called HOW2PRINT that tells you how to do it, but it is printed using option 4 of the Editor/Assembler. Make sure you have plenty of time, because it takes a while to print but is an excellent product. Now read it!

Once that is done, you are ready to start. Load the file called CREATE. Now you can design an input screen using a maximum of 255 characters divided into a maximum of 32 fields. Note that if you set off the actual input areas of the screen with brackets, everything you input will be upper case regardless of the alpha lock position. If you set them off with braces, you can enter either upper or lower case.

You can lay out the input screen any way you like and even add graphic borders if you choose. One note of caution here: If in the create mode you press FCTN 3, ERASE, while working on your input screen, it erases the entire screen, not just the line you are on. The mailing labels and reports formats are also generated here and can be up to 10 lines long. The files generated by PRBASE are Display Variable/80 and are compatible with TI-Writer and the Editor/Assembler. Save the input screen, label and report formats, once designed, on the disk that will contain

Review

Report Card

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

Cost: \$10

Manufacturer: William M. Warren,
2373 Ironton St., Aurora CO 80010

Requirements: Console, monitor or
TV, memory expansion, disk system,
Extended BASIC, TI-Writer or Edit-
or/Assembler, printer optional

your data. The first nine sectors of your data disk will contain the information you design with the CREATE file. The remaining sectors are reserved to store your data, one input screen per sector or 350 entries. Bill is planning to increase that number for those

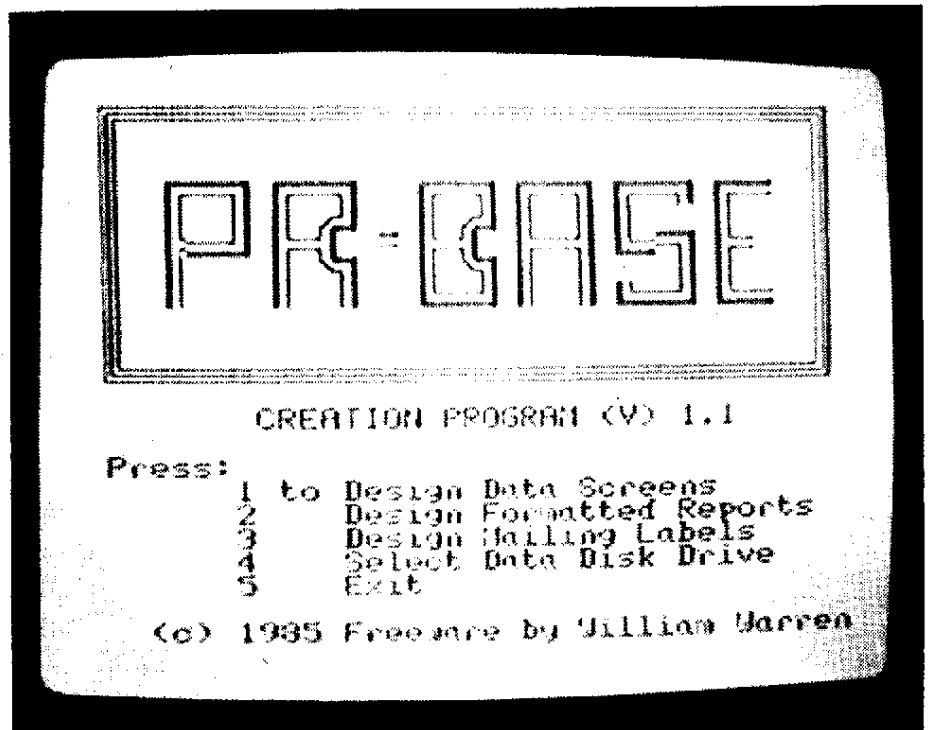
with double-sided capacity.

Now you're ready to use the PRBASE program itself. Load it and enter your datafile name and, voila, your input screen is displayed. Note that when you first access your data disk the program will build an index on the first field in your input screen. Therefore, you should place your most significant piece of data at this location. You can change the index field by selecting I, moving the cursor to the desired field and pressing FCTN 6, PROC'D. You must do this if you plan to sort S on the field.

Once indexed, the contents can be viewed by entering V and holding down the space bar. The contents will display across the bottom of the screen.

Now, let's look at the other functions available in this mode. When you press H you get a help screen that tells you what happens when you press the other keys. If you want to add records, press A, and the program will display

(Please turn to Page 40)



TENNIS—

(Continued from Page 38)

the match in the background.

While music is used to good effect during the beginning sequences, speech is used during the game to call out scores. It's not quite perfect, as "love" sounds like "loave," but I don't find this to be a distraction. There is also an attempt to create crowd noises but this simulation is not very convincing and is heard only occasionally.

Graphics are quite good. There is a convincing three-dimensional effect, and the figures that represent the players look human-like—one is black and the other is blue. The ball includes a shadow, which makes it easier to follow. When the ball hits the net, the net gives. Two ball boys are stationed at the side of the court to chase down net shots.

The matches are set up for best 3-of-5 sets, with 7-point tiebreakers when the set score reaches 6-6. The game uses United States Tennis Assn. rules for tie-breakers, with the first service going to the "ad" court and players rotating sides every six points. Match, set and game scores are continuously displayed for easy reference.

All my games against the computer are played at the expert level. As such, I win about half of them. Most of these matches go five sets. The computer seems most vulnerable to hard, cross-court forehands but can handle just about anything that its player can get to. Its serve is less predictable than mine—which means it has more double-faults than I. Also, it hits more service winners.

Ease of Use: Getting used to controlling your player takes some doing. All control is through the joystick, and the difference between a cross-court forehand and a ball that goes back straight at your opponent depends on when you pull the stick to the left or right and at what point you press the fire button to hit the ball with the racquet. It takes practice to gain complete control of the racquet and even then your timing has to be

on the mark to control the ball on every shot. As in actual tennis, there are forced and unforced errors.

Documentation: If there is a fault to this game (no pun intended) it is in the documentation. The documentation may be viewed on the screen or dumped to a printer. While it addresses the various aspects of the game, it doesn't provide much advice on how to master it. I basically used trial and error to learn how best to control the direction of the ball.

Value: This game is worth an A+ to me, since I play it a lot. I've easily gotten my money's worth and more. Because it features three levels of play, I feel it is accessible to virtually anyone. The first level is slow but provides the same variety of strokes and playability as the third level. While a good player will always beat a poor player no matter what the level of play, the slow-paced level makes it a game that can be enjoyed by adults and elementary-age children at the same time. Younger kids can enjoy success while the more experienced adults are still challenged to return the shots made by their children. The game has potential as a party game or for serious one-on-one competition between friends.

As a bonus, Tex-Comp has included several other games on the disk with U.S. Open Tennis. Among them is what is touted as "the original Munch Man." However, this has nothing to do with the "A" grade I give U.S. Open Tennis. These other games are nice to have, but U.S. Open Tennis remains a top value in my book. Tennis, anyone?

PRBASE—

(Continued from Page 39)

the first empty record, starting with the currently displayed record. It's always good, therefore, to first press N (screen number) and enter 1 to return to the first screen before selecting A. Now input your data and it will be saved to your data disk after you complete each screen.

If you want to go back and edit a screen you have already finished you

must first find it, so let's look at the three search options. The first is global search, G. Here you can input a string up to 19 characters long and the program will search for the string in all the fields on all the screens. It takes about 90 seconds to search the entire disk. On all the searches, pressing FCTN 6 after finding the first occurrence will continue the search. If you press FCTN 7 the current record displayed will be printed to the currently selected output device using the last selected report format. Pressing FCTN 8 will print all of the occurrences of the string selected. The F search will find a string but will search only one field in all the screens, obviously faster. The last is the U or use index search. This search will find any record on the disk in less than one second. You must use a string that is in the current index field.

Now that you have found your record you can edit it by pressing E and moving the cursor over the field you want to edit with the ENTER key or the FCTN arrow keys. Enter D if you want to delete a record. The program will ask you if you are sure before deleting the record displayed. The L command will print your mailing labels, while R will give you a menu of your report formats to select from. The labels currently print one across but will be changed to offer other options in a future version. The O command allows you to re-select your data output drive number and your output device, i.e., PIO/1, etc. The P command will print the current screen to the output device selected in 40 or 80 column format. The B command will allow you to "boot up" another data disk without reloading the PRBASE program. Q stands for quit, and after you select it, you will be asked if you are sure. Answer Y and you are gone.

The C command needs some explanation. It will make a copy of your data disk if you want one. It must be copied by a program like Masscopy. The TI Disk Manager will not do it. It will tell you that the disk is not formatted. If you put Masscopy on your PRBASE disk, you should put MASSCOPY, MC3 and MCINST on it, renaming the MASSCOPY file

(Please turn to Page 48)

Newsbytes

Amerisoft closing out TI-brand wares

Amerisoft of Acworth, Georgia, is closing out its TI-brand merchandise.

Boyd Cone of Amerisoft says the company sent out announcements of the sellout of TI merchandise.

"This is your Munch Man, your TI Invaders, that kind of thing," he says.

He says that the company will continue to merchandise peripherals, disk drives and printers and "anything generic for other machines" for the TI, as well as third party software.

For further information, contact Amerisoft International, P.O. Box 2127, Acworth, GA 30101.

New users group forms in Ontario

The Waterloo Regional TI-99 Club is a new users group for 99/4A users in Waterloo Region (Ontario, Canada) and surrounding areas.

John Van Weelie, chairman for the group, said he would be interested in assistance from other groups in regard to software exchanges, tips and correspondence.

He said the group is trying to compile an international directory of TI99/4A users groups and bulletin boards and would like users groups to send information including the group's name, address, contact person, phone number, number of members, membership fees, bulletin board number, hours of operation, baud rates, etc.

Address is Waterloo Regional TI-99 Club, P.O. Box 1563, Cambridge, Ontario, Canada N1R 7G8.

CCC TIBBS announced

Art Hazboun, co-sysop, announces a 24-hour TIBBS, CCC (Computer Conferencing Center).

The board operates at (213) 212-5267 at 300 and 1200 baud and has a TI SIG. Hazboun says new users will be verified first.

T.O.D. Editor is \$20

The T.O.D. Editor program from Asgard Software is \$20, according to the manufacturer. A review in the March issue incorrectly listed the price as \$20.

Texaments releases Artist's Companion #2

Texaments announces Artist's Companion #2, which it says is a combined effort by Dave Rose, author of Character Sets and Graphics Design I and II, and Robert Petrocone of Enterprise Software.

The manufacturer describes Artist's Companion #2 as a complete set of two disks jammed with support items for Inseebot's TI Artist graphics design package, version 2.0 only. The two disks are said to include 13 individual character sets to be used with the alphanumeric entry feature of TI Artist, 60 small original instances to be merged with any user picture screen and Artist's Connection.

Artist's Connection is described as a small program generator which allows instances created with TI Artist to be easily used in BASIC and Extended BASIC programs.

The cost for the two disk set is \$9.95 plus \$1.50 postage and handling.

For further information, or to order, contact Texaments, 53 Center Street, Patchogue, NY 11772 or (516) 475-3480.

Thomson to fill orders for certain programs

Don Thomson of Thomson Software, which is closing April 15, says orders for DISK + AID, MEMORY MANIPULATOR and CREDIT CARD DATA BASE will be processed by him if the sender indicates on the outside of the envelope that the order is for one of those three programs.

Thomson says only orders marked in this way will be filled, and all other orders will be returned.

Thomson Software's address is 1461 Beach St., Muskegon, MI 49441-1099.

TI section on BBS

The RBBS-WSC IBMPC has a TI section for uploading and downloading using the X-Modem protocol, according to Richard Morrison, assistant sysop.

The board, at (801) 626-7906, operates from 4:30 p.m. to 7:30 a.m. Monday through Thursday, and from 4:30 p.m. Friday to 7:30 a.m. Monday at 300 and 1200 baud.

Access level 7 is required for uploading and downloading. Long distance callers may register by phone or by sending name, mailing address, phone number, password, computer type and a return self-addressed stamped envelope for verification to Scott B. Birkinshaw, Associate Professor of Library Science, Stewart Library #2901, Weber State College, Ogden, UT 84408.

Program Manager, 6000+ module set

Pilgrims' Pride software announces Program Manager by John D. Keown, expected to be available by April 1.

The program requires the "6000+" module, also expected to be available April 1.

Program Manager, written entirely in assembly language, is said to organize, categorize, access and load and run more than 11,000 assembly language programs "almost instantly." Program Manager resides in the computer memory until the system is shut down; "QUIT" will not dump the program.

According to the manufacturer, Program Manager has a user definable automatic disk drive search in any order and will support and search up to five disk drives in any configuration.

The manufacturer says the program will support Myarc's 128K or 512K memory expansion cards and has user definable screen color display. According to the manufacturer, Program

(Please turn to Page 42)

Newsbytes

(Continued from Page 41)

Manager supports almost all commercial and freeware assembly language programs.

Besides the 6000+ module, Program Manager requires the TI99/4A console, 32K memory expansion and single disk drive. Optional are the Myarc 128K or 512K memory expansion card, multiple drives in any configuration and the Navarone Widget.

Software and 6000+ module are \$69.95; the software only is \$25.95.

Pilgrims Pride also plans to release another product, tentatively named the Modu-Dump program, about June 1.

This program, also by Keown and also requiring the 6000+ cartridge, is said to allow the user to save cartridges to disk. The manufacturer says it is hoped that by the time of introduction, the program will work with from 90 to 95 percent of the cartridges produced for the TI99/4A. The program is expected to be priced at approximately \$25.

For further information, contact Pilgrims' Pride, P.O. Box 2, Hatboro, PA 19040 or (215) 441-4262. Price lists are available for users groups, dealers and distributors.

Paris, Texas, users organize TI group

A users group has been formed in Paris, Texas for TI99/4A users.

The group's first meeting is scheduled for 7 p.m. April 24 at the Paris Junior College Alford Life Long Learning Center, Room 109.

For further information, contact Jerry Keisler, 2221 College, Paris, TX 75460 or (214) 785-5694.

Game teaches Bible books by computer

Trinity Systems has released its Bible Books Game for the TI99/4A.

The manufacturer calls it "an enjoyable way to learn the names of all the books of the Bible along with important people, topics and scriptures."

The game can be played by one or two players and each player can choose from among nine different skill levels. According to the manufacturer, this feature allows players with different abilities to compete equally.

The object of the game is to use clues selected by the computer to guess the correct Bible book name and either its sequence number or number of chapters. On-screen instructions prompt the user to enter guesses and also show whose turn it is. Graphics indicate how many books are left to guess before the game ends.

Points are given for each correct letter in the guess and bonus points are awarded for a perfect entry. Musical tones and flashing colors accompany guess checking and bonus scoring. Clues, scores, game status and skill levels are all kept on the screen.

For incorrect guesses, the first misspelled letter is highlighted, a buzzer sounds, and the correct answer is displayed along with musical tones the manufacturer describes as "mocking." After 10 Bible books are alternately guessed by each player, the game ends and the final score is displayed.

Ten different evaluations range from PERFECT for the best possible score, to NOVICE and SEE TUTOR for the lowest scores. A percentage evaluation is also calculated and displayed. The game can be ended before all 10 turns are over and the score will be evaluated at that point.

The TUTOR mode displays the Bible books and all their clues in sequential order. The user may press any key to go to the next book before or after all the clues are given. TUTOR can be started in the Old or New Testament.

All Bible books and their sequence list automatically. If the user holds down the space bar, the listing freezes and the user may press any other key to transfer directly to the instruction screen, an on-screen reference of game point values and special functions.

The game runs in TI BASIC and requires no additional memory or software. It is available on cassette for

\$19.95 from Trinity Systems, 1022 Grandview Ave., Pittsburgh, PA 15237, (412) 366-5811.

Network formed for online professionals

Chris Wesselman and John Everett of the Dallas, Texas, area announce the formation of the Network of Online Professionals, which they say is designed to bring to "an inherently isolated profession the benefit of peer group communications."

Membership in the association is open to any experienced information professional who is a frequent user of online databases, including librarians, researchers, independent information brokers and in-house information specialists.

The network is on Dialmail, an electronic mail service of Dialog Information Services Inc. A conference has been established to encourage discussion of issues of interest to the information community; recent articles have discussed the current developments in videotext and a review of the information industry association's BOCA IV conference on "The Market's Impact on Information and Technology." A bulletin board has been established. It allows members to post brief "fact sheets" about themselves. This allows for referrals and subcontracting among members, according to Everett.

No membership fee is required to participate in the Network of Online Professionals; the only cost is connect time to Dialmail. For further information, contact Wesselman (user ID #9366) or John Everett (user ID #9993) on Dialmail, or via land mail at P.O. Box 157007, Irving, TX 75015.

Quality 99 Software announces programs

Quality 99 Software announces three new programs, EZ-Loader II, Data Base 99 Sampler and Chart Maker II.

EZ-Loader II is said to show up to (Please turn to Page 43)

User Notes

Word counting TI-Writer files

Not everyone wants or needs to know the number of words in a text file, but there are times when this information can be useful. Knowing the number of words can help editors estimate the length of an article before it is set into type. It can help newsletter writers plan for their space requirements. It can even be helpful for those freelancers who are paid for their articles by the word.

The following program was submitted by B. Davies of Leander, Texas.

Called Wordcount, it is designed to count the number of words in TI-Writer text files. The program uses a DIM statement to eliminate TI-Writer printer commands from the wordcount. This slows the process down, but it gives a more accurate count of the number of words that will actually appear on the printed page. Readers may increase this "exception" list by increasing the number of DIM elements. The program requires Extended BASIC and a disk. The program is easy to use. It prompts the user for a TI-Writer file name and then takes over. At the end it will tell you

the approximate number of words that are included in the file.

```

20 :*****
30 :    ** WORDCOUNT **
40 :    BY B. DAVIES
50 :    COUNTS WORDS IN A TEXT
60 :    FILE IN
70 :    DISPLAY/VARIABLE FORMAT
80 :    REQUIRES XBASIC
90 :*****
100 CALL CLEAR
110 DIM B$(20)
120 B$(1)=".AD"
130 B$(2)=".BP"

```

(Please turn to Page 44)

Newsbytes

(Continued from Page 42)

127 filenames. The program is said to have the capability of loading and running a program from any drive with only one keystroke. It runs BASIC, Extended BASIC and assembly

language programs. The manufacturer says it does not wipe out a resident assembly language program.

According to the manufacturer, EZ-Loader II automatically shows the user a menu of all the files on a disk. The program is unprotected and sells for \$19.95.

Data Base 99 Sampler is sold as a "tryout" for the regular Data Base 99. It is said to contain all features of Data Base 99, but is limited to five records. The program sells for \$4.95 and includes a \$5 rebate on the purchase of regular Data Base 99.

Chart Maker II is a stand-alone version which does not require Draw 'N Plot. The menu-driven program is said to enable the user to create bar graphs and pie charts and output to screen or printer at normal or full page size. The program requires an Epson or a Prowriter compatible printer. It sells for \$19.95.

For further information, contact Quality 99 Software, 1884 Columbia Rd. #1021, Washington, DC 20009, or (202) 667-3574.

BA-Writer Version 3.0 scheduled for May 1

Release of BA-Writer Version 3.0 is

scheduled for May 1.

The new version with all updates is said to be modified for use with the Myarc disk controller.

BA-Writer is manufactured by Paolo Bagnaresi, Via J.F. Kennedy 17, 20097 San Donato Milanese, Italy. Cost is \$10.

Unisource leaving TI market

Unisource Electronics of Lubbock, Texas, has announced plans to go "out of the TI merchandising business."

Bryan O'Neal, marketing manager for Unisource, says the company would be pursuing other direct mail interests.

"The TI market has been profitable and we want to thank our loyal customers," he says. "We have appreciated the loyalty of all our customers to the TI market and want to wish both them and our competitors the best of success in continuing to support the TI."

The company is currently limiting its TI orders to in-stock merchandise, which it is offering at "enormous savings" until it is gone, O'Neal says.

Orders may be placed with Unisource Electronics Inc., P.O. Box 62420, Lubbock, TX 79464 or 1-800-858-4580, in Texas, (806) 745-8834.

FREEWARE UPDATE—

(Continued from Page 36)

Harms, 6527 Hayes Ct., Chino, CA 91710.

WITHDRAWALS

The Super-Mail program formerly offered by Henry J. Beck has been withdrawn. Also, Ron Rutledge has withdrawn his XBASIC disk cataloger, The DIRECTOR.

Anyone wishing to have a Freeware announcement included in MICROpendium's Freeware listing may do so by submitting a copy and brief description of the program, and a note indicating that it is in the public domain, to MICROpendium. Complete Freeware listings, updated quarterly, are available from MICROpendium for \$1 (or 50 cents and a self-addressed stamped envelope). Freeware announcements will continue to be published in the listing until withdrawn by the persons submitting them or the publisher.

User Notes

(Continued from Page 43)

```

140 B$(3)=".CE"
150 B$(4)=".CO"
160 B$(5)=".DP"
170 B$(6)=".FI"
180 B$(7)=".FO"
190 B$(8)=".HE"
200 B$(9)=".IF"
210 B$(10)=".IN"
220 B$(11)=".LM"
230 B$(12)=".LS"
240 B$(13)=".ML"
250 B$(14)=".NA"
260 B$(15)=".NF"
270 B$(16)=".PA"
280 B$(17)=".PL"
290 B$(18)=".RM"
300 B$(19)=".SP"
310 B$(20)=".TL"
320 PRINT "ENTER TEXT FILE NAME"
330 PRINT
340 INPUT "":D$
350 PRINT
360 OPEN #1:D$,INPUT,DISPLA
Y,VARIABLE $0
370 LINPUT #1:A$
380 IF EOF(1)=1 THEN 520
390 IF E=1 THEN 440
400 FOR B=1 TO 20
410 IF POS(A$,B$(B),1)=1 THE
N 370
420 NEXT B
430 E=1
440 FOR B=1 TO LEN(A$)
450 C=ASC(SEG$(A$,B,1))
460 A=((C<64)*(C<91))+((C>96
)*(C<123))+((C>47)*(C<58))+
(C=39)
470 IF A=0 THEN 480 :: D=1 :
: GOTO 490
480 IF D=0 THEN 490 :: W=W+1
:: D=0
490 NEXT B
500 D=0 :: IF A=1 THEN 510 :
: GOTO 370
510 W=W+1 :: GOTO 370
520 PRINT "THERE ARE ABOUT "
;W;"WORDS IN THE TEXT FILE"
530 END

```

Gaining ground on ACCEPT AT

We're still looking for the ultimate

solution to what has become known as "the multi-line ACCEPT AT problem." As notes in February's Feedback column, the Extended BASIC ACCEPT AT command doesn't permit entry of full-length strings. In an effort to advance the dialog, Barry Traver of Philadelphia submitted the following suggestion.

```

900 M$="" ! Multi-line ACCEP
T AT subroutine by Barry Tra
ver. (No cursor.)
910 DISPLAY AT(R,1):SEG$(M$,
1,28):SEG$(M$,29,28):SEG$(M$,
57,28):SEG$(M$,85,28):SEG$(
M$,113,28) ! Row (R) must be
passed to subroutine
920 CALL KEY(0,K,S):: IF S<1
THEN 920 ELSE IF K=8 THEN 9
40 ELSE IF K=13 THEN 950 EL
E IF K=7 THEN 900 ! Backspac
e (FCTN-S) and Erase (FCTN-3
) are active.
930 IF K<32 OR K>126 OR LEN(
M$)=140 THEN 920 ELSE M$=M$&
CHR$(K):: GOTO 910
940 IF LEN(M$)<>0 THEN MS=SE
G$(M$,1,LEN(M$)-1):: GOTO 91
0
950 RETURN ! This version is
set for 140-character maximu
m (like LINPUT).

```

What is really needed, however, as one of your subscribers noted, is an assembly language subroutine that can be accessed from Extended BASIC," Traver notes.

Included below is a sample program to test out the above subroutine:

```

100 DISPLAY AT(10,1)ERASE AL
L:"What is the sentence?" ::
R=12 :: GOSUB 900 :: PRINT M
$ :: STOP

```

Keeping track with Triple Tech

John P. Gallagher Jr., stationed at Loring AFB, Maine, describes himself as a "satisfied owner (die-hard) of a

TI99/4A." After reading a review of CorComp's Triple Tech card in MICROpendium "I decided to accept (the) challenge of developing a directory program utilizing this unique card."

"My program can be utilized as an ongoing update of the time on the screen, or a screen disk directory or, if you have a 'PIO' printer, you may obtain a printout of the directory. Regardless of what directory mode you use, you will receive the day, date and local time the directory is run. Error trapping routines eliminate annoying program breaks (such as asking for a drive that doesn't exist or a directory

(Please turn to Page 45)

TODAY IS

(WEDNESDAY)

THE CALENDAR DATE IS

(01/29/86)

THE CORRECT TIME IS

21:33:02

(LOCAL)

KEY <ENTER> TO RUN DIRECTORY

```

DRIVE NUMBER (1-2) 2
DATE 01/29/86 (WEDNESDAY)
TIME 21:33:02
DSK?-DISKNAME= DEAR/B
AVAILABLE= 263 USED= 95
FILENAME SIZE TYPE P
CLOCKSET 2-- PROGRAM --
DIR 21 DIS/VAR 80
JANJOB 12 DIS/VAR 80
LOCKERDAY 12 DIS/VAR 80
MAGARYI 12 DIS/VAR 80
METRO 12 DIS/VAR 80
MICROFILE 20 DIS/VAR 80
NSET 2 DIS/VAR 80
NATO 2 DIS/VAR 80
SOUNDCLOCK 17 PROGRAM
KEY <ENTER> FOR A PRINT-OUT
ANY OTHER KEY TO QUIT
ANOTHER DISK? (Y/N) N

```

Sample screen dump of the Triple Tech directory program.

User Notes

(Continued from Page 44)

from a drive that is empty or not close.)"

The hardware requirements are included at the beginning of the listing. Although the program is written for use with a parallel printer, readers may easily change this to RS232. Also, printer control codes may have to be changed, depending on the printer used.

```
100 REM *****
*****
110 REM *
*
120 REM * DATE/TIME DISK CAT
ALOG *
130 REM * USING "TRIPE TECH
CARD" *
140 REM * PERIPHERALS :
*
150 REM * EXTENDED BASIC CAR
TRIDGE *
160 REM * EXPANSION BOX
*
170 REM * RS232 INTERFACE
*
180 REM * TRIPLE TECH CARD
*
190 REM *DISK DRIVE(S)
*
200 REM * "PIO" PRINTER
*
210 REM *
*
220 REM *AUTHOR: JOHN P. GAL
LAGHER *
230 REM *          SAGE(TM) SO
FTWARE *
240 REM *****
*****
250 !
260 ! SAVE AS "DSKX.LOAD" FO
R AUTOLOAD
270 !
280 CALL CLEAR
290 CALL SCREEN(5)
300 FOR CH=0 TO 14
310 CALL COLOR(CH,16,5)
320 NEXT CH
330 OPEN #99:"CLOCK"
340 INPUT #99:X$,Y$,Z$
350 IF X$="0" THEN X$=" MON
DAY "
360 IF X$="1" THEN X$=" TUES
```

```
DAY "
370 IF X$="2" THEN X$="WEDNE
SDAY"
380 IF X$="3" THEN X$=" THUR
SDAY"
390 IF X$="4" THEN X$=" FRI
DAY "
400 IF X$="5" THEN X$=" SATU
RDAY"
410 IF X$="6" THEN X$=" SUN
DAY "
420 DISPLAY AT(01,04):"
"
430 DISPLAY AT(05,09):"*TODA
Y IS*"
440 DISPLAY AT(07,09):"(:X$
;)"
450 DISPLAY AT(10,03):"*THE
CALENDAR DATE IS*"
460 DISPLAY AT(12,09):"(:Y$
;)"
470 DISPLAY AT(16,04):"*THE
CORRECT TIME IS*"
480 DISPLAY AT(18,10):Z$
490 DISPLAY AT(20,10):"(LOCA
L)"
500 DISPLAY AT(01,04):"SAGE
(tm) J. Gallagher "
510 !KEY ROUTINE TO RUN DIRE
CTORY
520 DISPLAY AT(22,02):"KEY (
ENTER) TO RUN DIRECTORY"
530 CALL KEY(0,K,S):: IF S=0
THEN 340
540 IF K=13 THEN 550
550 CALL CLEAR
560 DIM TYPE$(5)
570 TYPE$(1)="DIS/FIX"
580 TYPE$(2)="DIS/VAR"
590 TYPE$(3)="INT/FIX"
600 TYPE$(4)="INT/VAR"
610 TYPE$(5)="PROGRAM"
620 INPUT "DRIVE NUMBER (1-3
)? ":I
630 I=INT(I)
640 PRINT "DATE ";Y$;" ";("
;X$;)"": "TIME ";Z$
650 IF (I<1)+(I>3)=-1 THEN 5
70
660 ON ERROR 1270 :: OPEN #1
:"DSK"&STR$(I)&".",INPUT,RE
LATIVE,INTERNAL
670 ON ERROR 1270 :: INPUT #
1:A$,J,J,K
680 DISPLAY "DSK";STR$(I);"-
DISKNAME=";A$;"AVAILABLE="
```

```
;K;" USED=";J-K
690 DISPLAY : "FILENAME SIZ
E TYPE F ":"-----
";
700 INPUT #1:A$,I,J,K
710 IF LEN(A$)=0 THEN 790
720 DISPLAY :A$;TAB(12);J;TA
B(17);TYPE$(ABS(I));
730 IF ABS(I)=5 THEN 760
740 B$=" "&STR$(K)
750 DISPLAY SEG$(B$,LEN(B$)-
2,3);
760 IF I>0 THEN 700
770 DISPLAY TAB(28);"Y";
780 GOTO 700
790 PRINT RPT$("~",28)
800 PRINT "KEY (ENTER) FOR A
PRINT-OUT:" "ANY OTHER KEY T
O QUIT"
810 CALL KEY(0,K,S):: IF S=0
THEN 810
820 IF K=13 THEN 860
830 INPUT "ANOTHER DISK? (Y/
N) ":Y$
840 IF Y$="Y" THEN CLOSE #99
:: CLOSE #1 :: GOTO 280
850 IF Y$="N" K THEN END
860 CLOSE #1 :: OPEN #88:"PI
O",OUTPUT,VARIABLE 132
870 PRINT #88:CHR$(27);CHR$(
66);CHR$(3)
880 PRINT "PLEASE VERIFY DRI
VE":
890 INPUT "NUMBER IN USE ":I
900 IF (I<1)+(I>3)=-1 THEN 9
10
910 TYPE$(1)="DISPLAY/FIXED
(FILE)"
920 TYPE$(2)="DISPLAY/VARIAB
LE (FILE)"
930 TYPE$(3)="INTERNAL/FIXED
(FILE)"
940 TYPE$(4)="INTERNAL/VARIA
BLE (FILE)"
950 TYPE$(5)="PROGRAM IMAGE
(FORMAT)"
960 OPEN #1:"DSK"&STR$(I)&".
",INPUT,RELATIVE,INTERNAL
970 INPUT #1:A$,J,J,K
980 PRINT #88:RPT$("~",90)
990 PRINT #88:"DRIVE NUMBER
(:STR$(I);)" "DISKNAME=
";A$;"SECTORS AVAILABLE=";K
;" SECTORS USED=";J-K
1000 PRINT #88:RPT$("~",90)
```

(Please turn to Page 46)

User Notes

(Continued from Page 45)

```

1010 PRINT #88:"DATE OF THIS
PRINTING=";Y$;" (";X$;"")
1020 PRINT #88:"THE TIME OF
THIS PRINTING=";Z$;" (LOCAL
)"
1030 PRINT #88:RPT$("~",90)
1040 PRINT #88:"FILENAME";TAB
B(15);"SIZE";TAB(25);"FILE/T
YPE";TAB(55);"RECORD LENGTH"
;TAB(72);"PROTECTED"
1050 IF B$=" " THEN 1060
1060 PRINT #88:RPT$("-",90)
1070 INPUT #1:A$,I,J,K
1080 IF LEN(A$)=0 THEN 1160
1090 B$=" "&STR$(K)
1100 IF STR$(K)="0" THEN B$=
" "
1110 PRINT #88:A$;TAB(15);J;
TAB(25);TYPE$(ABS(I));TAB(62
);SEG$(B$,LEN(B$)-2,3)
1120 IF ABS(I)=5 THEN 1130
1130 IF I>0 THEN 1070
1140 PRINT #88:TAB(72);"Last
File Protected":
1150 GOTO 1070
1160 PRINT #88:CHR$(12):: CL
OSE #1 :: CLOSE #88 :: CLOSE
#99
1170 INPUT "ANOTHER DISK? (Y
/N) :";Y$
1180 IF Y$="Y" THEN 1200
1190 IF Y$="N" THEN 1260
1200 CALL CLEAR
1210 PRINT "PLACE NEW DISK I
N DRIVE":::
1220 PRINT "PRESS ANY KEY"
1230 CALL KEY(0,K,S)
1240 IF S=0 THEN 1230
1250 GOTO 280
1260 END
1270 CLOSE #99
1280 CALL SCREEN(7):: FOR CH
=0 TO 14 :: CALL COLOR(CH,16
,7):: NEXT CH
1290 CALL CLEAR :: DISPLAY A
T(10,04):"You Forgot to Clos
e" :: DISPLAY (12,04):"or Lo
ad the Drive" :: DISPLAY AT(
14,04):"Specified, Try again
."
1300 FOR D=1 TO 1500 :: NEXT
D
1310 CALL INIT :: CALL LOAD(
-31961,149)
1320 STOP

```

Classified

Policy

Classified advertising is a unique feature of MICROpendium. The cost is 20 cents per word. Classified display, (i.e., special formatting or graphics) is \$8 per column inch. Classified advertisements must be paid in advance. Classified advertisers may request a category under which they would like their advertisement 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 advertisement.

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.

Software

TIPS FROM TIGERCUB

Full disk of 50 programs, routines, files from the well-known Tigercub Tips newsletters #1-#14, \$15 postpaid. Tips Vol. 2 diskfull of 64 programs, files from newsletters #15-#24, \$15, or both for \$27 postpaid. Tigercub Software, 156 Collingwood, Whitehall OH 43213 v3n5

SUPERBUG II

The features of TI's Debugger and Super Debugger have been combined, debugged, and enhanced. New features allow you to change output device and screen colors. A version for loading into SUPER SPACE memory is included along with a 40-page manual. Send \$10.00 to Edgar Dohmann, Route 5 Box 84, Alvin TX 77511. v3n3

NUTS & BOLTS

A diskfull of 100(!) utility subprograms for the TI99/4A in XBASIC MERGE format, ready to merge into your programs. With documentation, just \$19.95 postpaid! And now ready, NUTS & BOLTS -2, another diskfull, another 100 subprograms, also \$19.95, or both for \$37 ppd. Tigercub Software, 156 Collingwood, Whitehall, OH 43213. v3n5

18 ORIGINAL EXTENDED BASIC

Programs, mostly games. Half of these once sold for over \$30! Avocado Adventure for the Adventure module included as a bonus! Send 2 diskettes, postage, & \$5.00 or simply \$8.00 to T&T Software, 109 Tee Circle, Salem, VA 24153. v3n3

PERSONAL AUDITOR

Personal finance management application. Contains features to add, edit, delete or void records. Selective search for similar records by date or name, sub-file creation to screen or printer, running balance display, full-featured report generation, custom report generation option, file merging, re-sizing, converting to DIS/VAR80 format, text file display or printing, disk cataloging, password protection, file summarization by budget type, custom budget files for summarization and reference disk label printing, loader for a/l screen dump, choice of 3 character display types, 300 records per file. 32K, XB and disk drive. \$29.95 plus \$2 S/H. PRK DataBasics Box 2642 Grand Junction Co. 81502 v3n3

ATTENTION PROWRITER AND EPSON

compatible printers—CHARACTER SETS AND GRAPHICS DESIGN I, as reviewed in the May 85 MICROpendium, includes 10 character fonts for only \$17.95. CHARACTER SETS AND GRAPHICS DESIGN II includes 8 character fonts, a BANNER program that uses all fonts and a choice of 65 graphics (uses an assy language routine for fast printer output) for only \$12.95. SCREEN IMAGE DUMP VS2 is 100% assembly language and features normal and

Classified

double size dumps, invert video, single keystroke dump at any time in program, starting and ending screen line and tab spacing for only \$16.95. All programs require Disk system, Memory Expansion, and compatible 8 bit dot addressable graphics printer. CSGDI and CSGDI require Extended BASIC while SCREEN IMAGE DUMP requires either Extended BASIC, Mini-Memory or Editor/Assembler. Please enclose PRINTER NAME when ordering or send for more information to DAVE ROSE, 2781 RESOR ROAD, FAIRFIELD OHIO 45014. v3n3

ROCKETMAN CHECKBOOK PROGRAM

Start business organization with the basics. Now NEW COST \$34.95. Requires 1 disk drive, 32K and Extended BASIC. CALIFORNIA PROGRAMS, 4104 San Pablo Dam Rd., El Sobrante, Ca. 94803. 415-222-1626. Calif. residents add 6.5% sales tax. Visa or MasterCard accepted. v3n3

Hardware

QUIET FANS FOR EXPANSION BOX

Replacement high efficiency muffin design fans. Super quiet! No PEB modifications. Instructions included. \$15.50 plus \$2.50 S&H. STATCO, Inc., P.O. Box 145, Townsend, MA 01469-0145 (See Dec. '85 MICROpendium) v3n3

WANTED

TI 1220 card reasonable, 1316 Springfield Road, East Peoria IL 61611 v3n3

WANTED

Used CorComp Triple Tech Card reasonable, used Morning Star CP/M processor, reasonable, used Foundation Z80 card reasonable. Ken Byers, 1316 Springfield Road, East Peoria, IL. 61611. 309 694-1762. v3n3

COMPLETE TI99/4A PACKAGE

Must sell. TI99/4A, TI/P-Box, Disk Controller with two drives (one External), TI/RS232, TI/32K, TI/Color monitor, TI-

Writer, TI-Multiplan, XBASIC, MM-Module, TI-Assembler, PRK and TI-Forth. Also other vendor programs like Disk Fixer, Disk Aid, Memory Manipulator and many others. Business and utility programs valued at over \$2000.00. All manuals, instructions and cables necessary, plus over 1000 BASIC and XBASIC programs. Asking \$900.00. Phone 517-882-8145, Hes Airall, 5738 Wise Rd., Lansing, MI 48910 v3n4

EVERYTHING FOR SALE!

Help! Must sell complete system due to family illness. Hardware includes black console, speech, PE Box, 32K, RS232 and 2 disk drives (SSSD), plus more. And there's so much cartridge and disk software (over 50 disks front & back) plus books, manuals, documentation, newsletters and periodicals there's not enough space here to list. Over \$1500 worth for only \$800 (shipping extra). Send S.A.S.E. for list of equipment and software and terms of sale. Ken Allen, 1004 Jurymast Dr., Oxnard, CA 93030. No phone calls please. v3n3

Miscellaneous

COMPUTER CAMP

The Camp Fitch Computer Camp is entering its 5th year of operation. Located just outside Erie, PA, the residential camp offers summer fun and educational opportunities for boys and girls ages 8 to 18. Individualized instruction is offered with languages ranging from LOGO to BASIC to Assembler, depending upon the age and the experience of the camper. We use a variety of computers including TI's (still the best LOGO going). Outdoor activities include swimming, sailing, horseback riding, and much, much more. For more information contact Roger Patterson, 7366 Ranier Trail, Boardman, OH 44512. v3n3

TI THERMAL PAPER

As low as \$3.00 per roll (in

quantity)—last remaining supply (TI has none left!). Call or write for prices. Pilgrims' Pride—P.O. Box 2—Hatboro, PA 19040—(215) 441-4262 v3n3

IDENTIFY YOURSELF AS A TI-ENTHUSIAST
DISPLAY THIS STICKER



★ Size 3 1/2 x 7 1/2 inches. 3 Colors.
Use as a tool to identify with other users.
Use as a tool to Promote User Group Membership
Use as a tool to find abandoned Hardware/Software
KEEP TI-NAME BEFORE PUBLIC—ENHANCE INVESTMENT VALUE.

Make check or money order payable to:
TI-BOOSTER \$1.50 Ea. or 3 for \$4.00.
3506 Garden Drive 5% less on 36 or more.
Knoxville, TN 37918 4 to 6 wks Delivery.
U.S.A. MAILINGS ONLY

TRIO+ SOFTWARE NEW PRODUCTS

AC transformer to maintain memory of the MYARC 128/512K card when computer is off. Price \$12.00 + \$2.00 S/H. TI-SINGS Your computer can sing! TE-2, Speech, Disk System required. This will help you understand and use Allophones. Input, edit and play back your favorite songs. (words music) Price \$6.00 + \$1.00 S/H.

TI-ARTIST(tm) users send for our new data disk containing Fonts, Slides, Instances and Pictures. Price \$6.00 + \$1.00 S/H

Order from: TRIO SOFTWARE, New Products, P.O. Box 115, Liscomb, IA 50148 v3n3

TI 99/4A GENERAL SUPPLIES

Hardware ★ Software ★ Accessories
Retail Store ★ Full Mail Order Service
We carry a full line of TI computer supplies. Call or write us for information and to join our Mailing List—Free

★ VISA & MasterCard Welcome ★

No Extra Charge

No Handling Fees!

For Mail Order Services

Factory Authorized

Star Printer Service

Pilgrims' Pride Hatboro, PA 19040
5 Williams La (215) 441-4262

Knowledgeable Service

Willing Support v3n4

The LEADING monthly devoted to the TI99/4A

Subscription Fees

\$15 for 12 issues via domestic third class mail
 \$18.50 for 12 issues via domestic first-class mail
 \$18.50 (U.S. funds) for 12 issues Canadian delivery
 \$21.50 (U.S. funds) for 12 issues foreign delivery via surface mail
 \$35.00 (U.S. funds) for 12 issues foreign delivery via air mail
 (Texas residents add 77 cents sales tax)

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 \$1.35 per issue desired in a check or money order. (U.S. and Canada; Texas residents add 5.125% sales tax.) For foreign airmail delivery, add \$2 per issue, 50 cents per issue surface mail. All prices listed are U.S. funds.

Send me the next 12 issues of **MICROpendium**. I am enclosing \$ _____ in a check or money order in U.S. funds (Texas residents add 77 cents sales tax.) Mail to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680

Name _____
 Address _____
 City _____
 State _____ ZIP _____

v3n3

Time to RENEW?

Readers who are interested in renewing their subscription to MICROpendium without missing a single issue must do so before their current subscription expires.

At right is a facsimile of a typical mailing label attached to the front of subscriber copies.

The upper line includes information about the month the subscription was entered and the number of the first issue the subscriber received. An asterisk included indicates that the expiration number will be in 1986 (1987 if S1*), a caret that the expiration number will be in 1987. Renewals changing from third to first class mailing will not have the code changed until the month the first class mailing begins.)

When renewing subscriptions, please include a copy of a mailing label or write out the codes that appear on the label

A1284S2 105
 JOHN SMITH
 1324 ELM ST.
 PEORIA IL 60001

Code description

Refers to status of subscription. "A" means active. The combination of the next four numbers refers to the month and year the subscription was actually entered.

The next 2-4 characters represent the type of subscription and the number or initial of the month of the year the subscription started. "S" means subscriber. Refer to the following definitions for the issue your subscription started:

2=February	6=June	0=October
3=March	7=July	N=November
4=April	8=August	D=December
5=May	9=September	1=January

Our subscription year runs from February to January. In other words, our first edition of any year will be the February edition. The last edition of any year will be the following January's edition.

PRBASE—

(Continued from Page 40)

COPY. The C command may be done away with in a future version and the copy program loaded from the Extended BASIC loader instead. I, for one, like this option better.

So much for the action commands. When you use the PRBASE program, the following are also available:

FCTN X Scroll to next screen
 FCTN E Scroll to previous screen
 FCTN D Next alphabetical screen
 FCTN S Previous alphabetical screen
 CTRL X Rapid scroll screen 1-350

CTRL E Rapid scroll screen 350-1

CTRL D First alphabetical screen

I've told you all of the good things, now there are a few negatives. The problems listed here are really only inconveniences. They include the lack of two-by labels, the lack of a skip over perf when printing long lists and the fact that setting up the reports and mailing labels is a bit tedious and confusing. I have had several calls on this and am apparently the only one that I know in our group who has been successful in getting them all to work. The skip over perf can be overcome by printing only 50 names at a time. Some of these things will be corrected in future versions while others will not.

This may seem a bit longwinded, but, believe me, I have only touched the surface. The possibilities available for locating data and formatting reports are enormous. Whether you use it for keeping track of club information, as we are doing in our users' group, or just for your own personal mailing list, you will find this program an excellent buy at \$10.

This one is a winner. Between Dave Vaughan (BITMAC), Tom Frerichs and Mike Holmes (4A/Talk) and Bill Warren (PRBASE), the Rocky Mountain 99ers have a wealth of programming talent. It is unlikely that three such fine programs have come out of any other single club in America.