Covering the TI99/4A EXCLUSIVELY!

MICROpendium

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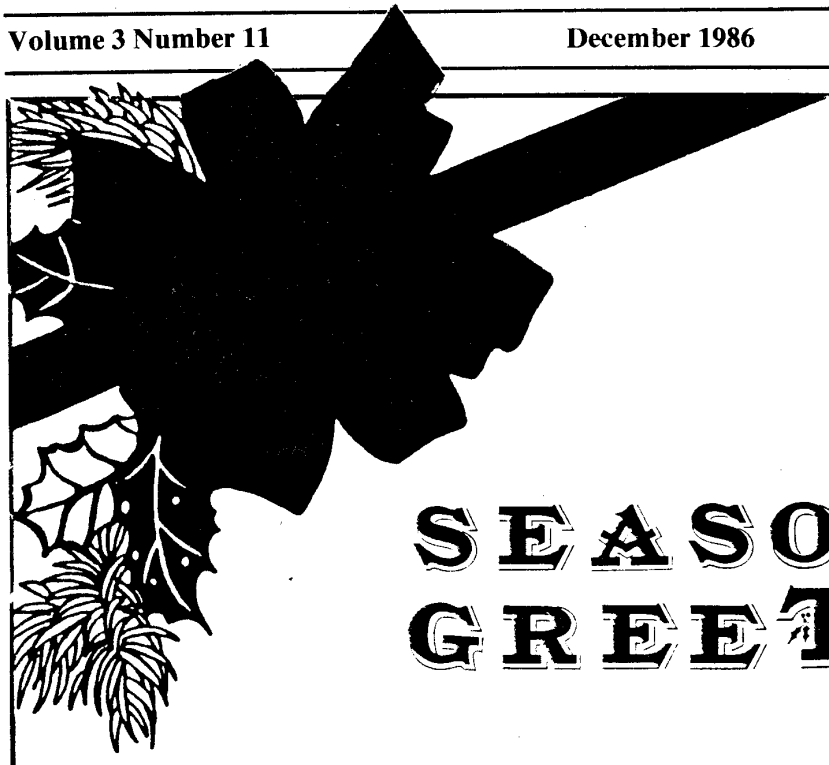

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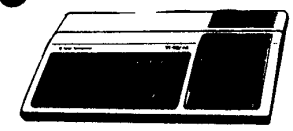

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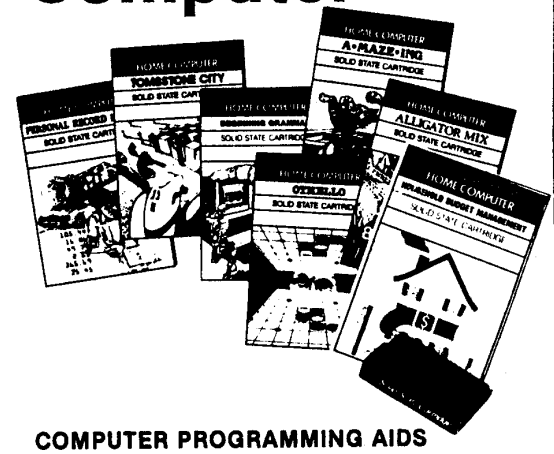

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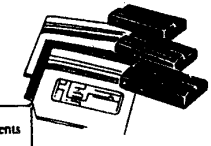

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Mack McCormick....**Technical Editor**

Coming next month

—C. Regena's BASIC column
—Review of Myarc's XBII
—More on computer graphics

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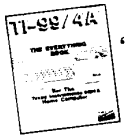

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Comments

Color for Christmas

We hope that your MICROpendium this month looks very pretty and festive with a cover sporting the cheery red denoting the holiday season.

We say "hope" because this is our first experiment with color in the pages of the magazine. If it works out, we can offer it as a continuing option to our advertisers and use it ourselves as an added touch toward making this publication more attractive.

80-COLUMN CARD

We have talked a lot about Myarc's new computer, but perhaps should not let that overshadow other goodies coming our way. Mechatronic's 80-column card is already in production and evidently already on the market in its native Germany. T.A.P.E. Ltd. in Ontario, California, has them in stock also, but they have not been sent to dealers yet.

Franz Wagenbach of T.A.P.E. explains that he has not finished translating the manual into English. He says he is waiting for material from Germany about the graphics which can be addressed with the video chip. Wagenbach says graphics are compatible with the Geneve graphics.

He notes that Monty Schmidt is working on adapting TI-Writer for the card and has a card in place with it.

The card is expected to sell for $219, Wagenbach says.

Wagenbach notes that Schmidt wrote several programs for Mechatronic's GRAM-Karte which are on disk: loaders for the Editor/Assembler and its software, for the TI-Writer cartridge and software and for the GPL Assembler. Also available is software for translating MG's GRAM Kracker to GRAM-Karte and for using the GRAM Karte as a RAM disk.

Address for T.A.P.E. Ltd. is P.O. Box 4042, Ontario, CA 91761.

USING COLUMNS WITH TI-WRITER

A reader is looking for a program that will allow editing operations to be conducted on columns, rather than rows. He would like such a utility to facilitate the use of numbers in TI-Writer documents. Being able to delete a single column of data a la Multiplan could be very useful in a word processor. Anyone with suggestions is welcomed to pass them on to us.

SALES TAX INCREASE

Fellow Texans, please note that the New Year will be bringing us an increased sales tax (a gift to you from OPEC). After Dec. 31, instead of 87 cents, add an extra $1.06 to your subcription so we can send it to the State Comptroller.

NEW COLUMNIST DEBUTS NEXT MONTH

MICROpendium will begin carrying a BASIC programming column by C. Regena (Cheryl Whitelaw in private life) starting next month. Over the years her column has been a regular feature of 99er Magazine and Compute, and we are delighted that she will continue serving the TI community via MICROpendium.

—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, Prowriter 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, QUICKCOPYer, 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
April: U.S. Open Tennis, PRBASE
May: 4A Flyer, GRAM Kracker, Artist's Companion
June: Myarc Disk Controller Card, Maximem
July: Horizon RAMdisk, Old Dark Caves, Funlwriter, TI99/4A Macro Assembler
August: JOYPAINT 99, GPL Assembler, TI99/4A INTERN, GPL Linker
September: Mechatronic 128K card
October: TI-Forth Utilities, CorComp Memory Plus
November: Submarine Commander, PEP, MAX-RLE

NEW FROM MONTY SCHMIDT:

GPL LINKER V1.1 Run Time Version

now $49.95
w/Linker $59.95
plus Intern $69.95
add $3 shipping

GPL Linker is an ingenious program that places the power of Graphics Language Programming (GPL) at your command. No extra hardware is required beyond standard 32k and disk system. In short, Linker creates runnable program files from compressed (or uncompressed) GPL Assembler object files. You can then run these programs with "Option 5 Run Program Files" of the Editor Assembler Module.
Up to 24k GPL programs can be developed and run on standard 32k systems. Included in the run time version are two demonstration programs and "CONVERT," a public domain conversion program that converts MS BASIC statements to TI BASIC statements.
Price: $21.00 CDN funds $15.00 US funds.

GPL price Reduction

ENHANCED

GPL Assembler V2.1

NØW with high memory loader package

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.

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.

MegaRam™

from ATRONIC

The only **full** megabyte (1024k) RAM memory expansion for the 99/4A has now been introduced in North America. This new stand-alone unit attaches to the I/O connector to add the standard 32k PLUS 992k of extra memory. The innovative "SUPERVISOR" program monitors memory use, RAM-DISK functions and bank-switching for application programs. MegaRam works with XB or E/A languages and other TI modules which require 32k. Compatible with virtually all TI programs. MegaRam does not come as an Expansion Box card due to the direct address line access needed.

Price: $575.95 (US) for twice the memory in this astounding product! Requires console, drive, XB or E/A.

Super Clock Support

Designed for the CorComp Clock Peripheral—Triple Tech Card or Stand-alone models. This utility package provides more functions for use in your Extended Basic programs. Direct access to the clock ROM at assembly speed gives you these features: three independent timers to set and read; alarm function; two interrupt routines to display time and date on screen with CTRL T—continuously or on your command; all time and date displays are in 12 or 24 hour format using **TEXT.** This program also allows the week, date and time to be set independently rather than all together.
Program disk is not copy protected to allow you full use in your Extended Basic programs. Package includes disk and instructions. Only $17.95 plus $2

XBII plus

As reviewed in Micropendium October 1985. This command module gives you all the features of Extended Basic PLUS 40 new commands. Totally compatible with TI's XB, this enhanced version gives your programs more power to access your 99/4A. Commands such as MLOAD, MSAVE, VPEEK, VPOKE, GPEEK are superior to most other Basic environments. Various demo programs and new applications using high resolution graphics make this module a "must" for Extended Basic users. Comes complete with a 95 page manual. Requires console and 32k. $75.00 (US) plus $2 shipping.

BASIC Compiler V1.1

New Basic Compiler that is finally easy to use! Supports virtually all Basic and Extended Basic commands in existing programs. Simply load and compile programs from a menu driven directory on your screen. No extensive re-writing, variable declarations or conversions are required. Compiler produces code-list in one pass containing all variable addresses and jump list. Package includes Extended Basic Loader, Floating Point Loader, Integer Loader, Disk Menu program and DSR program for the Compiler support. This Compiler cannot unravel DEF statements and stops on the END statement—no SUB's allowed. TRACE, BREAK, ON ERROR, CALL LOAD and CALL LINK may produce execution errors.
Requires 32k, disk. Price: $20.00 plus $2 shipping (US funds).

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Feedback

Granting a wish

Re Dennis Wood's wish no. 1 on page 8 of the November issue: You can get the Multiplan data disk to boot from drive two by going into the second sector of the MPINTR file and changing the 1 to a 2 in the ASCII mode at byte 95. Additionally, you can change your default printer option to PIO/1 by entering it at byte 196, same sector. I used Advanced Diagnostics to locate the bytes so they are decimal.

I read Bob Carmany's article on MAX-RLE and there is one feature that Bob overlooked. You can change the background and foreground colors of the picture you have loaded in accordance with the following key inputs:

	Foreground	Background
Black	SHIFT 1	1
Green Med	SHIFT 2	2
Green Lgt	SHIFT 3	3
Blue Drk	SHIFT 4	4
Blue Lgt	SHIFT 5	5
Red Drk	SHIFT 6	6
Cyan	SHIFT 7	7
Red Med	SHIFT 8	8
Red Lgt	SHIFT 9	9
Yellow Drk	A	a
Yellow Lgt	B	b
Green Drk	C	c
Magenta	D	d
Gray	E	e
White	F	f

Also there is an XB auto boot program image version now.

Joe Nuvolini
President, Front Range 99ers
Colorado Springs, Colorado

How to save program from tape to disk

Re "Program Problems" (Feedback, Nov. '86), I also had problems saving long tape programs to disk.

The way the system acts I assume the first byte of data saved to tape tells the computer the length of the program. When the program is loaded, if this length exceeds the available console memory the load attempt is aborted.

To save long tape programs to tape I turn off the system, turn off the disk drives, then turn the console back on. If the program will load into Extended BASIC I use it, otherwise I use BASIC (Extended BASIC works faster when deleting lines). Start at the top of the program list and delete about half the lines and resave the program to another tape. Now load the original tape program, remove the last half of the program listing and save it to a second tape. Turn your system off. Turn the disk drives on and turn the system on.

Load the first half of your tape program and SAVE DSK1.A,MERGE

Load the second half of the tape program, then MERGE DSK1.A

Now save the complete program to disk.

If you have a GRAM Kracker with GRAM Utility 1 loaded you can use the DEL starting line -ending line to save a lot of time.

Jerry Keisler
Paris, Texas

Others also deserving

The member of the Ottawa Users Group who presented a plaque to Lou Phillips and Myarc certainly wasn't speaking for all the TI users worldwide.

I wouldn't want to take a thing away from Lou Phillips but I can think of many others in the TI community who have supported the TI as much as or more than Mr. Phillips.

Jim Peterson stands out as one person who has offered much to our little community for very little in return. He was there in the beginning sending out his tips and really assisting many users groups with programming help, ideas and software during the early and dark days when TI made our computers orphans.

The other gentleman I would like to mention is Craig Miller who not only has produced some excellent software and information for the TI but produced an outstanding piece of hardware in the GRAM Kracker. Most of what Craig has made available for the TI can be used as learning tools as well as excellent utilities for everyday use.

Both of these men have furthered the use of our computers far beyond our dreams.

David L. Peden
El Cajon, California

Battery source listed

I was just going through some old issues of MICROpendium and was reading a couple of letters from users concerned with the battery replacement in their Mini-Memory cartridges. I also just received a sale flyer from a local surplus electronics store and they have the exact batteries needed complete with the solder tabs.

The price is very reasonable at $1.75 each in quantitities of 1-3, $1.50 for 3-9 and $1.35 for 10 and up. All these prices are in Canadian dollars.

The company is a mail order firm as well and the address is J&J Electronics, P.O. Box 1437, Winnipeg, Manitoba, Canada R3C 2Z4.

Hope this helps someone out.

Rick Lumsden
Winnipeg, Manitoba, Canada

Programming tip

BASIC programmers, please! Never ever use the capital letter I for a variable name. Why? Because "I" can easily be mistaken for the number "1" on b/w TVs causing untold confusion. Readability = maintainability.

David F. Blossom
Wilmette, Illinois

Forth word renaming called unhelpful

Howard H. Arnold's review of Mike De Frank's TI-Forth Utilities (Oct. '86) deserves some comment:

1. Key assignments of the TI-Forth editor generally conform to those of the TI-Writer and Editor/Assembler

(Please turn to Page 10)

Introducing
the greatest thing for 99/4A computer graphics since, well, the introduction of the 99/4A!

For years TI-99/4A owners have looked longingly at programs such as Printshop (R) and Newsroom (R) for Apple, Atari and Commodore computers. We all have wished we could do the things that Fontrix (R) does on the IBM PC. Well, now there is a program for the TI-99/4A that does these things, and because of the special features of the 99/4A, does a whole lot more.

Font Writer, by J. Peter Hoddie (a master programmer — author of Pre-Scan It! and system software for the Myarc Geneve computer) makes text and graphics come truly together for the first time on the 99/4A. Font Writer will combine any TI-Writer text files, TI-Artist or CSGD fonts, and TI-Artist instances the way you want them to make an otherwise drab report, letter or article come alive!

Font Writer, like TI-Writer, is more then one program. The first program in the package is Font Editor — a program that will let you edit existing TI-Artist or CSGD fonts, or create new ones from scratch. Font Editor contains an innovative editing window, dozens of powerful menu-selectable utilities, and supports even more powerful user-defined macro drawing commands for drawing often used figures with a single command. As powerful as it is, like all Asgard products it's designed to be friendly and easy-to-use. It is so flexible that you can even edit TI-Artist instances.

The real power of Font Writer, and it's most innovative part, is the Text Formatter. This program accepts standard TI-Writer files with virtually every imbedded text formatting command supported by TI-Writer, along with many new such commands for graphics support, to allow you to integrate text fully with graphics easily. Text Formatter accepts new commands for printing text in different fonts, including pictures and other graphics, and more. This easy-to-use program is as simple to use as TI-Writer, yet does so much more.

The last, but not in any way least program in the Font Writer package is a powerful organization tool for graphics files. If you have ever tried ordering and maintaining TI-Artist fonts, slides, instances and pictures, you will later wonder why you ever tried without it.

Font Writer requires Extended BASIC, 32K, and a disk drive system. TI-Writer and TI-Artist are highly recommended. Extensive documentation by Walter Howe is included. Available for a suggested price of $24.95 from official Asgard Software dealers, from Teledata*Guide on Compuserve (page TDG-4), by sending Source Mail to TI9720 on Source, or directly from Asgard. All major credit cards accepted.

Asgard Software

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Rockville, MD 20850

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Feedback

(Continued from Page 8)

editors, i.e., FCT-9 = ESCAPE, FCT-4 (roll down) = next screen, FCT-6 (roll up) = previous screen, etc. They are at least as logical as those chosen by Mr. De Frank. Every 99/4A sold included several blank overlay strips. The easiest way to become familiar with function key assignments (for any program) is to prepare one of the blanks accordingly, not by switching them around. The manual lists them on page 5 of chapter 3.

2. The author claims a WORD TAB feature as one of the "helpful additions" provided by Mr. De Frank. TI's editor also includes that feature (both forward and reverse by CTRL-9 and FCT-9, respectively). Let's give credit where it is due. The TI editor does fall short in two areas, i.e., lack of autorepeat keys and inability to move more than one line at a time. For the former, several fixes have been published over the years and I am using an editor (by Michael Jaegermann of the Edmonton, Alberta, Users Group) which remedies the latter.

3. Is it really "helpful" to a beginner to rename standard words? I sincerely doubt it. A beginner, trying to learn Forth, is already sufficiently confounded by the differences between TI's implementation and whatever is found in a textbook. Though TI did not stray too far from fig-Forth, they felt it necessary to include an appendix (C in the manual) to point out the deviations from fig-Forth as used by Leo Brodie in *Starting Forth*. BYE (instead of MON) is logical only to the extent that it is used for the same purpose in XBASIC. If one accepts that logic, GO (for GOTOXY) does not make any sense. AT would seem a far more logical choice and, in fact, has been used for years by those who confess to being allergic to GOTOXY.

I am not questioning the usefulness of Mr. De Frank's utilities. His floating point routine sounds like a definite improvement. The others mentioned in this article have been around in one version or another for some time and are in the public domain; thus, his asking price seems a bit steep. I also do not question anyone's right to rename any Forth word to his/her liking. What I do question is whether it serves a useful purpose and whether it deserves to be touted as being "helpful." My own experience indicates the answer is "No."

Lutz Winkler
San Diego, California

Use Funlwriter with CorComp 512K card

It has been four months now since I got the CorComp 512K card. In the October issue of MICROpendium Scott Darling did a review of the card and one point he didn't make clear to me was the ease of switching the drive number the RAMdisk answers to:

There are two ways of doing this. One is to type in immediate mode:
DELETE "SD.n"
"n" being the number of the drive you wish the RAMdisk to emulate. The actual drive (if there is a floppy drive answering to that number) is disabled only until you decide to name the RAMdisk something else. The best part is that, no matter what you call the RAMdisk, the files are still there! The other method is equally simple. Just select the drive (RAMdisk) number from the RAM manager.

I felt that the ease of changing the RAMdisk number is important for others to know. Before I installed the card in my system I was worried that I would need to physically change one of my drives to answer to another number. That could be inconvenient.

The fairware program that I use the most is Funlwriter version 3.3. When I first got the 512K card I was very disappointed to realize that it would not run from the RAMdisk. Thanks to Woody Wilson finding the documentation explaining how to modify the load to accept a RAMdisk that is the one program that you will always find in residence on my card.

The fix was very easy. All I did was add an "R" in line 250:

```
250 CALL LOAD(16376,70,78,76,87,69,66
,231,170):: CALL LOAD(8196,63,248):: K
=1 :: CALL LINK("FNLWEB",K,"
R",EDPR$,FRPR$,OP$())
```

With that one-letter addition you can run Funlwriter regardless of what number drive it is answering to, because no matter what number the RAMdisk is answering to, it always answers to DSKR.FILENAME! On my file disk I have a one-line load program that simply states "10 RUN "DSKR.LOAD".

With Funlwriter on the RAMdisk, I would give the 512K card a rating of A+!

Lee E. Pierce
Lakeside, California

Provide backups

I have been reading, with much interest, the continuing discussion about pirating, hacking and backup disks. Has it ever occurred to anyone that with the price of good quality disks down to about a quarter apiece, it would be practical for the software vendors to provide a backup copy with the original sale?

Most of us in our users group strongly object to pirating, but we are just far enough from civilization that we dare not be too adventurous without backup copies. It may interest some producers to know that we would pay a little more to get duplicates of especially good and well-protected programs.

Roy West
Lexington, North Carolina

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.

New RAPID COPY

If your tired of waiting for your disk manager to copy or format your disks, Rapid Copy is here to help you. Rapid Copy is the only turbo copier specifically designed to take full advantage of the Myarc, CorComp, and Texas Instruments disk controller cards.

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Rapid Copy is simple to use, fully menu driven, and allows a multitude of copy and format options. Not only is Rapid Copy endorsed by Myarc Inc. for use with its disk controller card, a new modified version of the Myarc disk manager (included) allows you to load it from within its utility option for your convenience!

Rapid Copy is available for only $14.95. Requires 32K memory expansion, disk drive system consisting of at least one floppy disk drive, and either the Extended Basic, Editor/Assembler, or TI-Writer command module.

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Since CSGD III is a continuation of the CSGD series (created by Dave Rose), all previous CSGD graphics libraries are compatible with it. Thus, CSGD III is already a fully supported software package; over 80 fonts and 280 small graphics are presently available.

The complete three disk package comes complete with 25 fonts, 40 small graphics, extensive documentation, for only $17.95. CSGD III requires a disk system, 32K memory expansion, TI Extended Basic, and either an Epson or Prowriter graphics compatible printer (specify your printer type when ordering). Simply an outstanding value, order yours today!

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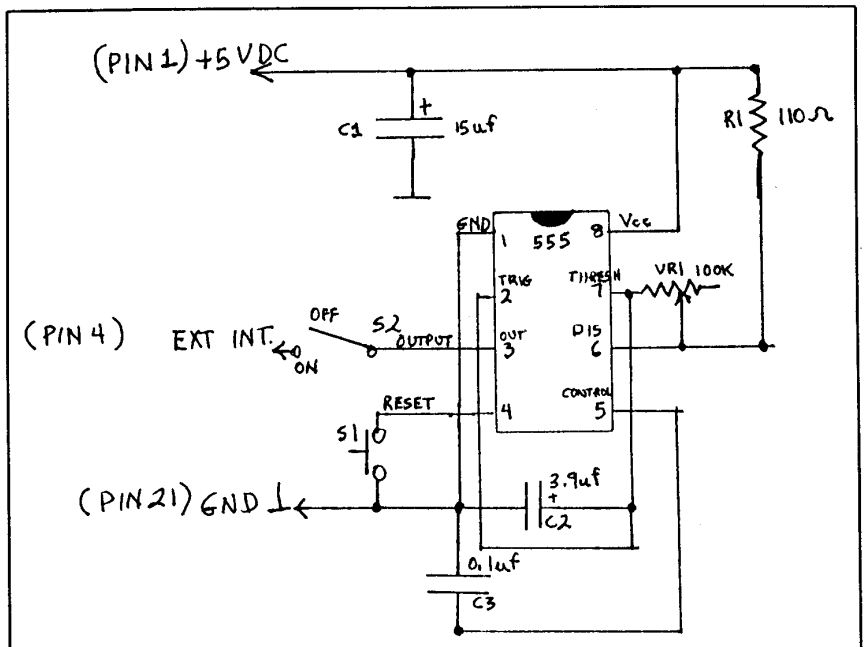
Slooow Down —your TI

By MACK McCORMICK
Technical Editor

I can hear everyone now! Why in the world would anyone want to slow down his computer? I couldn't agree more and therefore usually spend a substantial amount of time trying to speed things up. In fact, that was one of my main reasons for learning assembly language.

And so begins our first in a series of hardware articles. I assure you they will get much more involved after this one, but this is intended to ease you into reading circuit diagrams and understanding basic electronics.

The circuit described here slows down everything the computer does as long as interrupts are enabled by the running program (such as in BASIC or Extended BASIC). Using this circuit, you may watch your title or program screens being built in slow motion. The beep as the computer powers up can be excruciatingly long. All this is controlled by a simple circuit in which the time delay can be varied or even frozen with the press of a button. Examine Figure 1, and I'll briefly describe what is going on in our one chip circuit.



Parts List

IC Ne555 or 7555 chip
R1 110 ohm ¼ watt resistor
VR1 100K ohm potentiometer
C1 15mf 10 volt electrolytic capacitor
C2 3.9mf 10 volt electrolytic capacitor
C3 0.1mf 10 volt capacitor
S1 Single pole momentary contact mini-switch
S2 Single pole single throw mini-switch
Suitable knob, perf circuit board, socket if desired

HOW IT WORKS

This is your basic NE555 timer chip which is set up to periodically provide a zero logic pulse to the external interrupt pin of the TMS9900 microprocessor (CPU) chip of the TI99/4A. This effectively suspends processing as long as it is at logic zero. These periodic interrupts serve to really slow down the executing program, in effect providing slow effect.

All of this is made possible with a mere eight parts. Capacitor C1 simply filters the incoming +5 volt power to reduce any unwanted signals from the rest of the computer. R1 establishes the minimum delay time and in conjunction with VR1 and C2 comprises a RC timing circuit to determine the delay prior to the 555 flip-flopping. Capacitor C3 provides a reference voltage for the control gate. Switch S1 places the reset pin low when pressed and causes the output to go low thereby generating an interrupt. Switch S2 connects the timer to the interrupt pin of the computer. The timer circuit operates whether or not it is connected.

BUILDING THE CIRCUIT

I built the entire circuit on a piece of perforated circuit board about an inch square and housed it in my speech synthesizer. It took less than an hour.

I suppose this is a good place to ask for your assistance. I need a source of perforated circuit boards with edge connectors suitable for the Peripheral Expansion Box (30 contacts per side at 0.10 inch spacing for an Attleboro connector.) We'll need these for future projects. I've been using my speech synthesizer and my single step card for everything I've built so far. Without your help in locating a source I'll either have to stop the hardware series soon

(See Page 14)

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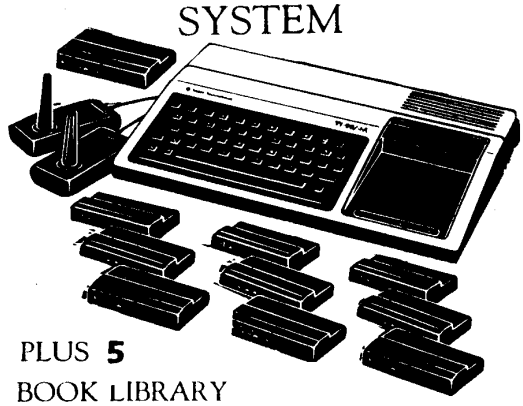

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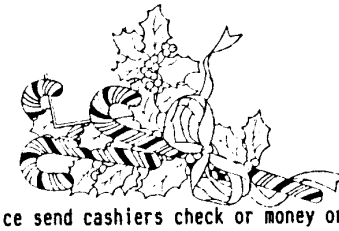

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TIMER CHIP—

(Continued from Page 12)

or contract to have some boards etched and sell them. I'd prefer to buy ones which are already available.

There are only three wires to connect to your speech synthesizer, plus three holes to drill for mounting the two switches and the potentiometer. Take your time when connecting the wires and remember that the odd numbers are on the underside and the even numbers are on the top.

After everything is assembled ensure you have made all the connections properly and have no solder bridges (short circuits). If you use a 7555 CMOS IC instead of the NE555 be especially cautious to avoid static damage to the chip while handling. Ensure you are well-grounded when installing the chip.

The parts used in this circuit project should be available from your local Radio Shack or electronic supply store.

TESTING

Load your favorite BASIC program with graphics and turn on the slow motion circuit. Immediately you should see the cursor slow down. You can vary the speed with the potentiometer and freeze it with the push button. RUN the program and you should be able to see your graphics built in slow motion. If it doesn't work check your wiring and, with a voltmeter, check your supply voltages at pin 8 for +5 volts. If all else fails, there's usually at least one member of a local user group who is into electronics who may be able to offer help.

I've purposely not gone too much into detail on how the circuit works to keep things simple for this first time out. Also, because the circuit is so simple, I have not described in great detail how to connect the wires together. Remember, only make a connection where there is a dot when the wires cross one another.

I would appreciate a brief note from those of you who would like more hardware articles and let me know if you had difficulty understanding this article.

Until next time, don't sniff too many solder fumes.

Readers may write Mack at HHC, 1ST INF DIV(FWD), APO NY 09137. Anyone with information on a source for the circuit boards described by Mack may contact MICROpendium. We will publish this information and forward it to Mack.

E.T. 99ers announce meeting schedule

The E.T. 99er Club meets the second Saturday of each month at Mercury Savings and Loan in El Toro, California, according to Mike McCasline, vice president of the group.

Meetings are from 9 a.m. until noon. Mercury Savings and Loan is at the corner of IH 5 (San Diego Freeway and Lake Forest.

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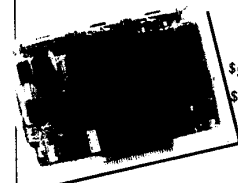

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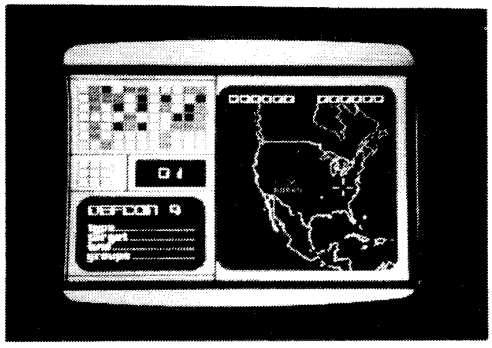

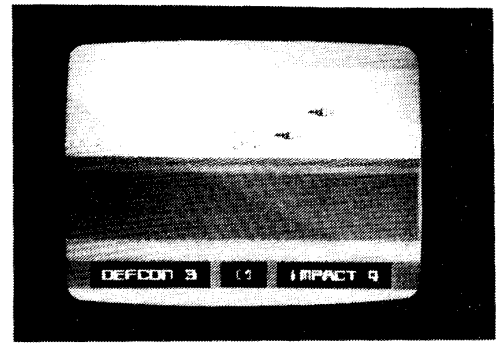

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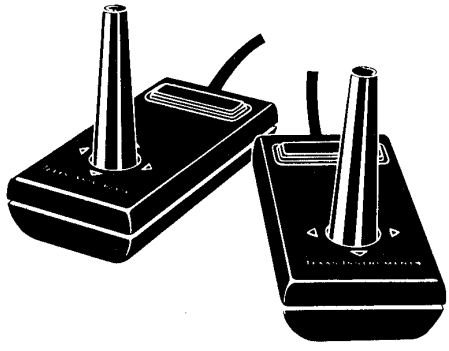

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Adding auto-repeat to Forth

By KURT R. ELLIOTT

Let me begin by stating that I am not an accomplished Forth programmer. I began working with Forth only a few months ago, but I have been swayed away from programming in BASIC.

What I will present here is not, I am sure, the best solution. But it is a short and straightforward answer that does what it was meant to do.

When I started working with Forth, it was with the Wycove version. My main reason for this was that the Wycove Forth editor has auto-repeat keys. This, to me, is paramount in *any* editor. And the fact that the TI Forth editor did not have auto-repeat took a lot away from a very powerful editor. So on to the solution.

Screen 38 is still basically the same, but a few changes have been made, causing lines 11, 12 and 13 to be somewhat cluttered. I tried to keep screen No. 38 all on the same screen in order to save disk space. Only one extra screen (empty on the system disk) has been used so that the editor boots in very little extra time.

The word KEY in line 2 has been changed to ?KEY to allow the routine to continue even if no key has been pressed. The IF in line 2 causes the key check portion of VED to be bypassed if no key has been pressed. Execution continues after ELSE in line 13.

Screen No. 41 contains the cursor control word BLINK and the auto-repeat speed word CSPEED. By increasing the value of the loop limit in CSPEED, the auto-repeat is slowed down. By decreasing the value, the repeat speed is increased. Caution must be used not to decrease this value too far as this also decreases the amount of time you can press a key before it repeats. Too low a value can result in a lot of extra characters being typed. BLINK has been designed so that it can be used in other applications. A timer must be on the stack when BLINK is entered. BLINK is used twice in VED on screen 38. In line 13, when no key has been pressed, BLINK is entered with a timer of 0. This causes the cursor to blink extremely fast.

In line 12, when a key has been pressed, BLINK is entered with a timer of 12C hex, causing the cursor to be displayed for a longer period. The reason for this is that if the cursor blinks too fast when a key is repeating, the faster scan does not have enough time to display the cursor. Line 4 of screen 41 fetches the cursor position and the screen width and does a modular division, leaving the column

(See Page 18)

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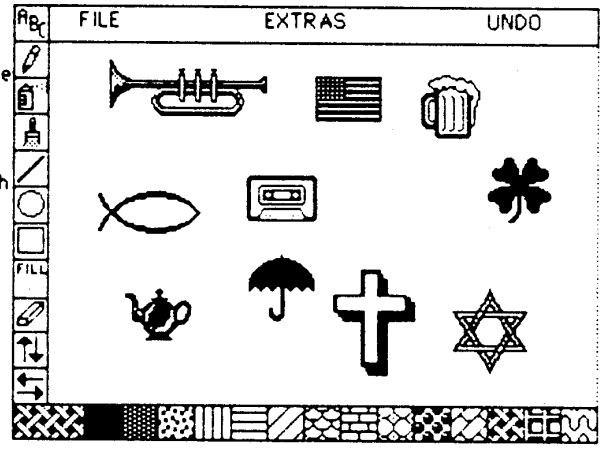

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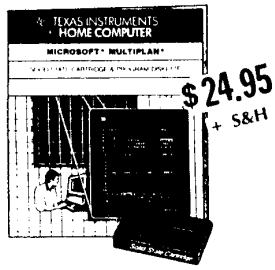

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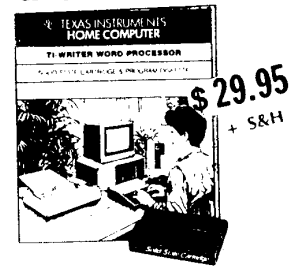

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AUTO-REPEAT—

(Continued from Page 16)

and row positions of the cursor needed for GOTOXY. Lines 5 and 6 load the stack for all the operations except the cursor character display. Line 7 shows the stack after loading. Line 8 displays the cursor. Line 9 is the display (timer) loop. Line 10 resets the cursor position (incremented by EMIT) and displays the original character. Line 11 again resets the cursor position.

And that's it. The delay before repeating is the same as during repeating. It is not a big deal to me, but some people may want a longer delay before repeating. Also, you may want to spread out screen 38 over two screens to make it a little more readable. If someone has a question about these words or about Forth in general, feel free to write me: Kurt R. Elliott, 428 Glasgow St., Pottstown, PA 19464.

```
SCR #38
  0 ( SCREEN EDITOR 12JUL82 LCT - AUTO-RPT KEY ADDED 17JUN86 KRE )
  1  BASE->R HEX 29 CLOAD CSPEED
  2 : VED BOX SWAP CLS LISTL !CUR .CUR BEGIN ?KEY DUP IF CASE
  3   0F OF BCK              ENDOF  01 OF DELHALF BLNKS RELINE ENDOF
  4   08 OF -1 +.CUR         ENDOF  02 OF +SCR                 ENDOF
  5   0A OF C/L +.CUR        ENDOF  0C OF -SCR                 ENDOF
  6   0B OF C/L MINUS +.CUR ENDOF   03 OF DEL RELINE          ENDOF
  7   09 OF 1 +.CUR          ENDOF  04 OF INS RELINE           ENDOF
  8   0D OF 1 +LIN .CUR      ENDOF  07 OF DELLIN REDRAW        ENDOF
  9   0E OF FLIP             ENDOF  06 OF INSLIN REDRAW        ENDOF
 10   1E OF INSLIN BLNKS REDRAW ENDOF 16 OF TAB              ENDOF
 11   7F OF -TAB ENDOF       DUP 1F > OVER 7F < AND
 12  IF DUP EMIT DUP !BLK ELSE 7 EMIT ENDIF ENDCASE 12C BLINK CSPEED
 13        ELSE BLINK ENDIF AGAIN ; FORTH DEFINITIONS
 14 : WHERE EDITOR1 B/SCR /MOD SWAP B/BUF * ROT + 2- VED ;
 15 : EDIT EDITOR1 0 VED ;  : ED@ EDITOR1 SCR @ EDIT ; R->BASE

SCR #41
  0 ( CURSOR CONTROL FOR AUTO-REPEAT KEY EDITOR 17JUN86 KRE )
  1 0 CLOAD CSPEED BASE->R DECIMAL
  2
  3   : BLINK ( timer --- )
  4       CURPOS @ SCRN_WIDTH @ /MOD  ( timer col row --- )
  5       ROT >R DUP >R SWAP DUP ROT SWAP  ( * these two lines * )
  6       CURPOS @ VSBR R> ROT SWAP R>     ( * load the stack  * )
  7       ( col row char col row timer --- )
  8       30 EMIT ( cursor character )
  9       0 DO LOOP ( cursor display timer )
 10       GOTOXY EMIT ( reset cursor pos, display real character )
 11       GOTOXY ;  ( reset cursor position )
 12
 13   : CSPEED 1600 ^O   DO  LOOP ;
 14
 15 R->BASE
```


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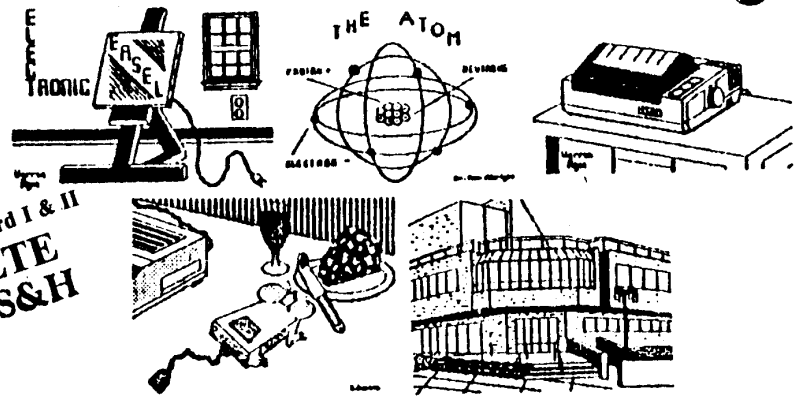

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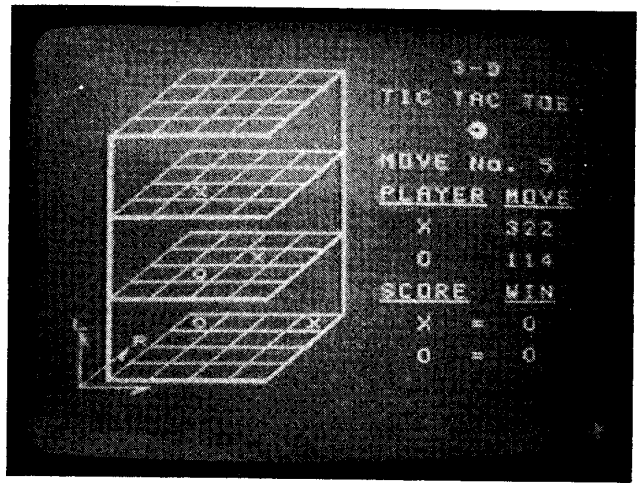

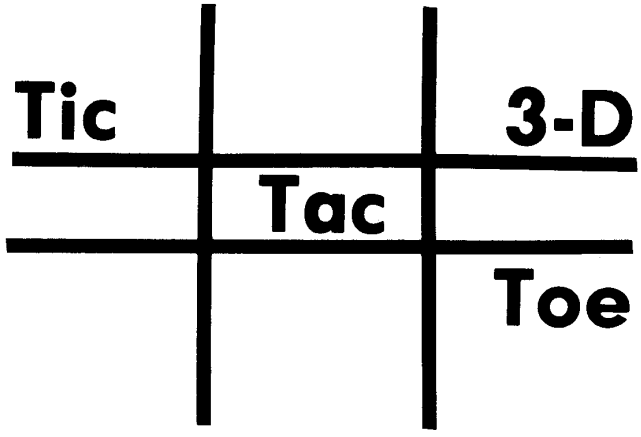

Looking for a challenging game of Tic-Tac-Toe? You need go no further than this version of 3D Tic-Tac-Toe by Rick and Jill Pelly of Huntington Beach, California. The program was written in 1985 and was published this summer in ROM, the newsletter of the Users Group of Orange County, Fountain Valley, California.

This is the first game published in MICROpendium, and we're printing it because we enjoyed it. We've held off publishing game programs because we're not sure whether they're worth the space it takes to print them. Generally, a game listing will take up three or four pages, and that's a lot in a publication the size of MICROpendium. Whether this will be the last game we publish will depend on our readers. Let us know whether you want more, and we'll see what we can do.

3D Tic-Tac-Toe requires Extended BASIC and a memory expansion. Although it will load into console memory, it won't run. (Tightening up the code would probably allow it to load and run out of a console. Leaving out the instructions in lines 140-160 might be enough to do the trick.)

The game is easy to play, with locations of Xs and Os based on coordinates. The bottom level is 1, the middle level 2 and the top level 3. Rows are numbered 1, 2 and 3 on each level and columns are similarly number. To place an X on level 1 at row 1, column 1, enter 111. And so on.

```
10 !
20 ! 3-D TIC-TAC-TOE
30 ! BY
40 ! RICK & JILL PELLY
50 !
60 ! HUNTINGTON BEACH, CA
70 ! VERSION 5.0 XB
80 !
90 !
100 CALL SCREEN(5)
110 FOR A=0 TO 14 :: CALL COLOR(A,16,5):: N
EXT A
120 CALL CLEAR
130 PRINT "              3-D":"":"":"
  TIC-TAC-TOE":"":"":"":
140 PRINT "THE GAME IS TIC-TAC-TOE IN A4X4X
4 CUBE. EACH MOVE IS IN-DICATED BY A 3 DIGI
T NUMBER,WITH EACH DIGIT BETWEEN 1"
150 PRINT "AND 4 INCLUSIVE. THE DIGITS INDI
CATE THE LEVEL, COLUMN, AND ROW RESPECTIVEL
Y OF THE OCCUPIED PLACE.":"":
160 PRINT "TO STOP THE PROGRAM TYPE 0  AS Y
OU MOVE.  THE COMPUTER  CAN TAKE UP TO 90 S
ECONDS   TO MAKE A MOVE."
170 PRINT "(LOADING...   PLEASE WAIT.)"
180 OPTION BASE 1
190 DIM X(64),G(76),M(76,4),Y(32)
200 FOR I=1 TO 32
210 READ Y(I)
220 NEXT I
230 FOR I=1 TO 76
240 FOR J=1 TO 4
250 READ M(I,J)
260 NEXT J
270 NEXT I
280 SCRX=0 :: SCRO=0
290 CALL CHAR(97,"FF00000000000000")
300 CALL CHAR(98,"0102040810204080")
310 CALL CHAR(99,"FF0204081020408O")
320 CALL CHAR(100,"FF03060C183060C0")
330 CALL CHAR(101,"8080808080808080")
340 CALL CHAR(102,"0303030303030303")
350 CALL CHAR(103,"FFFF000000000000")
360 CALL CHAR(105,"00FF000000000000")
370 CALL CHAR(104,"FFFF000000000OFF")
380 CALL CHAR(106,"03030000FF000000")
390 CALL CHAR(107,"FFFF0000FF000000")
400 CALL CHAR(113,"FFFF0000FF3C70C0")
410 CALL CHAR(109,"FFFF001F3030301F")
420 CALL CHAR(110,"0303070B13234383")
430 CALL CHAR(117,"0002060C1C385888")
440 CALL CHAR(112,"111214181F000000")
450 CALL CHAR(115,"1010101010101010")
460 CALL CHAR(116,"00101818lC1C1612")
470 CALL CHAR(120,"FFFFBBD7EFD7BBFF")
480 CALL CHAR(119,"FFFFC7BBBBBBC7FF")
490 CALL CHAR(143,"38101F999FF8081C")
```

(See Page 22)

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- TI 9995 Processor Chip - 12 MHz
  256 Bytes ULTRA High Speed on Chip RAM
  Pre-fetch on Instructions
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- More RAM Memory than any machine in its price class

For further information, contact your nearest dealer.
If unknown, contact MYARC (201) 766-1700 for dealer information.

3D TIC-TAC-TOE—

(Continued from Page 20)

```
500 CALL CHAR(118,"8000000000000000")
510 CALL CHAR(121,"FF00442810284400")
520 CALL CHAR(122,"FF00384444443800")
530 CALL CHAR(123,"3C66E7E7E7FF7E3C")
540 CALL CHAR(124,"3C7EFFE1E1FF7E3C")
550 CALL CHAR(125,"3C7EFFE7E7E7663C")
560 CALL CHAR(126,"3C7EFF8787FF7E3C")
570 CALL CHAR(96,"3C7EFFFFFFFF7E3C")
580 CALL CLEAR
590 DISPLAY AT(1,21):"3-D"
600 DISPLAY AT(2,6):"bacacacade"
610 DISPLAY AT(3,5):"bacacacadve TIC TAC TO
E"
620 DISPLAY AT(4,4):"bacacacadv e"
630 DISPLAY AT(5,3):"bacacacadv  e"
640 DISPLAY AT(6,2):"fgggggggv   e"
650 DISPLAY AT(7,2):"f   bacacacade MOVE No
."
660 DISPLAY AT(8,2):"f  bacacacadve"
670 DISPLAY AT(9,2):"f bacacacadv e PLAYER
MOVE"
680 DISPLAY AT(10,2):"fbacacacadv  e iiiiii
 iiii"
690 DISPLAY AT(11,2):"fgggggggv   e   X"
700 DISPLAY AT(12,2):"f   bacacacade"
710 DISPLAY AT(13,2):"f  bacacacadve   O"
720 DISPLAY AT(14,2):"f bacacacadv e"
730 DISPLAY AT(15,2):"fbacacacadv  e SCORE
 WIN"
740 DISPLAY AT(16,2):"fgggggggv   e iiiii
 iii"
750 DISPLAY AT(17,1):"lf   bacacacadv   X
="
760 DISPLAY AT(17,24):SCRX
770 DISPLAY AT(18,1):"tf rbacacacadv"
780 DISPLAY AT(19,1):"sfubacacacadv     O
="
790 DISPLAY AT(19,24):SCRO
800 DISPLAY AT(20,1):"snbacacacadv"
810 DISPLAY AT(21,1):"pjkqgggggv"
820 DISPLAY AT(22,1)
830 DISPLAY AT(23,1)
840 DISPLAY AT(24,1)
850 CALL HCHAR(24,31,143)
860 CT=0
870 FOR I=1 TO 64
```

(See Page 24)

SUPPORT!

For JOY PAINT '99!

JOY PAINT'S PAL

JOY PAINT'S PAL is a companion PROGRAM that allows users of JOY PAINT to use graphics screens created by other programs! Also gives the ability to EDIT PATTERNS and REDUCE OBJECTS! Includes a print routine for the AXIOM GP-100 TI..... $9.95 POSTPAID!

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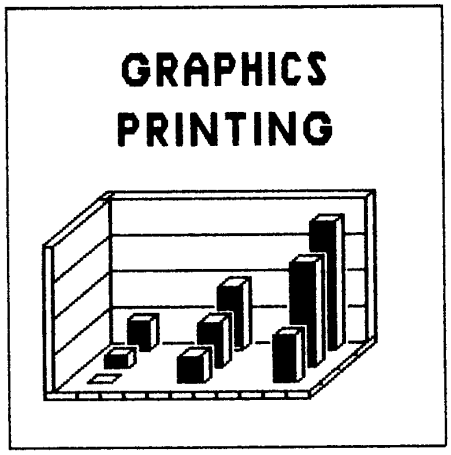
tpa

Number 1 McCann Software News December 1986

THE PRINTER'S APPRENTICE

Well old Leonardo could have saved all the green he paid for that XROCKS desktop publishing outfit he bought and used the cash to take Mona out on the town if he had just hired THE PRINTER'S APPRENTICE.

Leo is creative but practical so he always has his books and major reports printed at Gutenberg's What he needs is a tool for expressing his creativity in ads, cards, menus, newsletter pages and the church bulletin. THE PRINTER'S APPRENTICE lets him do that at home on his 99/4A. Besides, do you think Mona's gonna put together all those fancy pages on the XROCKS on what he pays?



With THE PRINTER'S APPRENTICE you get a "fat pixel" graphics type character editor with word processing like editing for creating fonts like this NLQ font you are reading. You get a picture editor for clipping, drawing or editing new or existing artwork. TI-Writer text files are transformed into microjustified and hyphenated text graphics in your choice of font with our formatter. Finally, our scheduler program puts all the pieces together, like we have with this ad. Don't you agree?

FONTS BY CYNTHIA

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TPA AMERICANA

TPA BOLD TPA BOLD

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A SMALL PRICE TO PAY

THE PRINTER'S APPRENTICE	22.50
BUSINESS GRAPHS 99	15.95
TPA FONTS DISK ONE	11.50

This ad was completely created using only THE PRINTER'S APPRENTICE, Copyright 1986 Mike McCann all rights reserved. Requires 32K, Disk System and either E/A or Extended BASIC. To order send check or money order to McCann Software P.O. Box 34160 Omaha, NE 68134.

3D TIC-TAC-TOE—

(Continued from Page 22)

```
880 LET X(I)=0
890 NEXT I
900 LET Z=1
910 DISPLAY AT(23,1)BEEP:"DO YOU WANT TO MO
VE FIRST?"
920 ACCEPT AT(21,14)VALIDATE("NOYES"):S$
930 IF S$="NO" THEN 2080
940 IF S$="N" THEN 2080
950 IF S$="YES" THEN 1020
960 IF S$="Y" THEN 1020
970 DISPLAY AT(22,1)BEEP:"INCORRECT RESPONS
E!"
980 DISPLAY AT(23,1)BEEP:"DO YOU WANT TO MO
VE FIRST?"
990 DISPLAY AT(24,1):"PLEASE TYPE ""YES"" O
R ""NO""."
1000 GOTO 920
1010 DISPLAY AT(20,17)
1020 DISPLAY AT(21,14)
1030 DISPLAY AT(23,1)
1040 DISPLAY AT(24,1)
1050 CT=CT+1
1060 DISPLAY AT(23,1)BEEP:"YOUR MOVE."
1070 ACCEPT AT(11,24)VALIDATE(DIGIT)BEEP:J1
1080 DISPLAY AT(21,14)
1090 DISPLAY AT(22,1)
1100 DISPLAY AT(23,1)
1110 DISPLAY AT(24,1)
1120 IF J1<>0 THEN 1140
1130 GOTO 2440
1140 IF J1<111 THEN 3530
1150 IF J1>444 THEN 3530
1160 I=0
1170 I=I+1
1180 LET JJ(I)=VAL(SEG$(STR$(J1),I,1))
1190 IF JJ(I)<1 THEN 3530
1200 IF JJ(I)>4 THEN 3530
1210 IF I<3 THEN 1170
1220 DISPLAY AT(7,25):CT
1230 GOSUB 3470
1240 LET K1=INT(J1/100)
1250 LET J2=(J1-K1*100)
1260 LET K2=INT(J2/10)
1270 LET K3=J1-K1*100-K2*10
1280 LET Q=16*K1+4*K2+K3-20
1290 ROW=25-((K1*5)+(K3-1))
1300 COL=4+((K2*2)+(K3-1))
1310 IF X(Q)=0 THEN 1340
1320 DISPLAY AT(22,1)BEEP:"THAT SQUARE IS U
SED."
```

(See Page 26)

SST Expanded Basic Compiler
$25.00

With Graphics and Text Mode
$35.00

NEW VERSION
The new compiler system now compiles and loads programs almost 3 times faster (some have been compiled up to 5 times faster).

REVIEW - The Compiler received an excellent rating for performance and documentation in a review in the HOME COMPUTER MAGAZINE, Sept., 1984.

The Compiler translates Basic programs into TMS 9900 machine language. It contains most of the features of Extended Basic plus many others. Requires memory expansion, disk, E/A or MM module.

PRE/SST PROGRAM - $30.00
Facilitates preparing existing programs for processing by the SST Compiler. Makes developing new programs easier. Requires extended Basic and memory expansion.

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   Varies according to monitor.
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Creates test patterns for monitor and TV alignment.

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Our own version of "supercart".

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Exact replacement battery.

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SAN DIEGO, CA 92103
(619) 295-3301

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3D TIC-TAC-TOE—

(Continued from Page 24)

```
1330 GOTO 1060
1340 LET X(Q)=1
1350 CALL HCHAR(ROW,COL,121)
1360 DISPLAY AT(21,14)
1370 IF CT<5 THEN 2080
1380 GOSUB 2620
1390 J=1
1400 I=1
1410 IF J=1 THEN 1480
1420 IF J=2 THEN 1590
1430 IF J=3 THEN 1770
1440 I=I+1 :: IF I<=76 THEN 1410
1450 GOSUB 3560
1460 J=J+1 :: IF J<=3 THEN 1400
1470 GOTO 2240
1480 IF G(I)<>4 THEN 1440
1490 DISPLAY AT(22,1)BEEP:"YOU WIN AS FOLLO
WS"
1500 FOR J=1 TO 4
1510 LET Q=M(I,J)
1520 GOSUB 2540
1530 DISPLAY AT(ROW,COL-2)SIZE(1)BEEP:"x"
1540 DISPLAY AT(23,5*J-4)BEEP:"(";STR$(Q);"
)"
1550 NEXT J
1560 SCRX=SCRX+1
1570 DISPLAY AT(17,24):SCRX
1580 GOTO 2430
1590 IF G(I)<>15 THEN 1440
1600 FOR J=1 TO 4
1610 LET Q=M(I,J)
1620 IF X(Q)<>0 THEN 1660
1630 LET X(Q)=5
1640 GOSUB 2540
1650 DISPLAY AT(13,23)BEEP:Q
1660 NEXT J
1670 DISPLAY AT(22,1)BEEP:"COMPUTER WINS AS
 FOLLOWS"
1680 FOR J=1 TO 4
1690 LET Q=M(I,J)
1700 GOSUB 2540
1710 DISPLAY AT(ROW,COL-2)SIZE(1)BEEP:"w"
1720 DISPLAY AT(23,5*J-4)BEEP:"(";STR$(Q);"
)"
1730 NEXT J
1740 SCRO=SCRO+1
1750 DISPLAY AT(19,24):SCRO
1760 GOTO 2430
1770 IF G(I)<>3 THEN 1440
1780 DISPLAY AT(22,1)BEEP:"NICE TRY."
1790 FOR J=1 TO 4
1800 LET Q=M(I,J)
1810 IF X(Q)<>0 THEN 1890
1820 LET X(Q)=5
1830 GOSUB 2540
1840 CT=CT+1
1850 DISPLAY AT(7,25):CT
1860 DISPLAY AT(13,23)BEEP:Q
1870 DISPLAY AT(ROW,COL-2)SIZE(1)BEEP:"z"
1880 GOTO 1050
1890 NEXT J
1900 GOTO 2240
1910 I=1
1920 LET G(I)=X(M(I,1))+X(M(I,2))+X(M(I,3))
+X(M(I,4))
1930 LET U=G(I)
1940 IF U<2 THEN 2010
1950 IF U>=3 THEN 2010
1960 IF U>2 THEN 3210
1970 FOR J=1 TO 4
1980 IF X(M(I,J))<>0 THEN 2000
1990 LET X(M(I,J))=1/8
2000 NEXT J
2010 I=I+1 :: IF I<=76 THEN 1920
2020 GOSUB 2620
2030 I=1
2040 IF G(I)=1/2 THEN 3340
2050 IF G(I)=1+3/8 THEN 3340
2060 I=I+1 :: IF I<=76 THEN 2040
2070 GOTO 2800
2080 DISPLAY AT(21,14)
2090 W=0
2095 RANDOMIZE
2100 Z=INT(32*RND)+1
2110 W=W+1
2120 IF X(Y(Z))=0 THEN 2200
2130 IF W>3 THEN 2150
2140 GOTO 2100
2150 LET Z=1
2160 IF X(Y(Z))=0 THEN 2200
2170 LET Z=Z+1
2180 IF Z<>17 THEN 2160
2190 GOTO 2710
2200 LET Q=Y(Z)
2210 LET X(Q)=5
2220 GOSUB 2540
2230 GOTO 1840
2240 REM
2250 I=1
2260 LET G(I)=X(M(I,1))+X(M(I,2))+X(M(I,3))
+X(M(I,4))
2270 LET U=G(I)
2280 IF U<10 THEN 2350
2290 IF U>=11 THEN 2350
2300 IF U>10 THEN 3210
2310 FOR J=1 TO 4
2320 IF X(M(I,J))<>0 THEN 2340
2330 LET X(M(I,J))=1/8
```

(See Page 28)

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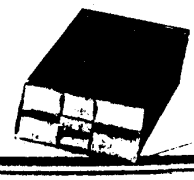

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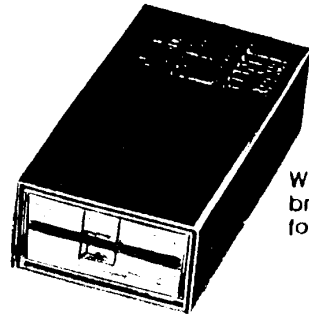

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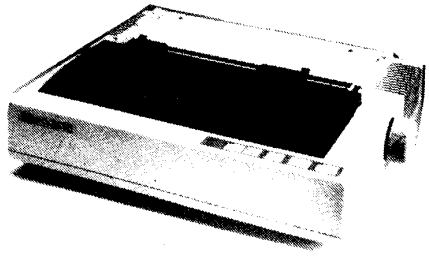

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3D TIC-TAC-TOE—

(Continued from Page 26)

```
2340 NEXT J
2350 I=I+1 :: IF I<=76 THEN 2260
2360 GOSUB 2620
2370 I=1
2380 IF G(I)=.5 THEN 3340
2390 IF G(I)=5+3/8 THEN 3340
2400 I=I+1 :: IF I<=76 THEN 2380
2410 GOSUB 3470
2420 GOTO 1910
2430 REM
2440 DISPLAY AT(24,1)BEEP:"DO YOU WANT TO P
LAY AGAIN?"
2450 ACCEPT AT(20,14)VALIDATE("NOYES")BEEP:
X$
2460 IF X$="YES" THEN 600
2470 IF X$="Y" THEN 600
2480 IF X$="NO" THEN 3550
2490 IF X$="N" THEN 3550
2500 DISPLAY AT(22,1)BEEP:"INCORRECT ANSWER
."
2510 DISPLAY AT(23,1)BEEP:"DO YOU WANT TO P
LAY AGAIN?"
2520 DISPLAY AT(24,1):"PLEASE TYPE ""YES""
OR ""NO""."
```


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Or mail check or M.O. to:
DATAX,
1923 Linden Street,
Ridgewood, NY 11385

Questions & info call: 718-417-0165


```
2530 GOTO 2450
2540 LET K1=INT((Q-1)/16)+1
2550 LET J2=Q-16*(K1-1)
2560 LET K2=INT((J2-1)/4)+1
2570 LET K3=Q-(K1-1)*16-(K2-1)*4
2580 ROW=25-((K1*5)+(K3-1))
2590 COL=4+((K2*2)+(K3-1))
2600 LET Q=K1*100+K2*10+K3
2610 RETURN
2620 FOR S=1 TO 76
2630 LET J1=M(S,1)
2640 LET J2=M(S,2)
2650 LET J3=M(S,3)
2660 LET J4=M(S,4)
2670 LET G(S)=X(J1)+X(J2)+X(J3)+X(J4)
2680 NEXT S
2690 GOSUB 3560
2700 RETURN
2710 FOR I=1 TO 64
2720 IF X(I)<>0 THEN 2770
2730 LET X(I)=5
2740 LET Q=I
2750 GOSUB 2540
2760 GOTO 1840
2770 NEXT I
2780 DISPLAY AT(22,1)BEEP:"THE GAME IS A DR
AW."
2790 GOTO 2430
2800 FOR K=1 TO 18
2810 LET P=0
2820 FOR I=4*K-3 TO 4*K
2830 FOR J=1 TO 4
2840 LET P=P+X(M(I,J))
2850 NEXT J
2860 NEXT I
2870 IF P<4 THEN 2910
2880 IF P<5 THEN 2940
2890 IF P<9 THEN 2910
2900 IF P<10 THEN 2940
2910 NEXT K
2920 GOSUB 3470
2930 GOTO 2080
2940 LET S=1/8
2950 FOR I=4*K-3 TO 4*K
2960 GOTO 3350
2970 NEXT I
2980 LET S=0
2990 GOTO 2950
3000 DATA 1,49,52,4,13,61,64,16,22,39,23,38
,26,42,27,43
3010 DATA 1,49,52,4,13,61,64,16,1,49,52,4,1
3,61,64,16
3020 DATA 1,2,3,4,5,6,7,8,9,10,11,12,13,14,
15,16,17,18,19,20
```

(See Page 30)

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"The Leader of the Pack"

Myarc's 9640 starts production run

Lou Phillips, president of Myarc Inc., says that the gate arrays for the company's 9640 computer have been received and the company is "moving into production" with them.

The computer includes 512K of dynamic RAM, a Texas Instruments 9995 microprocessor, a boot ROM, a high-speed, no wait state static ROM for storing the code for floating point arithmetic and to display images on the screen, a real time clock and the same sound generator chip as used in the 4A. The same 9901 chip as is used in the 4A is used as an interrupt controller. A 9938, produced jointly by Microsoft and Yamaha, with 128K of DRAM is also on the board. Connectors include an 8-pin DIN connectior for video, five pins of which are the same as the com-

(See Page 31)

3D TIC-TAC-TOE—

(Continued from Page 28)

```
3030 DATA 21,22,23,24,25,26,27,28,29,30,31,
32,33,34,35,36,37,38
3040 DATA 39,40,41,42,43,44,45,46,47,48,49,
50,51,52,53,54,55,56
3050 DATA 57,58,59,60,61,62,63,64
3060 DATA 1,17,33,49,5,21,37,53,9,25,41,57,
13,29,45,61
3070 DATA 2,18,34,50,6,22,38,54,10,26,42,58
,14,30,46,62
3080 DATA 3,19,35,51,7,23,39,55,11,27,43,59
,15,31,47,63
3090 DATA 4,20,36,52,8,24,40,56,12,28,44,60
,16,32,48,64
3100 DATA 1,5,9,13,17,21,25,29,33,37,41,45,
49,53,57,61
3110 DATA 2,6,10,14,18,22,26,30,34,38,42,46
,50,54,58,62
3120 DATA 3,7,11,15,19,23,27,31,35,39,43,47
,51,55,59,63
3130 DATA 4,8,12,16,20,24,28,32,36,40,44,48
,52,56,60,64
3140 DATA 1,6,11,16,17,22,27,32,33,38,43,48
,49,54,59,64
3150 DATA 13,10,7,4,29,26,23,20,45,42,39,36
,61,58,55,52
3160 DATA 1,21,41,61,2,22,42,62,3,23,43,63,
4,24,44,64
3170 DATA 49,37,25,13,50,38,26,14,51,39,27,
15,52,40,28,16
3180 DATA 1,18,35,52,5,22,39,56,9,26,43,60,
13,30,47,64
3190 DATA 49,34,19,4,53,38,23,8,57,42,27,12
,61,46,31,16
3200 DATA 1,22,43,64,16,27,38,49,4,23,42,61
,13,26,39,52
3210 FOR J=1 TO 4
3220 IF X(M(I,J))<>1/8 THEN 3310
3230 LET X(M(I,J))=5
3240 IF G(I)<5 THEN 3270
3250 DISPLAY AT(22,1)BEEP:"I GOT YOU NOW!"
                          1)BEEP:"VERY GOOD!"
3280 LET Q=M(I,J)
3290 GOSUB 2540
3300 GOTO 1840
3310 NEXT J
3320 DISPLAY AT(22,1)BEEP:"COMPUTER CONCEDE
S THIS GAME."
3330 GOTO 2430
3340 LET S=1/8
3350 IF I-INT(I/4)*4>1 THEN 3380
3360 LET A=1
3370 GOTO 3390
3380 LET A=2
3390 FOR J=A TO 5-A STEP 5-2*A
3400 IF X(M(I,J))=S THEN 3430
3410 NEXT J
3420 GOTO 2970
3430 LET X(M(I,J))=5
3440 LET Q=M(I,J)
3450 GOSUB 2540
3460 GOTO 1840
3470 FOR I=1 TO 64
3480 IF X(I)<>1/8 THEN 3500
3490 LET X(I)=0
3500 NEXT I
3510 GOSUB 3560
3520 RETURN
3530 DISPLAY AT(22,1)BEEP:"INCORRECT MOVE,
RETYPE IT--"
3540 GOTO 1060
3550 CALL CLEAR :: END
3560 REM CLOCK
3570 CLK=CLK+1
3580 ON CLK GOTO 3590,3610,3630,3650
3590 DISPLAY AT(5,22)BEEP:"|"
3600 RETURN
3610 DISPLAY AT(5,22)BEEP:"}"
3620 RETURN
3630 DISPLAY AT(5,22)BEEP:"~"
3640 RETURN
3650 DISPLAY AT(5,22)BEEP:"{"
3660 CLK=0
3670 RETURN
```

MG to halt making GRAM Kracker

MG, formerly Millers Graphics, has confirmed that it is phasing out the manufacture of its GRAM Kracker, a device which allows users to modify the computer's operating system, make changes to cartridge-based programs and save them.

Craig Miller of MG says the company has "had trouble delivering that product (the GRAM Kracker) since the beginning." Not being able to deliver the product on time "was ruining our reputation," he notes.

He affirms that MG is still in the TI market. "If we weren't in the 4A market we wouldn't have sent out a new brochure with new products for the 4A."

New products for the 4A in the brochure are a new PROM set for CorComp's 9900 disk controller card, which Miller emphasizes is not for use with CorComp's Mini-Peripheral Expansion System, which sells for $34.95; and the GRAM Kracker Utility I, written by Danny Michael, which sells for $10.

Also included is a new IBM product, he says, which "fits in with our coming IBM expansion system for the 4A."

Details of that system are scheduled to be announced in January by the company, as yet unnamed, involved in the production and manufacturing of the system.

MG is located at 1475 W. Cypress Ave., San Dimas, CA 91773.

9640—

(Continued from Page 30)

posite video connector used on the 4A, enabling users to use their present monitor with the 9640. The remaining three pins are for RGB blue and green and the RGB synch signal. A jumper is used for the red signal. A user will be able to select RGB or composite display at any time. Also included are ports for a mouse, joystick and IBM compatible keyboard.

For further information, contact Myarc, P.O. Box 140, Basking Ridge, NJ 07920 or (201) 766-1700.

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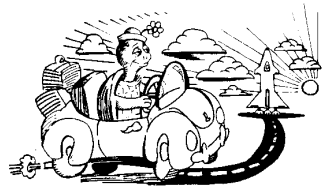

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RON ALBRIGHT REPORTS. . .

"The first book, "The Orphan Chronicals", was ABOUT you—the Texas Instruments 99/4A enthusiast. Now, there is a book BY you. The "Orphan's Survival Handbook" is the one-stop information source for the TI user."

"The ***"Orphan's Survival Handbook"*** was both easier and harder to put together than was the 'Orphan Chronicles'. Easier in that it was already written! It is an anthology or material gleaned from literally hundreds of user group newsletters and hundreds of hours of downloaded files from bulletin board systems. It is the "Best of" you—the TI user group members, hackers, programmers, and newsletter editors. Why, then, was it difficult? There was so much quality material available! The hardest thing was not finding enough material, it was deciding what I could leave out!"

"The ***"Orphan's Survival Handbook"*** is a 200-plus page compendium of TI material. It is filled with schematics, hardware hacks, programs, tips, and tutorials from across the country. Where to call, where and what to buy, and what to read. Moreover, it contains new, "never-before-seen" material from some of the brightest minds in the TI community (too numerous to name them all). Looseleaf, and three-hole punched, the manual can be placed conveniently in a binder for easy access. And updates (which are planned for registered owners) can be easily incorporated into your "Handbook" as new insights and developments become available. While I can't guarantee the "Handbook" will have "everything you ever wanted to know", I can assure you that it has most everything I could think of, NOW AND LATER. This handbook will continue to grow. . .in comprehensiveness and in its personal value to YOU!"

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Working with Multiplan

BASIC program transfers data to spreadsheet

By BILL HARMS

In this article I will introduce you to a method to transfer data from a BASIC program for use by Microsoft Multiplan.

I use Multiplan to keep my budget and to estimate my income taxes. I have a spreadsheet with 18 columns: 12 months, Yearly Total, Year-To-Date, Weekly Average, Monthly Average and two for taxes. Those last two have formulas to get various numbers from the spreadsheet. The rows include the following categories: Pay, Interest, Expenses, Loans and Other. You can really do "What If'ing" and "Why Not'ing" with Multiplan.

It was a bear, however, adding up all the darn monthly checkbook entries in separate categories (Meals Out, My Pay, My Wife's Pay, Groceries, Interest, etc).

Since Multiplan doesn't have a FOR/NEXT capability and cannot scan data until some criteria is met it was too time-consuming to enter the 100 to 150 monthly entries directly from my checkbook into Multiplan, even if there was enough RAM.

Now I use a fast little Extended BASIC program I wrote to get those transactions added by category. Then I can use a SYLK creator to quickly and correctly prepare them for loading into my Multiplan spreadsheet.

SYLK (or Symbolic Link) files are a little known feature of Multiplan. They can be written to disk by a BASIC program and read by Multiplan.

In this article I will show you how this is done. This material is based on a program I got from Texas Instruments, a series of articles in the May (and later) 1985 Super 99 Monthly (now called The Smart Programmer) and the Multiplan manual.

This bare-bones program is based on the one I received from TI in 1984. The disclaimer was bigger than the program! It writes a disk file with a one cell spreadsheet that can be read by Multiplan.

```
100 OPEN #1: "DSK1.SYLKF", D
ISPLAY ,OUTPUT ,FIXED 128
110 CALL CLEAR
120 INPUT "ROW NUMBER: ": R$
130 INPUT "COLUMN NUMBER: ":
 C$
140 INPUT "CELL CONTENT: ":
A$
150 FOR Q=1 TO 27-LEN(A$)
160 W$=W$&CHR$(0)
170 NEXT Q
180 X$=CHR$(34)&A$&CHR$(34)
! Surrounds contents with qu
otes
190 Z$=CHR$(13)&CHR$(10) ! C
arriage return and Line Feed

200 Y$="ID;PMP"&Z$&"F;DGOGB"
&Z$&"B;Y"&R$&";X"&C$&Z$&"C;K
"&X$&Z$&"W;N1;A1 1"&Z$&"E"&Z
$&W$
210 PRINT #1: Y$
220 CLOSE #1
230 END
```

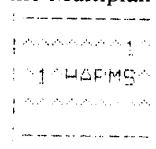
Line 200 has the symbolics needed for Multiplan to read the file. See page 205 of the Multiplan manual for explanations.

If you enter and run this program, you will find a file on your disk called "SYLKF." Before you can load this file, you must change it. It may seem a bit odd, but the file must be written as DISPLAY, FIXED 128 and then changed to INTERNAL, FIXED 128 in the file header. In other words, the file must use DISPLAY notation but must look like a INTERNAL file!

There are two ways to do this. You can use a sector editor to change the last four hex characters of the first line of the file header to 0202.

Once you have done this you may load your file. First, boot Multiplan. Press (T)ransfer and then (O)ptions. Next press (S)ymbolic and then ENTER. Now press (T)ransfer again and this time (L)oad your file.

Here is the Multiplan spreadsheet:



This is what the data looks like on disk using Miller Graphics Advanced Diagnostics program:

```
Drive : 2    Track  : 3
Side  : 1    Sector : 34
Byte  : 0    Display: Ascii

I D ; P M P * * F ; D G O G
B * * B ; Y 1 ; X 1 * * C ;
K " H A R M S " * * W ; N 1
; A 1 ^ 1 * * E * * * * * *
```

Most of the asterisks stand for CR/LF (carriage return/linefeed), Z$ in line 190.

There are many ways you could input data besides the simple INPUT in line 140. You could read data in from DATA statements or from a disk file. That disk file could be created by most anything: TI-Writer, RS232, another module or a Multiplan Print File.

You can create data in BASIC and then "dump" it into a spreadsheet en masse instead of just keyboarding it.

You could transmit the outputted SYLK file of your Multiplan spreadsheet to others via RS232. The DIF (Data Interchange Format) used by Lotus 1-2-3 and Visicalc only accommodates the cell content, not the sheet paramaters.

This is only a taste of what you can create to load data into Multiplan. It really opens Multiplan up to other software.

Next month we'll do a 2 row by 2 column spreadsheet.

Total Filer option

Warren Agee, author of the Total Filer program marketed by Asgard Software, notes that the program will also run out of Extended BASIC with 32K and a disk system as well as with Editor/Assembler.

Asgard's advertisement for the program in the November issue said that the program requires Editor/Assembler, 32K and a disk system.

Freeware update

Here are additions to the MICROpendium Freeware list. Unless otherwise noted, include required media and a stamped, self-addressed return mailer when ordering Freeware.

Those who wish to submit items for inclusion in the Freeware list may send a copy of the Freeware and a brief announcement describing the Freeware to MICROpendium Freeware, P.O. Box 1343, Round Rock, TX 78680. For a copy of the list (updated quarterly) send $1, same address.

DISK UTILITIES VERSION 3.2

John Birdwell, 7052 Springhill Cir., Eden Prairie, MN 55344, has a collection of programs that run out of TI-Writer, Extended BASIC or Editor/Assembler. Requirements include a memory expansion and disk system.

Utilities include Compare Disks, Print Sectors, Sector Editor, Find String, Disk Report, Directory/Comments, Printer Setup, Screen Colors and File Utilities. File Utilities include File Compare, File Print, File Edit, Find String and File Report.

The programs are fully documented. Birdwell asks that users who find Disk Utilities useful to send him $10.

TI LEDGER

Don Scott, of Rt. 9 Box 654, Claremore, OK 74017, says TI Ledger is identical to Automated Accounting on the IBM-PC. The program requires a disk system, memory expansion and a printer. Included is an attractively packaged manual.

The program allows to user to define a chart of accounts, to make journal entries, print an entry proof, make corrections, post the journal, print a trial balance, print financial statements (income and balance sheet), and close the ledger. The chart of accounts includes five categories: assets, accounts payable, equity, revenues and expenses.

Scott asks for a $5 contribution to help defray the cost of documentation.

Multiplan templates for taxes

James Sleeth of Financial Management Consulting in El Cajon, California, announces that 1986 Federal and State of California Multiplan Tax Templates are scheduled for shipping Jan. 10.

Federal Schedules A and B are designed to print the State A and B also, Sleeth says. Also available are the State Capital Gain and Capital Gain Schedule; Schedules C, D and E; the 1040 and California 540 plus the California Renters Credit.

Programs, which Sleeth encourages passing along as fairware, print only the data in order to save printing time and to avoid having to get governmental approval to print whole forms, he says.

Cost is $10 for Federal Forms or $15 for Federal and State Forms from James Sleeth, P.O. Box 20723, El Cajon, CA 92021.

REVERSE RLE

Stephen J. Tuorto, of 18 Chimney Lane, Bayshore, NY 11706, is offering an Extended BASIC program that produces a "negative" of an RLE (Run Length Encoded) picture. According to the author, it will reverse any RLE picture that is in the FIXED 128 format. Also included are several RLE pictures. Tuorto is asking for $2.50 if a mailer, postage and disk are provided, $4 if he is to provide disk, mailer and postage.

SIDE*PRINT VERSION 3.0

Jim Swedlow has updated his SIDE*PRINT program. SIDE*PRINT prints Multiplan spreadsheets sideways. Version 3.0 supports six additional printers, including Axiom GP550TI, Gorilla Banana, Tandy DMP-103 and DMP-130, Okidata ML92 and ML93. It continues to support the Gemini 10X, Panasonic KX-P1090, Epson FX 80 and all Epson-compatible printers.

Other additions to the program are a small character set that allows printing from 88 to 133 rows per page, new default screen allowing the user to configure the program to his system, updated documentation and user suggestions.

Send $5 or a disk, self-addressed, stamped return mailer. Those who have printers not listed above may write to Swedlow. "I have been quite successful in adding new printers to SIDE*PRINT," he says.

PROSPECT LIST

Leo Du Bry, of 325 S. Center St., Longview, TX 75601, has added a program called Prospect List to his Freeware offerings. His other programs are 16-Column Worksheet Accounting and George Tells a Fortune. He asks for a $5 contribution for each program.

Prospect List requires Extended BASIC, a memory expansion, disk system and printer. The program is used to compile and maintain a mailing list.

FOR RADIO OPERATORS UPDATE

Tony Robinson, of P.O. Box 76799, Vancouver, British Columbia, V5R 5S7, is asking that those who order his programs Quad and Gamma Match include $4 when a disk and self-addressed, return mailer are included with orders, or $6 if Robinson is to supply the postage and disk.

GENE-II

Walter Davies, 17718 Orchard Lane, Salinas, CA 93907, is offering this geneological program for $5 plus disk, and self-addressed, return mailer. The program is used to list, search and print a family tree. The Extended BASIC program requires a disk system and printer.

REMOVED FROM FREEWARE

Charles Kurzhal has removed his *Programs for Testing* from the Freeware listing. The three-program package is used to create, print and take user-written tests. Kurzhal says Disk Only Software will be marketing them.

GK Utility I, II and GRAM Packer

2 essential GK utilities

BY WALTER HOWE

GK Utility I was developed for Miller Graphics by Danny Michaels, author of two fine fairware programs, Screen Dump and Neatlist. The program and documentation are on one single-sided, single-density disk, thus the requirement for use of a printer.

The utility provides significant enhancements to both TI Extended BASIC and the Editor/Assembler. These enhancements are primarily for programmers. Some of the changes, such as installing a true lowercase character set in the console operating system and the ability to bypass autoloading, will be welcomed by all users.

You have the option whether to install both the XBASIC and E/A enhancements or just the XBASIC enhancements. The combined changes occupy GRAMs 1 through 7. The XBASIC changes alone occupy GRAMs 3 through 6 only, leaving plenty of room for other LOADs, such as can be loaded with the GRAM Packer, the subject of the second part of this review.

You also have the option of installing the modifications to the operating system (in GROM/GRAM 0). In my case, since I had already made substantial changes to the operating system, including a character set which I preferred to the new one, I did not keep the operating system changes in my system after trying it out.

Installation of the changes is simple and well-documented. It requires first saving XBASIC, and optionally the E/A cartridge, and GROM 0 to disk, following the usual GRAM Kracker procedures. You then run the XBEAPATCH program from the GK Utility I disk by using the GRAM Kracker Load Module option. The program asks you if you are running the XBASIC only or the combined option. In the latter case, you place a disk with the E/A EDIT1, ASSM1, and ASSM2 files in drive one. These are loaded into the GRAMs and automatically modified to provide you with a complete assembly editor package. Whichever option you selected, you then save the altered GRAMs to disk. You never have to repeat the procedures again, unless you want a different option.

Review

Report Card

Performance	**A**
Ease of Use	**A**
Documentation	**A-**
Value	**A**
Final Grade	**A**

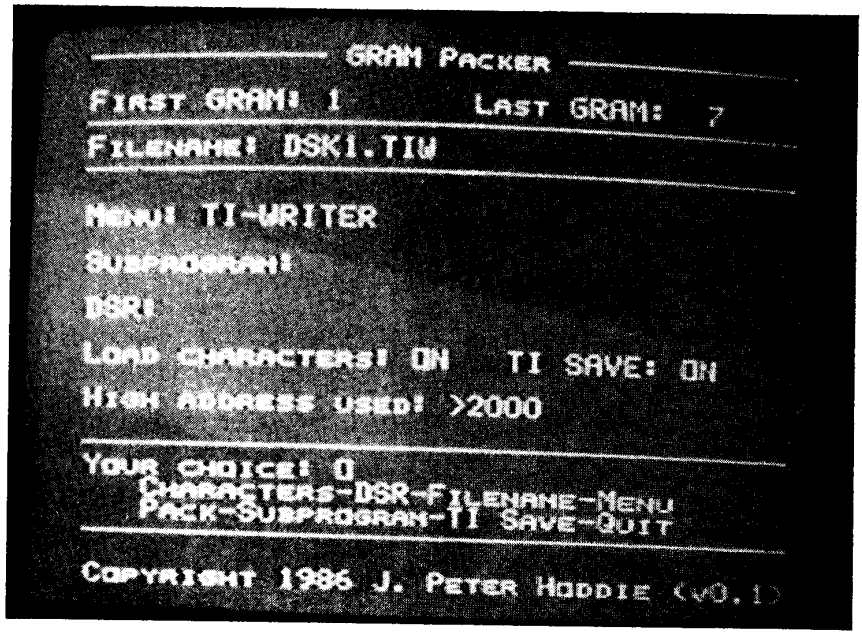
Cost: $10.00
Manufacturer: Miller Graphics, 1475 W. Cypress Ave., San Dimas, CA 91773
Requirements: 80K GRAM Kracker, console, memory expansion, disk system with at least one disk drive, one time use of a printer, TI Extended BASIC (version 110 only), Editor/Assembler cartridge and disks (optional).

XBASIC MODIFICATIONS

As a frequent XBASIC programmer, I found the XBASIC enhancements to be of great value. It makes editing programs under development so much easier, that I would hate to ever go back to the old system. For example, you can move the cursor immediately to the beginning or end of a program line, and you can use the arrow keys to move the cursor up and down within a long program line.

Another valuable series of enhancements is the addition of COPY, DEL (delete), and MOVE commands, and a selective RES (resequence). Each of these works on a range of lines. Shortly before I bought this utility, I modified an old XBASIC program to add assembly links in place of some slow XBASIC routines. I laboriously removed the old lines that I was replacing one at a time. With GK Utility I, I could have deleted them all with one command!

(See Page 35)



GK UTILITY I—

(Continued from Page 34)

Then there is another problem that I have run into many times. I have blocked out a program I am starting on into a structure of subroutines with an orderly numbering system, separating each subroutine into its own number sequence. Inevitably, at some point I find I need to insert more lines than I have numbers left for. Before this utility, I either renumbered lines one by one to open up the needed space, or I grudgingly RESequenced the whole program, abandoning the whole orderly numbering system. With GK Utility I I can RESequence just that section where I need to create some space. These commands also make it a lot easier and faster to pick a subroutine out of a program and port it over to another program.

I do find one fault with the new RES command. In TI XBASIC, if you RESequence and there is a branch to a line number that does not exist, the line number 32767 is listed as the branch address. The new GK XBASIC does not change the nonexistent line number at all. While it may be annoying to find those 32767s, it is much more annoying to know there is a mistake that does not stand out so readily.

For debugging programs, the TRACE command is modified to allow output to a printer or disk. No longer do you have to watch numbers flying by onscreen while you try to spot what went wrong.

PEEKG, POKEG, PEEKV, and POKEV subprogram CALLs have been added so that now you can PEEK and POKE to all three types of memory in the 99/4A—console RAM, VDP RAM and GRAM/GROM. Of course, you may read GROM, but not write to it.

The new CALLs included with the GRAM Kracker are also supported by the new XBASIC. These include NEW, BYE, CLSALL, CLOCK, CLKOFF and CAT. If you have the GRAM Kracker, you already have access to these, so they will not be explained here.

There are some cosmetic changes in addition to the new character set. The default screen color is now white on dark blue. This is not my favorite color scheme, but changing it is easy.

This is not a complete listing of the XBASIC changes, but it covers the most visible and useful ones. The last one I will mention is the command CALL EA, which passes control to the E/A, provided you have installed the combined modifications.

E/A MODIFICATIONS

The E/A comes up with white on dark blue letters. The Editor/Assembler menu has three new additions:

6. Extended BASIC
7. Format RAMdisk
8. Catalog Disk

Option 6 takes you back to XBASIC. Option 7 allows you to format a Myarc RAMdisk—the version that does not have Myarc's XBASIC II installed. I guess Miller Graphics assumed you would not have both XBASIC's, which isn't always true, as in my case. Option 8 will catalog any device with a catalog routine, such as floppy disk, RAMdisk, and hard disk controllers.

The editor and assembler routines are now installed in the GRAM Kracker for immediate access. In the editor, repeating keys have been added, and several other on-screen editing functions have been added, similar to TI-Writer's, such as a FCTN 3 Delete. Filename recall has been added as in Funlwriter, so that your last file access is remembered and appears onscreen when you select a file access routine.

There is a price paid for these enhancements. The BASIC support utilities that appear in the E/A cartridge are no longer present. If you want to run a BASIC program that requires the E/A cartridge to be plugged in, you still need the cartridge. Such a program will not run from the GRAM Kracker with the modified E/A. It will run, of course, if you install the program saved from the original cartridge instead of the new enhancement.

Documentation: The documentation is fully up to Miller Graphics' high standards, even though it is on disk instead of in a separate booklet, undoubtedly a cost-cutting step, which was passed along to us in the low $10 price. A BASIC print routine is included to print the document. The 25-page booklet includes extensive technical information as well as clear and "friendly" how-to-do-it instructions. Addresses of free memory space left within the GRAM Kracker are listed, and all key addresses of things you might want to change, such as screen colors, are listed.

GRAM PACKER
Report Card

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

Cost: $10
Manufacturer: Genial Computerware, P.O. Box 183, Grafton, MA 01519.
Requirements: GRAM Kracker, MAX-IMEM or GRAM KARTE, TI-99/4A console, 32k memory expansion, disk controller and drive, RAMdisk (optional).

While the GK Utility I is primarily for programmers, the GRAM Packer is for everyone. With it you can customize the main TI screen menu to add all the assembly programs and cartridges you want, limited only by menu size. Note that I said menu size, not GRAM memory size. You can keep XBASIC in GRAMs 3 through 6 of the GRAM Kracker or other GRAM device and still have room for everything else that can fit on the main menu. The secret is that not only can you load cartridges and programs into GRAM space, but with GRAM Packer you can also create and load short, custom cartridge and program loader programs into GRAM space. These external loader programs take up only about 300 bytes each, and a lot of them will fit into a single 8K GRAM. With a RAMdisk or hard disk, external loads are very fast—almost as

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GRAM PACKER—

(Continued from Page 35)

fast as if they were in the GRAM Kracker itself.

The program's author, J. Peter Hoddie, previously developed versions of the DM-1000 disk manager and the Fast-Term terminal emulator that loaded in the GRAM Kracker. (These were presented in Genial TRAVelER, a diskazine.) After working through the procedures to create these versions, it occurred to him that the procedures could be programmed into a general purpose GRAM loader for many assembly programs. The GRAM Packer was the result.

If all that the GRAM Packer did was to load program image files (E/A 5 type), it would be worth the $10 cost. But Hoddie added many additional features along the way that make the program an exceptional value.

The primary features of the program are as follows:

1. You can pack as many program image files as you can fit into the GRAMs you select. Each one does not have to begin in a new GRAM, but will load in one after another as long as there is room. Each program loaded appears on the main menu.

2. You may create and pack short loader programs for program image files and saved cartridges so that they will appear on the main menu, but will reside on disk and load only when selected. This feature, particularly for RAMdisk and hard disk owners, is the most useful feature of all. Program loading is nearly as fast as for programs packed in GRAM space, but you are able to access as many programs as menu space permits.

3. You may also install on the main menu general purpose loaders for programs you use only occasionally that do not warrant a regular place in the menu. When you select a general loader—for assembly programs or cartridges—you are queried for the filename. When you enter the filename, the program is loaded in the same manner as programs listed on the menu.

In addition to these primary features, with each loader or file that you pack, you have options to install labels that you can CALL from BASIC or XBASIC or activate through a console GROM DSRLNK. To explain these functions in plain English, suppose you pack in DM-1000 and give it the a label of "DM" under the CALL SUBPROGRAM option of the GRAM Packer. Then, from BASIC or XBASIC, in either command mode or within a running program, the command CALL DM will load and run DM-1000. In the short time I have had the GRAM Packer, I have used this option many times.

Similarly, under the DSRLNK option, if you have given Fast-Term a label of FT, any device access such as "OLD FT," "RUN FT" or even "DELETE FT"—from the console, in BASIC or XBASIC programs, or in various other ways—will load and run Fast-Term. In effect, it tricks the computer into thinking that "FT" is the name of a peripheral device and activates it.

Following this idea, I tried to access Fast-Term from TI-Writer by trying to PF (Print File) to "FT." It didn't work. Then I tried to access DM-1000 from Fast-Term by opening a file called "DM." That didn't work either. A call to Hoddie cleared it up. It does not work *within* assembly programs unless they use Doug Warren's DSRLNK, published in the July 1986 Smart Programmer, which looks to console GROM for a device name first. Obviously, there are not many assembly programs that make use of that new DSRLNK routine. However, you should understand that these limitations are not severe. The DSRLNK loads *will* work within BASIC and XBASIC, from the E/A menu, and from any cartridge that does not load assembly code from disk.

To aid in future uses of the routine, Hoddie included the source code to that DSRLNK routine on the GRAM Packer disk, as well as source code for VMBW, VSBW, VMBR, VSBR, VWTR, KSCAN, XMLLNK, and GPLLNK. DSRLNK and GPLLNK are included with the permission of Craig Miller of Miller Graphics. Hoddie also added source code of his own for GMBW and GMBR routines. These additions to the disk make it a boon to assembly programmers who do not already have their own complete library of these routines on disk.

Two other options you are given when packing a file are whether to load a CHARA1 character-set file and to provide for program image files SAVEd with a different SAVE routine than TI's. Funlwriter, for example, includes its own SAVE routine, which is not identical to TI's. Any program created with the Funlwriter routine will not work with the GRAM Packer without this option. The default settings are to load CHARA1 and not to provide for a different SAVE routine. These settings will work with all present common program image files (those assembly programs that catalog as "program"-type files). It has been tested with Fast-Term, TI-Artist, Funlwriter, DM-1000, PRBASE, Mass Transfer, and Turbocopy, among others.

The program will not work with E/A 3-type object files (assembly programs that catalog as "display/fixed 80" files), although a future revision might include it, according to Hoddie. One of the reasons Hoddie added the source code to assembly utilities was to aid in converting E/A 3 programs to program image type.

Another natural addition to the GRAM Packer disk would be a fix to GROM 0 to change the main menu to single space. The current limitation is nine menu lines, and this can be doubled with single spacing. To make the single spacing readable, the large capital letter character set should also be changed to a 7-dot tall set instead of the present 8. These changes have been documented before, but I don't know of a readily available source for them. (*Readers may send in the procedures and MICROpendium will publish them—Ed.)*

Documentation: The program disk comes with a half-page size booklet with 12 pages of text. The documentation is thorough, but shows some signs of being hurried to meet a deadline (the 1986 Chicago TI Faire). It is not as user-friendly as it might have been, but considering that its primary audience is the fairly knowledgable GRAM Kracker owner, this will not be a

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X-10 Powerhouse

Take control of your gadgets

By JOHN KOLOEN

The X-10 Powerhouse home controller offered for use with the TI99/4A is a variant of the X-10 controller units available for use with other computer brands, or without computers. The basic units are produced by a Hong Kong company with U.S. and Canadian subsidiaries. CorComp designed a module, called the Home Sentry, that adapts the X-10 Powerhouse for use with the TI.

My first reaction upon receiving the interface unit was *big deal*. Who needs it? Not having any control modules at the time, I wasn't able to program any lamps to go off or on and thus relegated the device to a place at the foot of my computer station. A month or so later I received two control units: one for appliances and one for lamps. I then had an answer to the question of *who needs it*. I do.

Or so it seems.

Like the computer itself, the Powerhouse 10-X is designed to perform repetitive tasks. Such as running the filters in an aquarium, turning a coffee maker on and off in the morning, turning household lamps on and off while I'm away so as to give the house a lived-in look, controlling a stereo so that there is music when I wake up and go to bed, and so on.

Performance: The X-10 operates in a straightforward fashion. A user may program and reprogram it as often as desired.

The system consists of a GROM port cartridge (the Home Sentry Module), a box-like interface unit that plugs into the TI99/4A joystick port, and a collection of appliance and lamp control units that are purchased separately. Typically, a device is plugged into one of these units and the unit in turn plugged into an electrical outlet. The interface unit also must be plugged into an electrical outlet. The interface unit is battery backed in the event of a power failure. It uses a standard 9-volt battery.

Having attached the interface unit and after the cartridge is plugged in—incidentally, the cartridge will not work with Miller Graphics' GRAM Kracker—turn on the computer and select the X-10 option from the menu.

Review

Report Card

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

Cost: $79.95 for interface unit (includes 120-day warranty); control modules are about $14 each (prices for interface and modules vary according to retailer).
Manufacturer: CorComp Inc., 2211-G Winston Rd., Anaheim, CA 92806.
Requirements: console, TV or monitor, 9-volt battery for interface unit, X-10 modules.

Now, the fun begins. The main X-10 menu provides five options:

—Set Time Mode
—Set House Code
—Install Mode
—Operate Mode
—Exit Program

Normally, the Set Time Mode would be used only once. Selecting this option brings a screen that prompts you for the time and the day of the week. This information is saved to the interface unit where it is constantly updated as long as the unit is plugged into an electrical outlet or the battery is in place.

The House Code Mode is likely to be a seldom-used option. Each appliance or lamp module includes a pair of switches: one is the unit number and the other is the house code letter. Unless a user has more than one X-10 interface unit, he would use only one house code, usually the letter "A." Changing the house code designation will wipe out existing house code designations and the associated programmed events.

The Install Mode is used to determine the location of appliance and lamp control units in various rooms.

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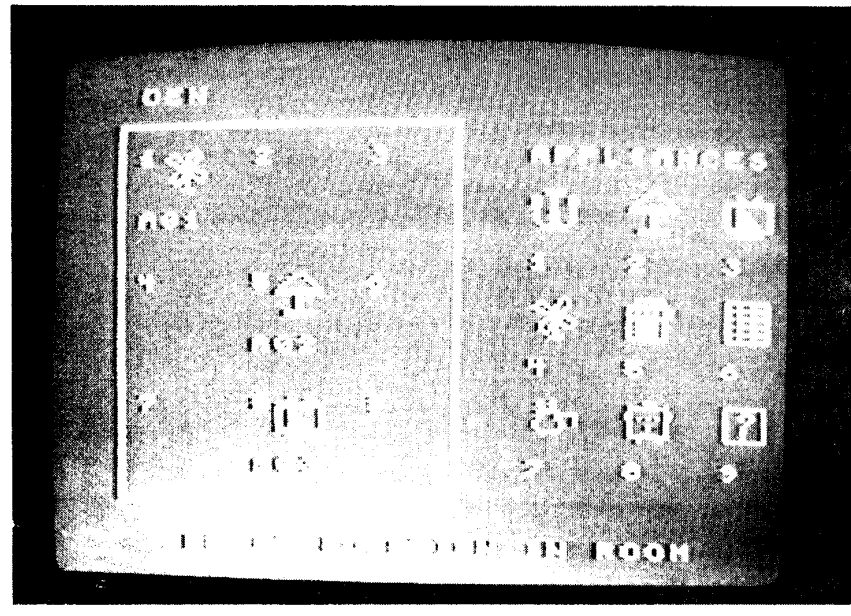

POWERHOUSE—

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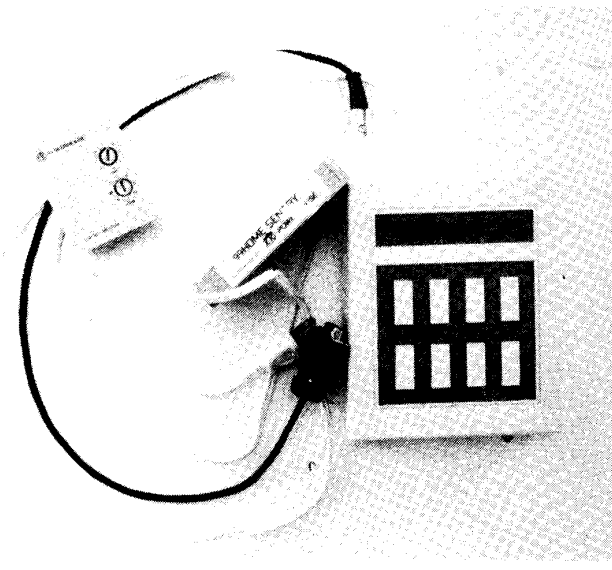
The install mode menu includes a listing of household locations: living room, kitchen, family room, den, master bedroom, bedrooms 1, 2 and 3, garage, laundry room, front yard, backyard, spare 1 and spare 2.

Having selected one of the rooms (the space bar is used to move a pointer down the list), press the enter key. The room list is replaced by another screen consisting of a rectangle with nine numbers on the left side and a collection of icons representing various electrical devices on the right side. These include a ceiling light, table lamp, television, fan, radio/stereo, air conditioner/heater, coffee pot, crock pot/slow cooker and a question mark for an appliance not among those already listed. The numbers, 1-9, are arranged in three rows within the rectangle. Each corresponds to a location within a room. Thus, each room may have up to nine appliances or devices independently controlled by X-10 modules.

Selecting one of the nine locations in the room causes the number to be highlighted. The next operation is to select an appliance icon for that location. Thus, if location No. 1 is a table lamp, you would select the table lamp icon. The selected icon will then appear to the right of the highlighted location number. You are then prompted for a house code (most likely it will be "A"). The code will then appear below the room location number. Finally you select the module number, ranging from 1 to 16. This number then appears to the right of the house code letter. You are then prompted to verify that the data is correct. Responding in the affirmative will result in the information being saved to the interface unit.

This process is repeated for each appliance module. This procedure may be done at any time. Previously programmed appliances may be deleted using the install mode. Simply select the room location number you want to delete and press FCTN 1. A Y/N prompt will appear. Answering "Y" will delete the appliance from memory.



Having determined the location and nature of each appliance module (modules are available to control wall switches, heavy duty appliances, thermostats, lamps, wall receptacles, 2-prong polarized and 3-prong ground appliances), you return to the main menu and select option four, the Operate Mode.

The Operate Mode is used to designate "programmed events." There are eight options available:

—On (turn an appliance or lamp on in the immediate mode)

—Dim (control the brightness of a lamp)

—Off (turn a device off in the immediate mode)

—Normal (program a device for regular, periodic operation)

—Security (same as Normal except that events will occur within an hour of the programmed time)

—Today (program events to be executed today only)

—Tomorrow (program events to be executed tomorrow only)

—Review (check the events programmed for each device)

Let's say that in the Install Mode you assigned an appliance module to a coffee maker in the kitchen. Through the Operate Mode you would give the coffee pot a unit number and instruct the X-10 when to turn it on. You may decide to have this event take place on a daily basis, and you may decide to have the module turn the coffee maker off at a certain time each day. If you like, you may program the interface to turn the coffee maker on and off several times during the day, or every other day, or only one day a week.

If you are programming a lamp, you also have the option of determining its brightness. Note that the X-10 system will not work with fluorescent lamps.

Having programmed your devices, you exit the system, disconnect the interface box and let everything happen on its own. However, even without the computer, you still have control over programmed devices using the interface box. The face of the box includes eight on-off switches corresponding to eight appliances control units. This gives you control over these units in the immediate mode, allowing you to override the programming if you wish.

All told, the X-10 Powerhouse can be programmed to store up to 128 independent events.

Ease of Use: Anyone with a home computer will have no problem using

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RAVE 99/101

Keyboard streamlines operations

By EDWARD S. MACHONIS

This keyboard has been aptly named. After an hour's use, I was sold.

For those who have not heard of it, the RAVE keyboard is a full-sized keyboard which attaches to the TI99/4A console and is used in lieu of the regular keyboard. I used the Model 99/101, so named, I guess, because it has 101 keys.

One hundred and one keys? Replacing a 48-key keyboard? How can one use 101 keys? Very easily, I assure you. After the first hour I felt so at home with this keyboard, I wondered if I ever could go back to TI-issue.

Although there is a FUNCTION key, on the left side of the keyboard, you won't find much use for it. There are 11 separate FUNCTION keys, labeled F1 through F11, located at the top of the keyboard (just above the number keys), which now provide the same functions formerly obtained by pressing FUNCTION and one of the numeric keys. Pressing F1 is equivalent to pressing FUNCTION and 1 (which is still available if desired). F11 is our old friend of ill repute, FUNCTION/=.

Existing overlay strips can be used with the function keys as the key spacing is nearly identical. Although there is room on the keyboard housing, no holder for overlay strips is provided. It should be possible to transfer the one from the console to the keyboard.

Operating modes: The keyboard can be operated in any of four distinct modes, numbered from 1 through 4. Perhaps it should have been named the 101/4. On power-up the keyboard is placed in Mode 1. The current mode may be checked at any time text can be displayed on the screen by pressing the SET UP key located in the upper left corner. Modes can be changed by pressing SET UP/SHIFT. Each such press will change the operating mode to the next higher mode. Mode 4 is followed by Mode 1.

Review

Report Card

Performance ..... **A**
Ease of Use ..... **A+**
Documentation ..... **A−**
Value ..... **A**
Final Grade ..... **A**

Cost: $164.95; escutcheon $4.95
Manufacturer: RAVE 99 Co., 23 Florence Rd., Bloomfield, CT 06002
Requirements: Console, Monitor or TV. Cassette or expansion system, printer optional.

Mode 1: I call this the programmer's mode. Features are the same as in Mode 2 except that the Quit feature is disabled on the F11 key (you can still quit with FUNCTION/=), and the frequently used double quote (") is available without pressing the shift key. The single quote (') becomes the shifted character.

Mode 2: This mode most closely emulates the old keyboard. All editing keys are active for use with Editor/Assembler.

Mode 3: TI-Writer mode. This is where the keyboard really earns its keep. All of the functions available with TI-Writer by pressing FUNCTION and a number key are, except for FUNCTION/0 (line numbers), available as separate editing keys on the keyboard. Since the keyboard's function keys would be redundant, they have been redefined to act as CONTROL/n keys, i.e., F1 is the same as CONTROL/1 (OOPS), etc. The F11 key provides line number display changes normally called with FUNCTION/0. Nearly all TI-Writer editing commands are available as single keystrokes.

The following single-keystroke commands are also available:

HOME = Home Cursor (CONTROL/L)

ESC = Command/Escape (FUNCTION/9)

BREAK = Left Margin Release (CONTROL/Y)

Delete to End of Line (CONTROL/K) is also available with SHIFT/LINE DELETE.

Although SHIFT/CHAR INSERT is documented to provide the Beginning of Line function (CONTROL/C) in Mode 3, this is apparently a documentation error as the function is available with SHIFT/LINE INSERT.

Mode 4: Multiplan Mode. Another heavy hitter. Again, nearly all Multiplan commands are available as single keystrokes. Call pointer is controlled with the four CURSOR keys and scrolling by the ROLL, shifted ROLL, WINDOW and BACK TAB keys.

The keyboard's FUNCTION keys (F1 through F10) have been defined to provide the functions normally ac-

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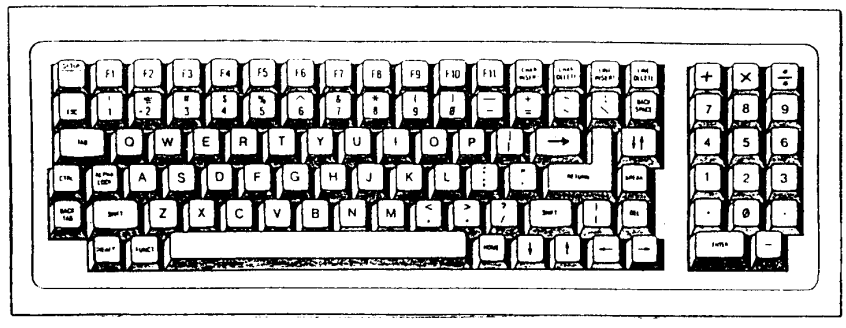

RAVE 99/101—

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cessed by pressing FUNCTION or CONTROL and a number key.

Keyboard: The beige keyboard housing is a little wider than the TI99 console but not quite as deep, measuring 16½ by 7½" and sloping from a height of 3" at the rear to 1⅜" at the front.

First on the "goodie" list are the four separate CURSOR keys allowing cursor control with a single key press. They work just like the old FUNCTION S D E X combination except that only a single key press is required.

An ALPHA LOCK key is provided just left of the letter A. Another "goodie": it does not interfere with joystick operation. Graphics programs such as TI Artist and GRAPHX become a lot more friendly.

The CONTROL key, just left of the Alpha Lock, functions as formerly except that it cannot be used with the number keys. Instead, Shift and F1 through F10 are used.

The following separate editing keys are provided: CHAR INSERT, CHAR DELETE LINE INSERT, LINE DELETE, BACK SPACE, DEL, TAB and BACK TAB.

CHAR DELETE and DEL provide the same function except in Multiplan, where CHAR DELETE works the same as FUNCTION/9 deleting the character to the left of the cursor and DEL deleting the character at the cursor.

TAB does just that in Mode 3 but acts as the Field Selector in Multiplan replacing CONTROL/A. A pleasure to use.

BACK TAB also provides its named function in Mode 3 but scrolls the screen to the left in Multiplan as with CONTROL/S.

The BREAK key will break running programs in Modes 1 and 2, same as FUNCTION/4. In Mode 3 it releases the left margin (CONTROL/Y). In Mode 4 it is documented to work as CANCEL (CONTROL/C) but did not so perform on my keyboard. Instead this function is performed by the ESC key, as logic would dictate.

The ESC or Escape key will access the command line in Mode 3 replacing FUNCTION/9 and, in Mode 4, will cancel the current operation (CONTROL/C).

The PRINT key is documented to return a Print Catalog command in Modes 1 and 2 when used with software and the Myarc disk controller. This was not verified by me as a Myarc controller was not available. It did provide the double quote code in these modes, which I found easier to use than the key provided for this. In Mode 3 it accesses the Command Line so that PF can be typed and in Mode 4 slects the print option "P" of Multiplan.

A WINDOW key, horizontal arrow pointing right, causes the screen to scroll to the right in Modes 3 and 4.

The ROLL key, two opposing vertical arrows, scrolls the screen DOWN or, when shifted, UP in both Modes 3 and 4.

A 17-key number pad is located at the right end of the keyboard. I found its ENTER key easier to use than the large L-shaped RETURN key. The "5" key has a raised dot to assist homing.

The function keys, cursor keys and frequently used editing and command keys are colored grey with white legend; all other keys are black with white legend. Key size and appearance are quite similar to those on the TI99 console. I found the key press resistance exactly to my liking, and my preference is for a slightly stiff keyboard.

They automatic key repeat takes off after a very slow start. Keys have to be held down approximately twice as long before repetition starts. It appears that after the key is held down for one second, it is repeated once; holding it down for an additional second starts the automatic key repeat.

The author, admittedly, is a pretty poor typist. A graduate of the hunt and peck school who never learned to type with all 10 fingers and who seems to be endowed with more than the usual allotment of thumbs, he was disappointed to learn that the new keyboard could spell no better than the old console. But the corrections were OH SO MUCH EASIER to make! Attempts were made to type as fast as I could, using familiar phrases such as "Now is the time" etc., to see if any letters would be dropped. None were so observed. This is not to say that rapid typists will experience the same results.

Installation: Installation, while not difficult, is not just a simple matter of plugging in the new keyboard into the console. It should be within the abilities of anyone who has spent a Christmas or two finishing up Santa's incompleted wares. The installation was accomplished in about 30 minutes.

If you have never opened your console, your biggest hurdle will be getting over the fear of doing so. The documentation contains a simple, clear, step-by-step procedure complete with excellent drawings.

Briefly, the console is opened, power supply disconnected, old keyboard unplugged and removed, new interface board installed and plugged into power supply and motherboard, console reassembled, keyboard plugged in and escutcheon plate installed to cover hole created by removal of old keyboard and to protect the interface card.

The advance copy of the documentation did not describe the installation of the escutcheon, which requires installing two spacers between the interface and the escutcheon (screws and spacers provided). The instructions advise that a connector conversion kit may be required for certain console models equipped with a different power supply connector and that such kit will be provided free upon request.

All wiring changes are accomplished by unplugging and plugging connectors. You are warned that it is possible to connect the power supply connectors improperly and damage the moth-

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RAVE 99/101—

(Continued from Page 40)

erboard and the interface card. Two separate drawings are provided to ensure proper orientation.

A user-installed option is described which enables Load Interrupt and Computer Reset from the keyboard. This option involves attaching two wires and a ground to the motherboard and modification of the GROM port connector. The option requires making solder connections to the motherboard, and, unless you have this type of experience, the reviewer suggests you solicit the help of someone who has. The option has not, as yet, been installed on the reviewer's console. A kit, consisting of a precut harness with connected connector to facilitate this modification, is available from the manufacturer for $4.

The existing console power supply is used to power the new keyboard and the interface card which contains 10 ICs. No rise in temperature was observed on the console above the power supply location.

The new keyboard is attached to the console with a coiled telephone-type cord which can extend up to about five feet. When installation is completed, the console should be relocated to a new convenient location as it is still used for all non-keyboard functions.

Performance: Except for two "missing keys," the RAVE 99/101 keyboard will not do anything in addition to what you can do at present with the TI99/4A keyboard. But you can do almost everything a lot easier with the 99/101. It is similar to the difference between operating with one disk drive or two. You can do everything with one drive, but it's so much easier with two.

The "missing keys" are key codes included in TI's original design for which no keys were provided. These keys are available in all modes and are generated as follows:

MISSING KEY 1—Shifted ESCAPE

MISSING KEY 2—Shifted BREAK

In BASIC or Extended BASIC only MISSING KEY 1 is available. It is detected by using the CALL KEY subprogram.

Both keys are available in assembly language programs and the instructions contain an example of source code for detection.

The keyboard performed almost flawlessly; no key bounces or dropped characters were experienced. On occasional power-ups, the keyboard appeared "dead" and, while one could move from title screen to TI menu by pressing any key, menu selection key presses would not be accepted. Pressing one of the function keys would "wake up" the keyboard.

Documentation: The documentation consists of 20 photocopied pages and is surprisingly complete. Installation drawings were models of clarity. A chart is included which shows, for each command key, the equivalent TI99 FUNCTION or CONTROL key press combination in each of the four operating modes. A few typos and omissions were noted.

Ease of use: I was pleasantly surprised at how quickly and easily the new keyboard was mastered. I cannot say my typing improved and for a short while it appeared to deteriorate. This review was written using the new keyboard and what started out as a short memo wound up being a full report, mostly because the keyboard made it a "fun" pastime.

Most TI-Writer errors are corrected with FUNCTION/2 (for Insert) and CONTROL/2 (for Reformat). It is ever so much easier, and in my case quicker, to use the CHAR INSERT and F2 keys for this purpose, pressing two keys instead of four. Accessing the Command Line with the ESC key or peeking at the line mumbers with F11 has to be experienced to be appreciated. Breaking one long paragraph into two is a simple matter of cursoring to the breakpoint and pressing F8, F2 and F8 in succession.

I find myself using the OOPS function a lot less often. No longer do I obliterate prose with braces by pressing SHIFT instead of FUNCTION when attempting cursor movement nor do I accidentally delete lines when trying to insert text. My word processor has become a lot friendlier and a pleasure to use.

I am not an Assembly or a Forth programmer, but I would imagine these features would be just as convenient in those applications as in word processing.

Microsoft designed Multiplan for single-keystroke operation. The limitations of the TI99 keyboard forced the addition of double key presses to the Editing, Action and Cursor keys. RAVE 99/101 restores Multiplan operation to its original concept.

In Mode 4 I found it a lot easier moving around a spreadsheet with the cursor and scroll keys.

My most frequent error in Multiplan is trying to correct a typing error by backspacing with Function S (through force of habit), and succeeding only in entering the erroneous data and moving one column left. Perhaps with BACK CHAR now available on F4 and on the BREAK key these incidents won't happen as often.

I believe I would have preferred scrolling left with a shifted WINDOW key instead of the BACK TAB, as then the four scroll functins would have been grouped together on the keyboard. This would involve a double key press instead of a single one and that may be the reason for the present arrangement.

The TAB key is very handy for moving through the various options once a command has been selected. It can also replace the space bar when moving through the command menu.

The ESC key provides the CANCEL feature which mind-changers and poor typists like myself will find a lot handier than the old CONTROL/C.

Value: The value of this keyboard varies directly with the amount of time one spends writing programs and using

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RAVE 99/101—

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TI-Writer and Multiplan, and it varies inversely with one's typing ability.

If most of your computer time is spent defeating the Alien Horde or exploring subterranean worlds, then the value will be minimal. Of course, it can serve as a status symbol to impress that Big-Blue snob next door.

On the other hand, if most of your computer time is spent on word processing with a little Multiplan and programming in between times, then the price, $164.95 plus $4.95 for the escutcheon (console cover), represents very good value. If, like me, you spend some of that time correcting typing errors, then it's a steal.

POWERHOUSE—

(Continued from Page 38)

the X-10 Powerhouse. It requires no programming skill.

Documentation: Several manuals come with the X-10. One of them, a 12-page document, is TI specific and was produced by CorComp. It provides plenty of information about using the X-10 system and is generally easy to follow. Two other pamphlets that come with the device are produced by the device's Hong Kong manufacturer. One basically repeats the information in the CorComp manual (or vice versa) and the other provides information about using the X-10 with other computer brands.

Value: Anyone who uses mechanical timers to control appliances or lamps may have reason to consider purchasing an X-10. The X-10 is far more accurate in terms of controlling electrical devices than mechanical timers, and the appliances/lamp modules themselves are priced to be competitive with mechanical timers. (Tenex, TexComp and Bits and Chips are among the distributors of the X-10 system and control modules.) The more devices one wants to control with timers, the more attractive this system looks.

GRAM PACKER—

(Continued from Page 36)

drawback for most. The only reason I gave the documentation as low of a grade as I did (if you call B a low grade) is that I believe the program is not just for sophisticated users, but has a lot of applicability to the average non-assembly programming user, too. "Average" users should be able to follow the instructions to create useful applications. Don't be concerned that you may not know what to do with the advanced features and the assembly source code on the disk. The program is valuable without them.

I hope that a future version of the documention—or perhaps articles on GRAM Packer's—will build upon what is there now. A lot more can be done with this powerful program than I have covered here.

Value: Both of the programs reviewed here, GK Utility I and GRAM Packer, should become standard utilities for GRAM Kracker owners. Both advance the state of the art while providing useful, everyday tools. Though you may not use GRAM Packer every day, you will use its products every day—the menus that you get when you turn on your computer.

These two programs, more than others that have gone before, make the GRAM Kracker an exceptionally useful device for all 99ers!

Newsbytes

V.7.1 99 BBS on line

A new version of the 99 BBS, version 7.1 is on line 24 hours at (213) 947-7777, according to Roger Davis of Whittier, California.

He says the board runs at 300/1200 baud and features Xmodem uploads and downloads, online adventure games, multiple message bases and information files including national information lists, a BBS list and a TI user group list. The board is in the PC Pursuit area.

Tigercub on disk

Jim Peterson has announced that his Tips from the Tigercub newsletter, which has been distributed for 3½ years to users groups around the world and widely reprinted in their newsletters, will cease publication with No. 41 of December 1986.

However, Peterson says the complete contents of all 41 issues are available in ready-to-run format as four full disks, each containing between 48 and 62 programs, routines and files. They are priced at $15 each, any two for $27, three for $35 or all four for $42, postpaid.

Volume IV, just released, contains the complete contents of Tips newsletters 33-41. Contents include a five-memory, five-window calculator, a program to fill and adjust hyphenated TI-Writer text, a four-sector routine to run any BASIC program in Extended BASIC and a decompacter to break Extended BASIC programs into single lines for modification.

To order, write Tigercub Software, 156 Collingwood Ave., Whitehall, OH 43213.

Ozark Software plans new expansion box

Ozark Software Systems of Neosho, Missouri, has announced plans to produce a TI-compatible expansion box by mid- or late 1987.

According to Gary Moore of Ozark Software Systems, the box will contail led power lights, front panel fuse, IBM-type 150-watt power supply, power for four disk drives, multiple surge protected outlets and two-fan cooling. The box will be "lighter in weight" and have a one-year warranty, Moore says.

Projected cost is $300-$350. Moore says he plans to use eight-bit and 16-bit data bus if users want it for future expansion. He says he would like input from "readers and companies."

For further information, write Moore at 1103 So. Lafayette, Neosho, MO 64850.

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Newsbytes

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MSP99 Users Group offers publications

The MSP99 Users Group has recently published a 24-page catalog listing all the user-written and fairware software in its library, according to Dick Lauhead, president of the group.

The catalog is available for $2.50.

The group also offers an eight-page manual showing drawings of all the ports of the TI99/4A, such as the joystick port, module port and I/O port, with descriptions of where each pin is physically located and what signal is on each pin. Also included are the pin definitions of the peripheral expansion box bus, instructions for installing a load interrupt switch and more, Lauhead says.

The manual is available for $3.50.

The publications may be ordered from MSP/MP, P.O. Box 12351, St. Paul, MN 55112.

RAMER 99 BBS on line in New Jersey

The Northern NJ 99er Users Group's TIBBS, written by Ralph Fowler, is on line at (201) 584-5373, according to David Sontos of the Northern NJ 99ers.

The board, the RAMER 99 operates at 300 baud from 7 p.m. to 11 p.m. eastern time, he says.

New clip art from Great Lakes Software

Great Lakes software has released a new companion disk for its graphics program JOY PAINT '99.

Clip Art Disk 2 (V1.1) contains new clip art, screens, illustrations and character sets for use with JOY PAINT '99. Additionally, the disk contains files to allow the user to print ready made Christmas and birthday greetings in card form.

Ernest Chandler of Great Lakes Software notes that the diskette has been updated since its release at the Chicago TI-Faire Nov. 1, and users can obtain a copy of the new version (not to be confused with Clip Art Disk 1, which comes with JOY PAINT '99) by sending back their original diskette along with $3.

Chandler says Great Lakes has also created a Clip Art Co-op for JOY PAINT '99. He says users who have created graphics with JOY PAINT can send their creation on a floppy diskette to the company, which will in turn send them a current copy of the co-op library.

"The graphics that the users send us will then be added to the library to perpetuate its growth," he explains.

He says users need only send "a couple of small clip-art objects" to receive a copy of the co-op library, though full-screen artwork and illustrations are welcome as well.

Contributions may be sent to Great Lakes Software, Attn: Clip Art Co-op, 804 E. Grand River Ave., Howell, MI 48843.

Computer inventory may be donated

Manufacturers, distributors, wholesalers and retailers with excess, slow-moving inventory, including hardware and software for the TI99/4A, can turn it to their advantage by donating that merchandise to the National Association for the Exchange of Industrial Resources, according to Jack Zavada of NAEIR.

Donations to the non-profit, tax-exempt organizations qualify for deductions under Section 170 (e)(3) of the Tax Reform Act of 1976.

The only stipulation is that the merchandise donated be unused and in the original box, Zavada said, but "it can have been sitting in a warehouse forever."

NAIER distributes the materials to its 6,500 members across the U.S. Members—who must be non-profit, tax-exempt organizations, include schools, colleges, universities, hospitals, nursing homes, camps, YMCAs, Salvation Army chapters, church groups, museums, law enforcement agencies, rehabilitation centers and homes for the mentally and physically handicapped, he said.

Donors may deduct the cost of materials donated, as carried on their books, plus half the difference between the cost (basis) and fair market selling price. However, the deduction cannot exceed twice the cost.

He said NAEIR members pay $395 annual dues and receive an average of $4,200 a year in new merchandise.

For a free information kit about the donation process, write Cruz A. Ramos, Director of Donor Relations, NAEIR, Dept. SG, 560 McClure St., P.O. Box 8076, Galesburg, Il 61402 or phone him at (309) 343-0704.

Newsbytes is a column of general information for TI99/4A users. It includes product announcements and other items of interest. The publisher does not necessarily endorse products listed in this column. Vendors and others are encouraged to submit items for consideration. Items submitted will be verified by the staff before inclusion and edited to fit the Newsbytes format.

User Notes

Record those high scores

Howard Uman, of Randallstown, Maryland, writes:

I got inspired by the (Night Mission) High Score feature addition in the October 1986 User Notes by Kazco International. I figured if they could add a high score feature, I'll make it save it to disk to have an ongoing high score.

Uman's modifications are in two parts. The first is a single program line that sets up the high score file. It should be executed separately. Simply enter the line and RUN it. Here it is:

```
100 OPEN #1: "DSK1.HIGHSCORE
" :: PRINT #1: 0 :: CLOSE #1
```

The second part consists of two lines to be added to the Night Mission NM-JOY program and one line to be modified. Here are the additional lines:

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```
1 OPEN #1: "DSK1.HIGHSCORE",
 INPUT :: INPUT #1: HSC$ ::
CLOSE #1 :: HS=VAL(HSC$)
291 OPEN #1: "DSK1.HIGHSCORE
" :: PRINT #1: STR$(HS) :: C
LOSE #1 :: END
```

Here is the line to be modified:

```
290 IF T=89 OR Y1 THEN 220 E
LSE IF T=78 THEN CALL DELSPR
ITE(ALL ) :: CALL VCHAR(1,1,
32,768) ELSE 280
```

Save this modified NMJOY file and load it using the Night Mission load program.

The program will now read the high score at the beginning of play and saves the updated version only after play is completed.

Changes to PUTDOT LINE routines

Jack H. Miller, of Trenton, Michigan, recommends changes to PUTDOT and LINE, subroutines that were published with the first installment of Darren Leonard's computer graphics articles. Miller writes:

I found a mistake in PUTDOT, and LINE is correct only for lines that go through (0,0). The PUTDOT error is minor because the limits only are affected—the vertical and horizontal limits are reversed. A correction is as follows:

```
501 X=Q :: Y=V :: IF Y<-125
OR Y>125 THEN 532
502 IF X<-95 OR X>95 THEN 53
2
```

The program LINE, however, has major problems in that if the two points (X1,Y1) and (X2,Y2) do not lie on a line going through (0,0), extended if necessary, then the line drawn does not go through (X2,Y2). In addition, the program fails for vertical lines. The following substitute program works:

```
100 SUB LINE(X1,Y1,X2,Y2)
110 X1=INT(X1) :: X2=INT(X2)
 :: Y1=INT(Y1) :: Y2=INT(Y2)
120 IF X2-X1=0 THEN 180
130 SLOPE=(Y2-Y1)/(X2-X1) ::
 INTER=Y1-SLOPE*X1
140 FOR PARA=X1 TO X2 :: Y=S
LOPE*PARA+INTER
150 CALL PUTDOT(X,Y)
160 NEXT PARA
170 GOTO 220
180 X=X1
190 FOR PARB=Y1 TO Y2 :: Y=P
ARB
200 CALL PUTDOT(X,Y)
210 NEXT PARB
220 SUBEND
```

Second opinion

Dwight Klettke, of Summit Park, Utah, writes:

From the User Notes, July 1986 issue, re LEFT$, MID$ and RIGHT$, the kernel idea has merit and might prove useful for some programmers. I therefore submit a demo program which *will* provide similar capabilities. The coding as provided in the July issue is wrong from basics up.

First, the entire concept is incorrect. DEF doesn't accept multiple parameters. You can't have 100 DEF LEFT$(X$,Y). Go ahead, try it. You'll get a syntax error if you do. But multiple parameters sure look familiar, don't they? Of course, subprograms pass multiple parameters. That's what I'll use instead.

Second is line 120 as printed. The first problem is the obvious typo of the extra left parenthesis. That shouldn't confuse anyone for long. However, there is also a typo or an error in the SEG$ portion. It should be LEN(X$)-Y+1, not LEN(X$)-Y-1.

There's also a slight inconsistency which has no effect on the program workings. In lines 100 and 120, Y is the number of characters of the new string segment. In line 110, Y becomes the location of the first character desired, and Z becomes the number of characters of the new string segment. My routine standardizes this; but that certainly can vary as a matter of personal preference.

In my example I pass the variable Y$. This could be omitted and X$ dealt with alone; but then X$ is always changed from its original appearance. This method with the Y$ allows more leeway, but again could be modified by programmers according to preference.

Note SUBs and CALLs must be as written (e.g. SUB LEFT...) and not SUB LEFT$.... The $ character is not recognized in subprogram names.

It should also be remembered that variables in subprograms are distinct from those in the main program, even if they have the same name. This permits faster variable assignment. For example, the statements 25 CALL LEFT(X$,9,Y$) :: A$=Y$ :: PRINT A$ and 25 CALL LEFT(X$,9,A$) :: PRINT A$ are equivalent.

```
10 X$="LEFT SIDE/&CENTER/ &
RIGHT"
20 CALL LEFT(X$,9,Y$) :: PRI
NT Y$
30 CALL MID(X$,10,9,Y$) :: P
RINT Y$
40 CALL RIGHT(X$,9,Y$) :: PR
INT Y$
100 SUB LEFT(X$,Y,Y$) :: Y$=
SEG$(X$,1,Y) :: SUBEND
110 SUB MID(X$,Z,Y,Y$) :: Y$
=SEG$(X$,Z,Y) :: SUBEND
120 SUB RIGHT(X$,Y,Y$) :: Y$
=SEG$(X$,LEN(X$)-Y+1,Y) :: S
UBEND
```

Foundation card memory tested

Users of the Foundation Computing 128K card may not have anywhere to turn for support, but with the following program they'll know if their card is in working order. Chuck Reinhart, of Bellaire, New York, provided the program, which he uses to diagnose Foundation 128K cards.

The program first writes to the card and then reads the memory contents. The test, which takes several minutes, will indicate if there is a bad memory chip.

```
1 REM ** THIS TEST WILL CHEC
K FILE MEMORY IN 128K CARD *
*
26 OPEN #1: "MEMINIT",FIXED
10 :: CLOSE #1
```

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User Notes

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```
50 OPEN #1: "MEM96",FIXED 12
8,INTERNAL ,RELATIVE
100 X$="////////////////////
////////////////////////////
////////////////////////////
////////////////////////////
////////////////////////"
110 P$="PPPPPPPPPPPPPPPPPPPP
PPPPPPPPPPPPPPPPPPPPPPPPPPPP
PPPPPPPPPPPPPPPPPPPPPPPPPPPP
PPPPPPPPPPPPPPPPPPPPPPPPPPPP
PPPPPPPPPPPPPPPPPPPP"
120 C$=X$
130 CALL CLEAR :: PRINT "
  WRITING": : : SEG$(C$,1,10
) : : : : : : : : :
140 REM
150 FOR X=0 TO 703
180 PRINT #1,REC X : C$
190 DISPLAY AT(12,17) : X
200 NEXT X
210 CALL CLEAR :: PRINT : "R
EADING": : : SEG$(C$,1,10) :
 : : : : : : :
220 FOR X=0 TO 703
225 INPUT #1,REC X : A$
228 DISPLAY AT(12,17) : X
230 IF C$<>A$ THEN 330
240 C=C+128
250 NEXT X
260 IF C$=P$ THEN 310
290 C$=P$ :: C=0
300 GOTO 130
310 CALL CLEAR :: PRINT "TES
T OK": : "BYTES=";C : :
320 GOTO 350
330 PRINT "** MEM FAIL AT";C
 : : "CHAR= ": : : : SEG$(C$
,1,1) : :
340 B$="B" :: IF X<256 THEN
B$="A" :: IF X>512 THEN B$="
C" :: PRINT "FILE = MEM96";B
$ : : :
345 PRINT "FILE = MEM96";B$
: : :
350 CLOSE #1
```

Double for nothing

Lou Borrelli, of Dollard des Ormeaux, Quebec, writes:

Mr. (Chris) Bobbitt's article in the September issue compares GRAPHX with TI-Artist. His conclusions prove that neither program can be said to be overall superior to the other. Depending on your particular needs, one can be preferred to the other. He says, "No clear winner; each has (its) own strengths." Let me add that, if you have both programs, however, the winner is YOU! With the Conversions program of TI-Artist 2.0, one can have the best of both worlds.

GRAPHX has two ways of working with files: Pictures and Clipart.

TI-Artist has three ways of working with files: Pictures, Instances and Fonts.

Using the GRAPHX program, you can scatter many Clipart figures over the whole screen and save it as a Picture. Similarly, using the TI-Artist program, you can do the same for both the Instances and Fonts.

The end results will be:

- Your whole Clipart collection saved as various GRAPHX Pictures (I suggest separate Pictures for animated figures and GRAPHX fonts;
- Your whole Instances collection saved as various TI-Artist Pictures;
- Your whole Fonts collection saved as various TI-Artist Pictures.

Now the *magic* begins. With the help of the TI-Artist 2.0 Conversions program (i.e. option 4 of the main menu), load the GRAPHX Pictures and save them as TI-Artist Pictures, and vice versa.

The end results now will be:

- Your whole Clipart collection saved as various TI-Artist Pictures;
- Your whole Instances collection saved as various GRAPHX Pictures;
- Your whole Fonts collection saved as GRAPHX Pictures.

The converted Pictures can now be worked on in their respective master programs. The scattered figures in the Picture can now be turned into Clipart, Instance or Font collection.

If you also have Draw-A-Bit, Draw-A-Bit II, or Draw 'n Plot, you can also have a field day in building up your library for each program. Have fun!

Disk sleeve modification

Joseph Holland, of Daytona Beach, Florida, offers an improvement to the disk sleeve program published in the September issue. Holland notes that everything works fine until the program is used to print a disk sleeve catalog that contains more than 32 program or file listings. His solution is a modification to line 1010, noting that the second command in the line, A$(B)=RPT$(" ",33) replaces the 33rd program or file in the catalog with a null strung.

Here is the modifified line:

```
1010 B=33 :: PRINT #1:RPT$("
",(B-29)*2);".";CHR$(9);CHR$
(245);"   ";A$(B);" | ";A$(B
+34);" | ";A$(B+68);CHR$(9);
```

For Epson users

And John Cline, of Washington, Pennsylvania, writes that the printer controls in the disk sleeve program are not compatible with his Epson 80 (TI Impact) printer. "By changing a few lines it will work fine. To start with, the tabs have to be changed in lines 910, 1200, 1210 and 1220. Also, to cancel condensed print changes lines 1060 and 1130. To fold at dashed lines, change all lines with CHR$(245) in them to CHR$(173). Though line 1010 is included among the changes, Cline did not make the modification recommended in the previous User Note.

He provided the necessary changes for Epson and Epson-compatible users:

```
910 DISPLAY AT(21,6):"PRINTI
NG SLEEVE" :: PRINT #1:CHR$(
27);"0";CHR$(15);CHR$(27);"M
";CHR$(10);CHR$(27);"D";CHR$
(10);CHR$(109);CHR$(0)
930 PRINT #1:CHR$(27);"U";CH
R$(1);RPT$(".",120):: B=1 ::
 PRINT #1:".";RPT$(" ",9);CH
R$(174);RPT$(" ",3);ID$;RPT$
(" ",39-LEN(ID$));"DATE: ";D
ATE$;RPT$(" ",21);
940 PRINT #1:"COMMENTS";RPT$
(" ",13);CHR$(174);RPT$(" ",
9);"." :: B=2 :: PRINT #1:".
";RPT$(" ",9);CHR$(174);RPT$
(" ",3);RPT$("-",LEN(ID$));
950 PRINT #1:RPT$(" ",39-LEN
(ID$));RPT$("-",14);RPT$(" "
,21);RPT$("-",8);RPT$(" ",13
);CHR$(174);RPT$(" ",9);"."
```

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```
970 PRINT #1:".";CHR$(9);CHR
$(174);"   ";A$(B);" ¦ ";A$(
B+34);" ¦ ";A$(B+68);CHR$(9)
;CHR$(174);"          ";"."
990 FOR B=30 TO 32 :: PRINT
#1:RPT$(" ",(B-29)*2);".";CH
R$(9);CHR$(174);"   ";A$(B);
" ¦ ";A$(B+34);" ¦ ";A$(B+68
);CHR$(9);
1000 PRINT #1:CHR$(174);RPT$
(" ",(34-B)*2-1);"." :: NEXT
 B
1010 B=33 :: A$(B)=RPT$(" ",
33):: PRINT #1:RPT$(" ",(B-2
9)*2);".";CHR$(9);CHR$(174);
A$(B);" ¦ ";A$(B+34);" ¦ ";A
$(B+68);CHR$(9);
1020 PRINT #1:CHR$(174);RPT$
(" ",(34-B)*2-1);"."
1060 PRINT #1;RPT$(" ",21);R
PT$(".",78);CHR$(27);"U";CHR
$(0):: PRINT #1:CHR$(12);CHR
$(18)
1130 IF Z$="Y" THEN 1140 ::
PRINT #1:CHR$(18):: CLOSE #1
 :: END
1200 PRINT #1:CHR$(27);CHR$(
70);CHR$(27);"B";CHR$(2);CHR
$(27);"G";TAB(10);"    Ident
ifying name:  ";ID$;TAB(65);
"Date: ";DATE$: :
1210 PRINT #1:TAB(10);"FRONT
 SIDE";TAB(32);"BACK SIDE";T
AB(55);"COMMENTS"
1220 PRINT #1:TAB(10);RPT$("
-",10);TAB(32);RPT$("-",9);T
AB(55);RPT$("-",8):: PRINT #
1:CHR$(27);"H";CHR$(15)
```

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