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MICROpendium

Covering The TI99/4A Home Computer And Compatibles

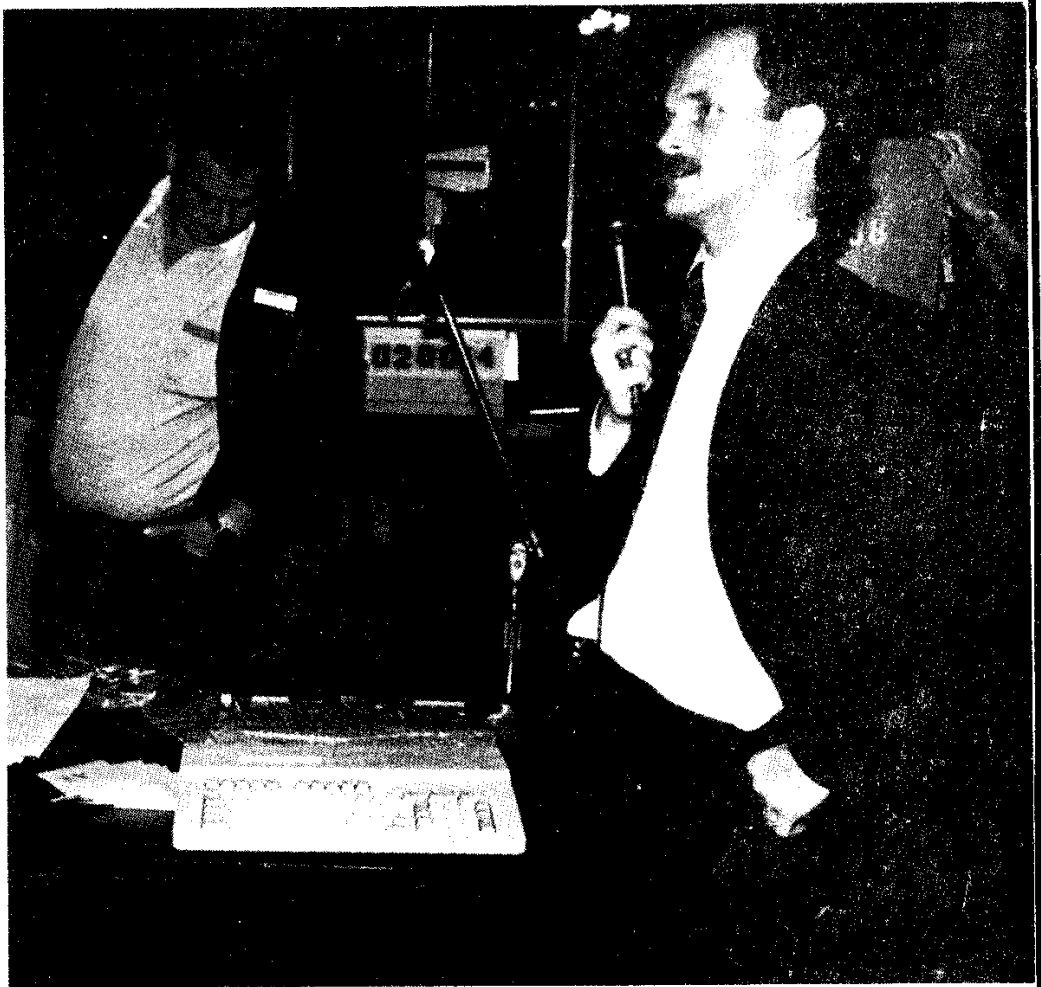
Volume 2 Number 10

November 1985

\$1.50

Inside:

Report on the TI Faire; review of the Z80A and 80-column cards; Part II of Mack McCormick's assembly language tutorial; TI users in the United Kingdom; and much more.



Lou Phillips introduces Myarc's computer



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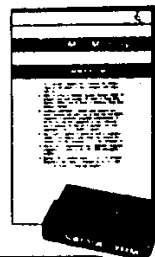
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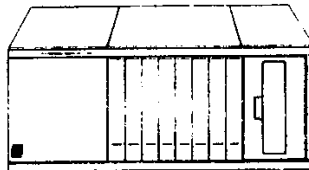
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Source: TI4596

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

Coming next month

- More about Myarc's computer
- What a Freeware author thinks of Freeware
- Review of Triple Tech

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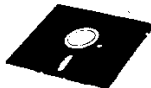
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Comments

Too much Freeware; maybe a new format

Here's a bit of a warning to advertisers and readers about the December issue. We may have to publish it in a tabloid format to get everything in. The magazine-sized pages of MICROpendium are equal to about one-half of a tabloid page. Thus, this 56-page issue would be the equivalent of a 28-page tabloid. Because of the limitations of the machine used to trim and bind MICROpendium, we are limited to 56 pages in a magazine format. However, the trimming and binding are not required in a tabloid format, so we could go up to 32 pages (the equivalent of 64 magazine pages) with no problem. We would expect to do this only once, in December, and then revert to the magazine format with 56 pages. Going to 64 pages on a permanent basis would substantially increase our postage bill for first class and air-mail subscriptions.

Regardless, the page sizes won't affect the size of ads. Everything will remain the same as it has been, for now. However, if we go to the tabloid format on a long-term basis, we will notify advertisers of new ad dimensions, etc.

MACK McCORMICK NAMED TECHNICAL EDITOR

We are very pleased to announce that Mack McCormick has been named Technical Editor of MICROpendium. This means that all of you who have sent in questions about your computer will be far more likely to get a satisfactory answer. We are currently publishing an assembly language tutorial by Mack. Mack, a major in the U.S. Army, is now stationed in Germany. He is the principal developer of the enhanced Extended BASIC expected shortly from Myarc Inc. and is a former SYSOP on CompuServe. We expect a lot of good things from Mack for our readers and welcome him aboard.

THE FINAL WORD ON FREWARE

Freeware has become too much of a good thing for MICROpendium. You'll find two pages of items in very tiny type in this issue. Unfortunately, there isn't enough space to include everything. Since we do not expect the Freeware of-

terings to diminish—nor do we expect to have enough space to publish more than two pages of listings—we will offer an alternative that seems as satisfactory as we have been able to devise. Starting in January, we will no longer publish a Freeware page in the magazine. Instead, readers may send us \$1 to receive a current Freeware listing. Readers also have the option of sending a stamped, self-addressed, business-size envelope and 50 cents (to cover the cost of printing) to receive the listing. We will update it monthly. We will make note in each issue whether any programs have been added or deleted and a brief description of new programs.

POSTSCRIPT ON TI FAIRE

The TI Faire in Chicago was a smashing success. There were many buyers and sellers and a number of interesting speakers. The Faire underscores the continuing loyalty of TI users and the commitment vendors have to meet their needs. What Miller Graphics, Myarc Inc., CorComp Inc., Foundation Computing, Morning Star Software and others are doing for hardware, a great many more companies, some consisting of no more than one person, are doing for software. Some, such as Oaktree Systems and Techni-Graphics, among others, were at the Faire to demonstrate their products. Most others, unfortunately, were not there. My impression is that anyone with a useful TI product to sell would have done well at the Chicago TI Faire. (My personal "best buy" was a terminal emulator called M-Transfer that I will probably review in the near future. It cost only \$10 and supports virtually every feature I expect from a terminal emulator.) The Los Angeles TI users group is planning a fair next year, and we hope it is as well organized and publicized as the Chicago TI Faire. Terrie Masters, president of the L.A. group, was in Chicago and no doubt is ready to set the L.A. fair on fire. There's a lot going on among TI users and we are dedicated to providing information about all of them.

—JK

Reviewed in MICROpendium

1984

February: B-1 Nuclear Bomber, Tandon TM-100 Disk Drive, Void, Beanstalk Adventure, Microsurgeon, On Gaming, Database 500
March: Star Trek, Escape From Balthazar, Garkon's Getaway, Sky Diver, Mail-Call, Pro-writer 8510 Printer
April: Monthly Budget\$ Master, Budget Master, Home Budget, Thief, Donkey Kong, Khe Sanh
May: Companion Word Processor, Q*Bert, Mad-Dog I & II, Programs for the TI Home Computer
June: Creative Expressions Accounts Receivable/Accounts Payable, CDC 9409 Disk Drive, Starship Concord, Lost Treasure of the Aztec, ASW Tactics II
July: Theon Raiders, Introduction to Assembly

Language for the TI Home Computer, Game of Wit, Pole Position
August: TE-1200, Tower, Galactic Battle, Galaxy
September: Wycove Forth, 99/4 Auto Spell-Check, QUICK-COPYer, Wizard's Dominion, Anchor Automation Mk XII Modem
October: Killer Caterpillar, ZORK I, Defender
November: 9900 Disk Controller Card/Manager, Super Bugger, Transtar 120S printer, Floppy-Copy, Data Base-X
December: Gravity Master, Data Base Manager System, Learning 99/4A Assembly Language Programming

1985

January: Super Sketch, Foundation Computing 128K Card, PTERM-99, TI-Runner

February: Super Extended BASIC, Beginning Assembly Language For the TI, ZORK II
March: Morning Star Software CP/M Card, WDS/100 Winchester Disk Drive, Sketch Mate, BMC Color Monitor
April: 9900 Micro Expansion System, Disk + Aid, Gemini 10X-15X
May: Character Sets and Graphics Design, Draw 'N Plot
June: GRAPHX, DATA BASE I
July: Acorn 99, Advanced Diagnostics
August: Model Dow-4 Gazelle, Ti-Artist, PC-KEYS, Not-Polyoptics' Bankroll
September: Midnite Mason, Myarc 32K/128K Card, GRAPHX Companion
October: 4A/TALK, Extended BASIC II Plus, XB Detective, Console Writer 2.1

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

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

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

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

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

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Feedback

Getting official

I am a subscriber and have greatly enjoyed every issue of your magazine. Could you tell me how a group can become an official TI users group?

Terrence P. Murphy
President
Melville Users Group
Selden, New York

TI discontinued support of user groups when it left the home computer market. It is not possible to become an "official," TI-recognized group.—Ed.

Solder connections

In response to Stanley Page's lockup problem, I had a similar experience with various modules. I am an electronics technician so I fixed it myself but anyone who can solder can do the same.

The problem is caused by a couple of poor solder connections on the cartridge slot board. To check for the problem, insert a module—preferable one with a blinking cursor or movement. Raise the front of the computer console about an inch off the table and let it drop. If the connections are good, the most that will happen is that the cursor will move one space due to space bar bounce. If lockup occurs, the connections are poor and need to be resoldered.

Disassemble the console and remove the cartridge slot assembly. Hold it so you are looking into the module slot. Just above the slot on the right and the left are two "feed-thrus." These are two pieces of wire that go through holes in the board and electrically join the large foil areas on both sides of the board. Flowing some fresh solder on these points cured my problem. Be sure to use a 50 Watt iron or less to avoid melting the plastic slot.

David L. Swancer
Medina, Ohio

Mini-Memory speech

Can anyone tell me how to use the Mini-Memory module as a "speech

editor" to replace that module, which is not available from any source I can find.

I have the TI "Speak & Spell" program, and no speech editor module.

This should make a very good substitute, and could be loaded direct, as shown in the MM manual, from either cassette or disk, directly into the MM module, then accessed from TI BASIC with the MM module inserted.

I hope some programmer knows how to do the above trick for me, as I wish to use that program, and purchased it without knowing that it required the "TI Speech Editor" to work.

Edward R. Mashburn
Roberta, Georgia

Which comes first?

My desire is to expand my computer's capabilities through addition of both cartridges and peripheral equipment. Would you be so kind as to make a suggestion as to what should be purchased first? My impression is that Extended BASIC should come first but from there on there's really not enough knowledge even to form an opinion since I don't know what will work for me without a PEB. Can I increase memory without the PEB and do I really need increased memory at this point?

John R. Finn
Fort Myers, Florida

Extended BASIC is definitely first. X BASIC offers much faster run times than console BASIC and supports many more programming conventions. Next, I recommend a disk drive. A disk drive is much faster and more convenient to use than a cassette recorder. (Of course, a disk drive also requires a disk controller, which increases the cost.) While an expansion memory is very useful, it is third on my list of expansion options. There are stand-alone expansion memories and stand-alone disk systems available, as well as mini-expansion systems that offer an alternative to a Peripheral Expansion Box.

Prices on these items varies, depending on whether you are purchasing new or used equipment. Prices on

many new cards for the Peripheral Expansion Box are quite reasonable, though obtaining a new PEB may pose a bit of a problem. Expect to pay about \$125 for a PEB. Check out the ads in MICROpendium to get a good idea of what you would expect to pay.—Ed.

4A/Talk feature

One excellent feature of [4A/Talk] ...is often overlooked....That feature is in the use of the capture buffer and keyboard files to pre-write messages for upload to the message input area of a BBS.

The procedure is as follows:

After the program has loaded and you have finished with the default screen you enter FCTN 3 for half duplex. Then enter FCTN 4 to open the capture buffer. Now you can write a message using 40 character lines and FCTN X for a CR/LF to advance to the next line. You can continue to write your message and when done you select FCTN 5 and option 1 to save the buffer to disk. Now, after signing on to a BBS you go to the message input area and enter the message header information. When you come to the area where you input the body of the message you may use one of two methods to enter the message. If the BBS system only allows you to enter one line at a time, like TIBBS, you do the following:

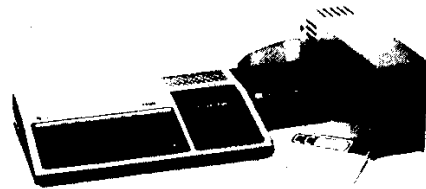
Select FCTN 6 and option 1, Open a keyboard file. Enter the filename that you gave your message and then press enter. Now press FCTN D twice with a pause in between. On the second entry the first line of your message will appear on the screen. Continue to press FCTN D and your message will be entered one line at a time. When done press enter and the BBS's options to save, edit etc. will appear and you can choose the one you wish.

If you are on a board that allows block input for messages, like TBBS then the procedure is as follows:

Input the message header information as before. Now select FCTN 6 and take option 3, Set up XON/XOFF characters and enter 17 for XON and

(Please turn to Page 10)

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Feedback

(Continued from Page 8)

19 for XOFF. Now enter FCTN 6 again and select 1, Open a keyboard file. Enter the filename of your message file and press enter. Now the first time you enter FCTN D your entire message will be entered. To stop and start it as it is going in press FCTN D. When done press enter and select whatever option you wish.

Whether or not you select full or half duplex (FCTN 3) during this operation depends on whether the host has local echo on or off during the upload. TBBS, for example, turns it off during unprompted block uploads so you must go half duplex. On most boards, however, full duplex is the proper selection. Using the above procedures you can also read other variable 80 files that you have downloaded from other systems. The use of the keyboard files section of 4A/Talk greatly increases its versatility.

One final note: with some modems you may have to experiment to find out how to get the text entry portion of the procedure to work. It works fine on the Radio Shack modem 1 and Volksmodem 12 modems I have but I had to put an on/off switch in the phone line for a friend of mine who uses a 300 baud Volksmodem. In any event, to see how the procedure works using any modem you can simply disconnect your modem from the RS232 if you have a problem with text entry and try it out. If you like the procedure, then you can do whatever is necessary to make it work with the modem hooked up.

Joe Nuvolini
Colorado Springs, Colorado

User friendly

In the evaluation of software, the issue of principal importance is whether or not it is user friendly. Being user friendly means that examples of application either in printed form or on an unprotected diskette must be available and clearly identified so they

can be studied.

Users of the 99 range from professional programmers to individuals who use their machine for computation, word processing, graphics or games, etc. A software based on either BASIC or Extended BASIC should be so designed that a user can apply the technology without any hitches or problems. For example, TI's "TI-Writer" package and Extended BASIC I would say meet this criterion rather well, while the Editor-Assembler is significantly more difficult.

I believe that very strict standards should be applied to determine user-friendliness—it isn't right to have a package evaluated by an individual more expert than the expected user level, and that level should be defined precisely. Unless this criterion of friendliness is met, a review should clearly state the level required, or only user friendliness level should be reported in a review.

A reader of such a review where such a clear statement is not made, and who buys a pack that offers problems, is going to throw *all reviews* into question, and the result will also reflect onto the producer of the software.

I recently got stung in just this way by a review in MICRO. Now, I don't know what to believe. The software in question was not user-friendly for me, and it took an experienced programmer friend over an hour to unlock one of the simpler programs. I had spent a good many hours trying to solve the riddle, to no avail. (I was given only a partial refund because I tried in earnest too long.)

Granted, once you know the pattern, an associated program application may be simple, but unless the details are sufficiently complete, a great deal of time can be lost getting such responses as "SYNTAX ERROR" or "CAN'T DO THAT." If one has plenty of time to sidetrack one's use of the computer and accept the challenges, that's OK. But I for one, and I suspect many other possible users, don't have the time to accept such a challenge.

Please...have people of appropriate skills check the system before

review.... It is useful for your readers to know you are instituting such a procedure.

Keats A. Pullen
Kingsville, Maryland

Sorry to hear about the problems you've encountered. The term "user friendly" is difficult to quantify and often depends on the documentation that comes with a product as much as the design of the product itself. Most reviews do make note of how difficult particular products may be to use. However, not all do. We will strive to make distinctions about user friendliness in the future. When in doubt, it may be wise to contact the vendor. As a general rule, applications and game programs are generally accessible to most users while programming utilities may require specialized knowledge or interest on the part of potential users. We will try to do better in the future.—Ed.

Shugart drives

I have been trying for some time now to locate schematic diagrams for my TI PHP-1250 internal disk drive, which is actually a Shugart 400L drive. Shugart has gone out of business and TI has been unable to help me on this.

I would appreciate any information you or your readers can provide on where I may obtain a set of schematics for this drive. I have been able to obtain schematics on all the other peripheral equipment, but not this drive.

Sam P. Smith
Lubbock, Texas

Any readers have the schematic's Mr. Smith is looking for? Please write and we'll let him know.—Ed.

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

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New computer? 1,700 attend 3rd TI Faire

While there was some disappointment when a new TI compatible computer failed to be introduced, most of the 1,700 visitors at the third annual Chicago TI Home Computer Faire got more than their money's worth by the end of the seven-hour session.

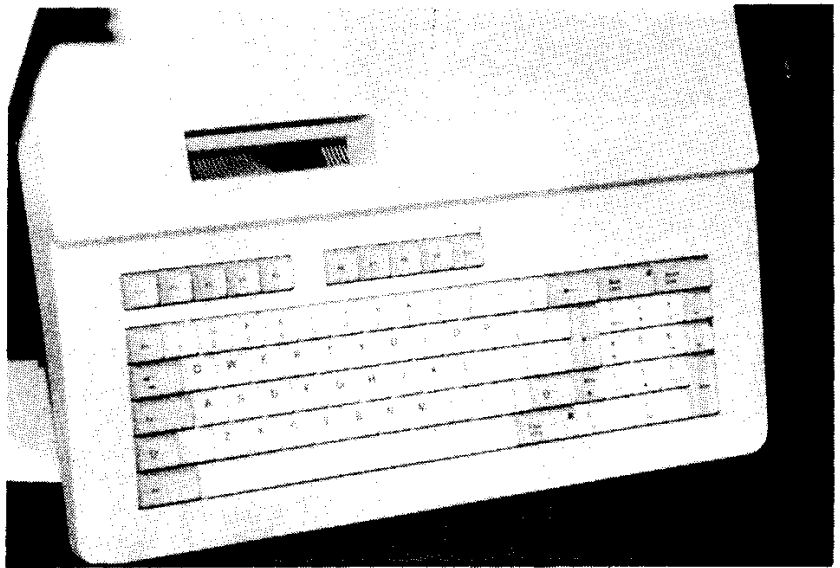
Held Nov. 2 on the campus of Triton College in River Grove, a western suburb of Chicago, the Faire featured 27 vendors in the exhibition hall. Hundreds attended product-oriented sessions held by Craig Miller, Lou Phillips and John Clulow. Richard Mitchell, of Bytemaster Computer Services, hosted a seminar on using Extended BASIC to access and create files for Microsoft Multiplan.

The biggest news of the day turned out to be something that didn't happen: there was no new working computer to replace the TI99/4A. The hundreds who packed the meeting room where Phillips, president of Myarc Inc., was expected to unveil the new computer were somewhat dismayed when Phillips started his mid-afternoon session by discussing the history of his company.

However, though a working computer was not available, Phillips described the console the company is working on and displayed an empty console and a motherboard that he said will be turned into a new computer by the January Consumer Electronics Show. Cost of the machine is expected to be in the \$450 range.

Myarc also failed to demonstrate its ballyhooed Extended BASIC upgrade because one of 10 disks containing segments of the program had been left behind at the company's headquarters in New Jersey. The company maintains that distribution of the Extended BASIC upgrade will begin this month.

(Please turn to Page 14)



Pictured is the prototype keyboard of Myarc's TI-compatible computer. The new machine is expected to include 256K of RAM and be compatible with 95 percent of existing TI software.

Myarc outlines plans for 256K computer

The introduction of the prototype keyboard of a new TI99/4A-compatible computer by Myarc Inc. was greeted by a wave of applause from hundreds at the Chicago TI Faire. Lou Phillips, president of Myarc, said of the machine, "this is what we want to see come out the first quarter of next year."

Although the machine does not work at this time, Phillips said it will include 256K of RAM (expandable to 2 megabytes), 64K bytes of VDP RAM, 64K of ROM, parallel output, RS232 port, two internal expansion slots and a cartridge slot mounted on the top of the computer. Phillips said the computer will also support a mouse.

The central processor used in the new computer is the TMS9995, which Phillips described as "very similar to the 9900, only about 2.3 times faster." The 9995 processor, which was first marketed in 1981, is "just as fast as a Motorola 68000 running at 6 megahertz." The 9938 video display

processor will also be used. (The 9938 is being produced in Japan and supports 512 colors, compared to the 16 supported by the TMS9918 used in the 99/4A. The 9938 is compatible with the 9918, Phillips said. The chip also supports an 80-column display.)

Myarc has yet to select a name for the computer, but the choice may be a play on the company's name, which stands for Microcomputer Architects. "Noah" has been suggested as an appropriate name for the computer.

While little is known about compatibility with existing TI hardware, Phillips noted that it will operate with the company's expansion memory card, using the TI Peripheral Expansion Box as a card cage. The console will be connected to the PEB using a flexible cable, replacing the stiff ribbon cable used to attach the 99/4A to the PEB.

Next month's MICROpendium will include a more complete description of the computer.

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6. Entries will be judged by James Hollender, the author of Super Extended Basic. Entries will be judged on the following criteria:
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8. All entries become the property of J & K H Software and none will be returned. Winners will be notified by mail on or about June 1st, 1986. Any taxes on the prizes shall be the sole responsibility of the winners.
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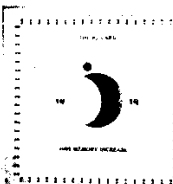
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Some 1,700 visitors jammed the exhibition hall at the third annual Chicago TI Faire. The crowds in front of exhibitor booths were three deep for most of the day.

TI FAIRE—

(Continued from Page 12)

The most fully realized product demonstrated at the show was Miller Graphics' GRAM Kracker. Miller captivated an audience of well over a hundred for more than an hour during a morning session.

The demonstration of the working GRAM Kracker was nothing short of amazing. The device, which fits into the cartridge slot of the TI, allows users to dump the contents of cartridges into memory and then save them to disk, RAM disk, hard disk or cassette. About 15 cartridges can be saved to a double-sided, double-density disk. These programs may then be called up at any time for use. The device also allows users to manipulate these programs. For

(Please turn to Page 16)

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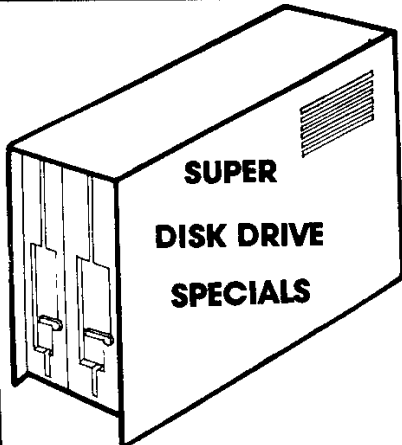
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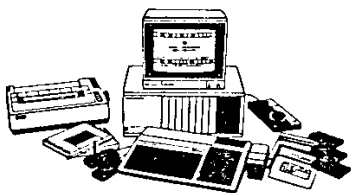
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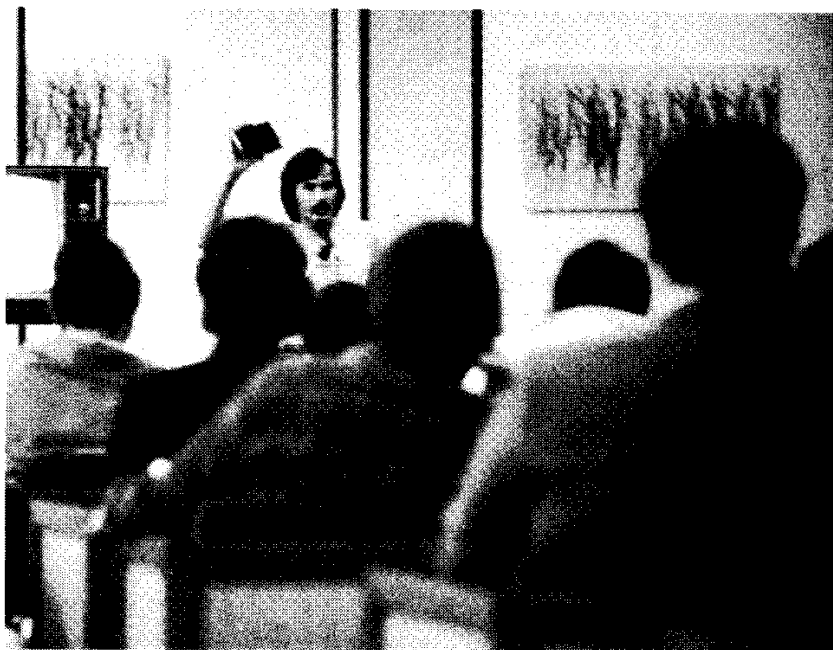
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Craig Miller, of Miller's Graphics, holds his company's GRAM Kracker while describing it to a large, appreciative audience of enthusiasts. The product is expected to be delivered to initial purchasers this month.

GRAM KRACKER—

(Continued from Page 14)

example, Miller said, users may decide to change the default colors of Extended BASIC. Using the GRAM Kracker, this would be easy. Cartridge-based programs such as Tax Investment Record Keeping, which allow only output to serial printers, may be modified by the user to allow output to parallel printers.

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device also allows users to manipulate these programs. For example, Miller said, users may decide to change the default colors of Extended BASIC. Using the GRAM Kracker, this would be easy. Cartridge-based programs such as Tax Investment Record Keeping, which allow only output to serial printers, may be modified by the user to allow output to parallel printers.

To dump a cartridge's memory contents into the GRAM Kracker, the user simply inserts the cartridge into a socket on the top of the device and follows very simple instructions to carry out the task.

Miller notes that the device opens up an entirely new area of memory for programming and modification and allows programming in TI's proprietary Graphics Programming Language (GPL).

The device contains 16 kilobytes of battery-backed cartridge RAM and 40K of battery-backed GRAM. The system is user-expandable to 80K.

(Please turn to Page 18)



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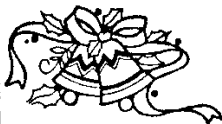
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NOTE: Payment in full must accompany all orders. Credit Card, Company Check or Money Order for immediate shipment. Personal checks require up to 4 weeks to clear. California orders add 8 1/4% sales tax.



BATTERY-BACKED RAM DISK—

(Continued from Page 16)

System software is stored in an 8K ROM/GROM.

The device costs \$174.95 plus shipping and handling. Contact Millers Graphics at 1475 W. Cypress Ave., San Dimas, CA 91773, (714) 599-1431.

A number of other products were being marketed or displayed in the exhibition hall, including a RAM disk by the New Horizons Computer Users Group, a replacement keyboard for \$25 by a Chicago company—Hunter Electronics, 604 S. Fairview, Elmhurst, IL 60126—that included a second FCTN key on the left side to facilitate typing, and a portable TI99/4A designed and built by an Ohio man that includes two half-height disk drives, a four-inch monochrome monitor, expansion memory, RS232 and parallel ports and, of course, the keyboard.

Most booths were devoted to sales and represented a variety of products,

ranging from telecommunications (CompuServe) to inventories of TI software and hardware. One booth that attracted many Faire-goers was stocked with third-party software and gadgets and a selection of hard-to-get p-code cards.

The Horizon RAMdisk, developed by John Clulow, Ron Gries and David Romer, starts at 104K and is expandable to 192K, the equivalent of a double-sided floppy. The user group says the card is compatible with all TI99/4A software. The UG says it is the only battery-backed RAMdisk for the TI, using a Ni-cad battery that charges while the computer is running. Other features allow the user to determine the RAMdisk drive number, the maximum number of sectors, write protection, turn on CRU for direct device service routine (DSR) access and execute machine code from BASIC.

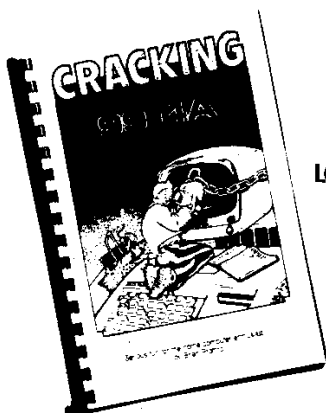
The card comes with complete DSR

source code and manual and a schematic diagram. It is available as a ready-to-run card, as a bare printed circuit board with parts list and instructions and as a schematic diagram with parts list. All packages include the operating system and source code, documentation and development software. For price and order information, write to Romer at Box 554, Walbridge, OH 43465.

The Chicago TI Users Group has already scheduled a fourth Faire, for the first week of November next year. The sponsors note that this year's Faire set records for spectator information and vendor participation.

A three-hour videotape of the Faire, including the major speakers as well as events occurring in the exhibition hall, is available from the Chicago TI group in either Beta or VHS (specify) format for \$25. The group's address is P.O. Box 578341, Chicago, IL 60657.

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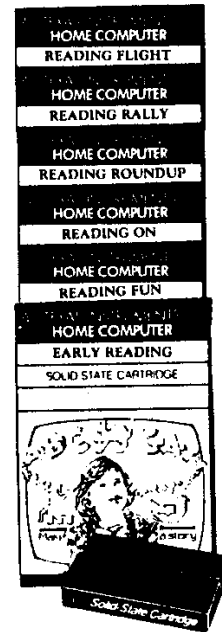
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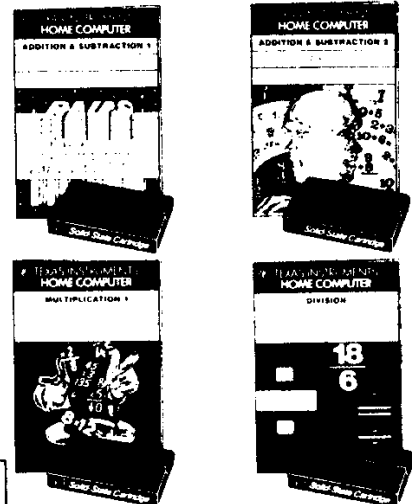
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The sysops of CompuServe's TI Forum

*Your friend,
Mack*

Members of CompuServe's TI Forum who post a technical question often receive a knowledgeable reply signed this way.

The writer is Mack McCormick, until recently a sysop on CompuServe's TI Forum.

McCormick, whose articles and tutorials remain on file in the TI Forum's data libraries, is leaving the Forum because he is leaving the country for a three-year assignment in Germany near Stuttgart as an infantryman. Along with his transfer from Virginia, which occurs Nov. 22, he will soon be moving up from captain to major in the U.S. Army.

McCormick, 32 years old, was born and reared in Mobile, Alabama. He was graduated from the University of Alabama with a major in computer science and then entered the Army. He is soon to be awarded a master's degree in logistics management from the Florida Institute of Technology.

McCormick says he got involved with the TI "about 2½ years ago." Stationed in Columbus, Georgia, he joined the Valley 99'ers Users Group, whose president, Ron Albright, "got me into calling bulletin boards and convinced me to join CompuServe."

Approximately one year ago McCormick became a sysop, specializing in aiding other users with assembly language and hardware and technical questions.

"Ron and I became sysops at the same time," he recalls. "Ron nominated me."

McCormick recently presented a seminar to the Philadelphia Users Group.

"The thing I most enjoy is the personal contact," he says.

While in Germany, McCormick says, he "won't be out of touch."

**Access CompuServe
At the prompt, type:
GO TEX 200**

J&KH offering \$400 in programming contest

J & K H Software is sponsoring a programming contest. Prizes are \$250 for first place, \$100 for second and \$50 for third.

Programs must be written in Extended BASIC and use CALL LINK statements to access SUPER EXTENDED BASIC assembly language subroutines.

Entries must be sent no later than March 31, 1986, and received no later than April 7, 1986. Entries must be submitted on SS/SD disk along with name, address and phone number. Entries should include written documentation if it is needed. One program per contest entry is allowed. Entries may be sent to SXB Programming Contest, 4911 S. 31st St., Arlington, VA 22206.

Programs entered in the contest must be the original work of the auth-

ors and may not have been published. Programs must be put in the public domain. Neither the authors nor J & K H Software will claim copyright or any other rights.

James Hollender, author of Super Extended BASIC, will be the judge of the contest.

Only one prize will be awarded per person. Prizes will be awarded on or about June 1, 1986.

J & K H Software will include the prize-winning programs as examples with the full Super Extended BASIC package. Anyone will be able to order a copy of the prize-winning programs for the cost of materials, duplication, packing and shipping (probably \$5) from J & K H Software, 4911 31st St., Arlington, VA 22206.

99/4A helps quake victims keep in touch

The TI99/4A helped some of the survivors of the recent Mexico City earthquake send word of their safety to relatives in Los Angeles, despite disruption of telephone communications.

Jerry Price of Tex-Comp said that about four days after the earthquake, the company received a disk with no explanation from a customer in Mexico City. The customer had entrusted the disk to a Western Airlines stewardess who took it to Los Angeles.

On examination, the disk proved to

have messages on it from about 30 Mexico City residents to relatives in the Greater Los Angeles area, informing them that they were safe, Price said.

With the help of a Spanish-speaking Tex-Comp employee, word was passed to all the Los Angeles relatives, Price said.

"We were careful how we worded it when we called them, since it was about the earthquake," Price said. "We started out, 'We have good news for you from your relatives.' It's sort of neat to think that the TI played a role in that."

CorComp releases plug-in interrupt switch

CorComp has released a plug-in load interrupt switch designed to be used with utility programs which require a hardware switch for the screen dump.

According to Jackirae Sagouspe, CorComp president, the program loads in Extended BASIC or the Editor/Assembler load and run option.

The switch plugs into the I/O switch at the side of the console between the console and any expansion device, she

said. She noted that the switch may remain installed without the utility program utilizing it being installed as long as the switch is not pressed. The switch has been tested with a number of public domain programs and programs from Quality 99 Software, she noted. Suggested retail price is \$12.

For further information, contact CorComp Inc., 1255 N. Tustin Ave., Anaheim, CA 92807 or (714) 630-2903.

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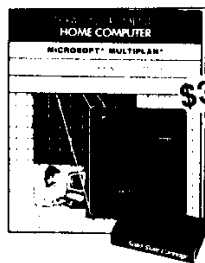
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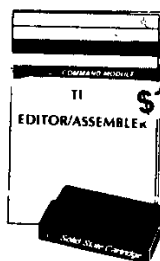
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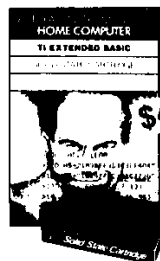
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This is the **complete** version with manual, module program disk and the disk version of Tombstone City as an example of assembly language programming. 32k and disk drive are required. This package will allow you to program the 99/4A in TMS 9900 Assembly Language and gives you access to all system features. Provides the fastest speed possible from the 16-bit processor!

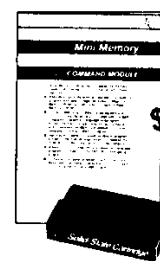
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Vaughn Software leaving TI market

Vaughn Software has left the TI market and Vaughn Software programs for the TI will be marketed by IEC of Denver.

David Vaughn of Vaughn Software says that the advent of some new computers played a part in his decision to leave the TI market.

Computers such as the Amiga and the 520ST, he says, represent "512K just sitting out there empty." Vaughn also noted that there is "less and less response for programs for the TI99/4A."

Programs written by Vaughn to be marketed by IEC are Bitmac, a graphics program; Zapcode, a mailing list program intended for fast retrieval from up to four disks; and Printpack I, a companion for Bitmac which contains an introduction and sample graphics and allows an "extra large print" of Bitmac characters.

Joe Miller of IEC said that his firm would provide Bitmac at a suggested

retail price of \$29.95 and would distribute Printpack I as freeware. Price for Zapcode had not been determined.

Miller noted that IEC also sells Midnite Mason from Software Specialties.

He said the firm has only recently gone into marketing software for the TI, though they have been selling ca-

KCI publishes computer services directory

A new "Computerized Services Directory has been compiled by KCI Communications of Paramount, California.

Said by the publisher to be especially targeted to the noncomputing customer, the directory is called "a comprehensive listing of services that are available from firms throughout the United States offering computerized services.

Free listings are currently being offered to computer owners. Computer owners with services to offer may write or call for a Profile Sheet by sending a

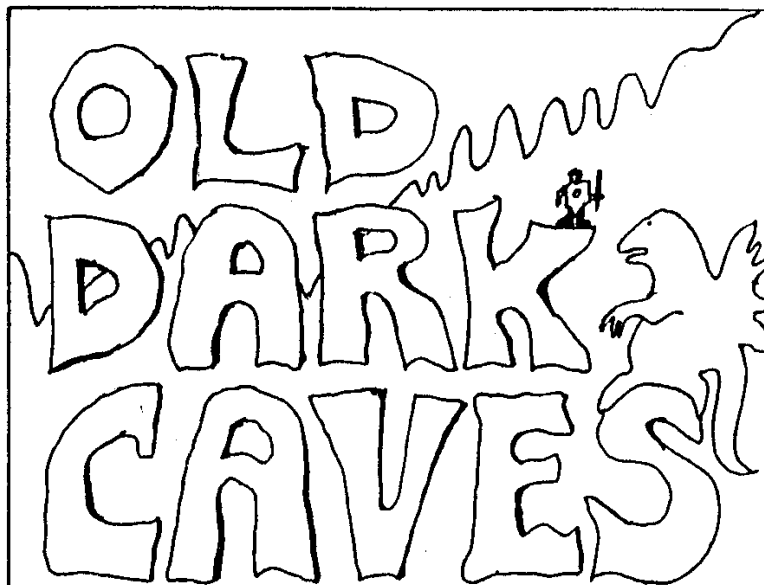
bles for it for "quite a while." He said the firm is interested in reviewing good, low-priced software from authors with the possibility of marketing it.

For further information, contact IEC, 4150 Fox Street Unit #A5, Denver, CO 80216 or (303) 458-5600.

self-addressed stamped envelope to KCI — Dept. CU, P.O. Box 1084, Paramount CA 90723 or phoning (213) 638-7235.

KCI officials say that when they receive the Profile Sheet the listing will be placed in their data base immediately for possible referrals.

Although there is no charge for the listing, the firm says persons may send a donation of \$5 "or whatever their conscience dictates," and such contributors will receive a copy of the directory and be notified when updates are available.



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T.O.D. EDITOR

The TUNNELS OF DOOM cartridge is perhaps the ultimate adventure for the TI-99/4A. It's three-dimensional graphics and adventure action are unparalleled by any other software for the TI Home Computer. However, until recently, the avid player was limited to only the two games this cartridge came with. Now, for the first time ever, you can create your own games for this module with ASGARD SOFTWARE's TOD EDITOR.

This high-quality, menu-driven utility program requires no programming knowledge or skill whatsoever, yet the user can create interesting games as complicated as desired almost immediately. TOD EDITOR is so easy to use you will be able to write your own quests soon as you open the package.

You can create your own adventures easily and relatively quickly by either encoding your favorite fantasy games and books, or by drawing on your own fertile imagination. With TOD EDITOR you can modify virtually every aspect of your quest, from the graphics to the monsters, to the treasures to the spells at the touch of a key. Games created with this useful utility can be freely traded, exchanged or sold without the bother of licensing agreement. ASGARD SOFTWARE will even evaluate your game, free of charge, for marketing potential if you so wish. Imagine becoming a software author without even knowing a programming language!

TOD EDITOR includes a free sample game created with this program by it's author John Behnke, a backup disk for the program, and an extensive user's guide and tutorial for learning and using TOD EDITOR. The program requires an Extended BASIC cartridge, a 32K memory expansion device, and a disk drive system. The sample game and the games created with this program additionally require the TUNNELS OF DOOM cartridge by Texas Instruments Inc.

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Sun to set on British TI use?

By CHARLES ALVERSON

Despite the fact that the number of TI99/4A computers in the United Kingdom has risen to 70,000 since it was introduced here in 1981, the model could be all but extinct here within the next three years.

That's the opinion of Clive Scally, editor of *TI*MES*, the quarterly, 60-page magazine of TI99/4a EXCHANGE, the national users organization in the United Kingdom. And if this happens, he reckons, most of the blame can be laid at the feet of Texas Instruments. First, he says, because of the company's failure to mount a proper marketing operation here. "Users could be up in the millions in the UK," Scally says, "if Texas Instruments had really pushed the 99/4A here."

Perhaps as important, he adds, is the lack of technological innovation from

the company and sufficiently expanded capability for the 99/4A. "Our experience has shown that the 99/4A is a serious users' computer," Scally says. "And with the technology of other computer makers improving and prices falling generally, there's going to reach a point—unless TI comes up with something remarkable in the way of capability expansion—where users will drift into other hardware if it will take their existing hardware. A new computer which would take even 70 percent of TI99/4A software would be a real temptation to many users."

Another cause of the potential decline of the 99/4A, Scally says, is software piracy which, despite recent legislation, he calls epidemic in the UK. "Piracy has contributed greatly to the decline of the 99/4A's growth in this country," he says, "and as a group we condemn it strongly."

Scally says that the decline of the 99/4A is reflected in the dwindling membership of EXCHANGE which has slipped from 1,000 at its highest to about 800, and the fact that the membership renewal rate is currently running at only 70 percent.

But despite this, the remaining members are proving a faithful lot who will turn out to learn, teach and swap experiences. In the last year, the group has held three user shows in major cities around Britain, and has averaged around 800. The latest was held in Birmingham Oct. 26. These user shows include de-bugging clinics and auction swaps of hardware and software as well as a good deal of socializing.

Scally says that a hard core of about 20 EXCHANGE members write for *TI*MES* and help out at the conventions, and that they will carry on as
(Please turn to Page 25)

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TI IN THE UNITED KINGDOM—

(Continued from Page 24)

long as users indicate that there is a need. The group started with only 30 members in 1982.

Currently, Scally and his wife Audrey answer telephone queries from users from 7:30 to 10:30 each weekday evening, fielding at least half a dozen calls a night. "We can solve most problems through our area contact network," Scally says. But he adds, "We discourage calls after 10:30. About the only reason a member would call that late would be if his computer blew up completely and he needed comforting." Other hours, the member hotline is connected to an answering machine.

The Scallys live in Brighton on the South Coast where Scally makes his living as an area manager for a major British retailing chain. He emphasizes that EXCHANGE is very much a non-profit organization and that advertis-

ing in *TI*MES* is carried strictly as a service to members and to meet the costs of printing and distribution. "For me and the majority of group members," he says, "it's just an extension of a seriously held hobby."

At present, 99/4A users get most of their support from two major TI dealers, one in Manchester in the north of England and the other in Devon in the West Country. There are also three software houses, but fatalities among these tend to be high, with two going out of business in the last year.

Texas Instruments' UK headquarters in Bedford, about 45 miles north of London, provides 99/4A support in the form of repairs, parts and technical publications, but Scally says that TI-Bedford is more interested in the calculator and professional computer side of the business and refers home computer queries to the user group and to regional dealers (A telephone call I made to

TI-Bedford in the course of writing this article was not returned.)

Users help each other through the pages of *TI*MES* and at the national user shows as well as through local user groups. There are currently, Scally estimates, some 20 local 99/4A user groups around the UK and hundreds of general home computer groups users can join.

The problems of owning a 99/4A in the UK today are complicated, Scally says, by the fact that there are currently no magazines available specifically for users. One major magazine, *Personal Computer News*, a weekly which used to devote some 14 percent of its space to TI computers, recently folded, leaving a vacuum which has not been filled by occasional write-ups in other computer magazines.

To try to make up for this loss, 99/4A users have fallen back on maga-
(Please turn to Page 26)

TI-994A —————> IBM-PC ? PEP!

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TI IN THE UNITED KINGDOM—

(Continued from Page 25)

zines from the United States and mail order, but find that the twin bogies of shipping delays and high postal charges are real problems. "Our users are really starved for good international 99/4A coverages," Scally says.

Nor have 99/4A international support groups a good name here for reliability, Scally says. "We were badly let down by Charles La Fara's International User Group in Bethany, Oklahoma," he says, "and feel badly in need of such a group which would really be effective." He adds that al-

though the large groups operating in the USA, Canada and Australia are now the lifeline of the TI99/4A, there should also be a world-wide organization coordinating TI group resources in the development of a new generation of the computer.

But despite his grouses, Scally reckons that support from Texas Instruments here in the UK is "expensive but reliable" even if the company does tend to consider home computer users second-class citizens compared to their other customers. He sums the situation up by saying that he'd feel more

optimistic about Texas Instruments and the future of the 99/4A if the company could be seen to be more positively oriented toward both technological development of a new generation of the computer and aggressively marketing it worldwide.

XBASIC only

Warren Agee, who reviewed XB Detective in the September 1985 issue, informs us of an error in his review. The program loads in Extended BASIC only, not into console BASIC with Editor/Assembler or Mini-Memory.

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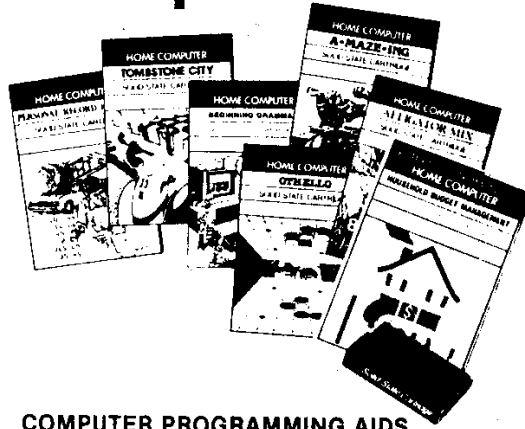
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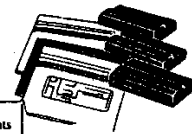
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Assembly language tutorial, part 2

Using SBUG to debug assembly language programs

By MACK McCORMICK

Technical Editor

This tutorial will describe how to use the TI SBUG program to debug your assembly language programs. Although specifically written for SBUG, the principles apply to the other debuggers on the market.

As I you have already discovered, the familiar error messages and helps that are found in BASIC are not available in Assembler. I know many of you have typed in my first tutorial or used one of the beginning assembly language books on the market and had difficulty getting the program to run properly. Take heart, we all had the same problems when we were learning. Until you master the use of one of the debugging programs you may pull your hair out and may eventually give up.

As I have already mentioned, there are several very good debugging programs available for the TI. Briefly, here they are:

DEBUG is the program supplied with your Editor/Assembler cartridge. It has many helpful features, particularly the ones that allow you to set CRU bits, move memory, and compare memory. My main criticism of DEBUG is its inability to single-step through instructions.

BUGOUT, written by Gregg Wonderly, is also very good. It offers multiple fields of information on the screen at the same time. It has many advanced features, such as dumping to disk. It is the most advanced that I have used. My main criticism is that it maps the VDP to text mode which interferes with VDP mapping for the screen image table and color table if you need to inspect these locations in your program.

The debugging program I use the most is SBUG. This is the Super

(Please turn to Page 32)

```
*****
*
* This program shows
* how to redefine characters, place
* them on the screen, and change the
* color of each character set
* Entry Point -> START
* Must be run from E/A or MM Load & Run
* R0-R2 Used for general VDP access
* R3 Used as a general purpose counter
* R11 contains the return address on
* entry.
* by Mack McCormick
*
*****

DEF START          DEFINE THE ENTRY POINT OF THE PROGRAM
REF VMBW,VSBW,VNTR SYSTEM UTILITIES WE WILL USE

* DATA STATEMENTS *

SAVRTN DATA 0      SET ASIDE A WORD OF MEMORY TO SAVE THE RETURN ADDRESS
BORDER DATA >8080,>2020,>2020,>2020 CHAR >80 WILL BE OUR BORDER
DATA >2020,>2020,>2020,>2020
DATA >2020,>2020,>2020,>2020
DATA >2020,>2020,>2020,>8080
PATRN DATA >3C7E,>FFFF,>FFFF,>7E3C

STATUS EQU >837C    LOCATION OF THE GPL STATUS BYTE
*
* WS BSS >20         THIS EQUATES THE LABEL STATUS TO THIS ADDRESS
*                   SET ASIDE 32 BYTES OF MEMORY FOR OUR WORKSPACE

MSG TEXT 'THIS IS A TEST' 14 BYTES LONG
EVEN                FORCES THE PROGRAM COUNTER TO AN EVEN MEMORY ADDRESS.
* AS A GENERAL RULE ALWAYS USE EVEN AFTER THE LAST BYTE, BSS, OR TEXT OPCODE.

START MOV R11,@SAVRTN MOV THE ADDR IN R11 TO THE WORD OF MEMORY AT SAVRTN
LWPI WS             TELL THE HARDWARE WORKSPACE REGISTER WHERE YOUR WS IS

*--PUT A BLUE BORDER AROUND THE SCREEN--*

LI R0,>0705          07 IS VDP REG 7 OR THE SCREEN BACKGROUND COLOR
BLWP @VNTR          05 IS THE BACKGROUND COLOR. (LT BLUE)
* THIS SETS THE TOP AND BOTTOM OF THE SCREEN TO LT BLUE.
* SEE SECTION 16.1 E/A MANUAL FOR MORE INFORMATION ON VNTR.

* NOW SET CHAR >90 (128 decimal) TO A BLUE ON BLUE SQUARE
LI R0,>390           THIS IS THE POS IN VDP RAM COLOR TABLE FOR CHARS >80->87
LI R1,>5500          BLUE FOREGROUND/BACKGROUND IN MSB OF R1
BLWP @VSBW          REMEMBER R0 ALWAYS IS THE ADDR IN VDP. R1 ALWAYS CPU.
* SEE SECTION 21.2.2 FOR MORE INFORMATION ON THE COLOR TABLE

* NOW LET'S MAKE ALL THE CHARACTER SETS BLACK ON WHITE

LI R0,>383           START WITH CHAR SET >18
LI R1,>1F00          1=BLACK FG, F=WHITE BKGND
LOOP2 BLWP @VSBW     POINT TO NEXT VDP RAM COLOR TABLE ADDRESS
INC R0              LAST COLOR TABLE ADDRESS (CHARS >78->7F)
CI R0,>390
JNE LOOP2

* NOW WRITE THE BORDER TO THE SCREEN AND CLEAR THE SCREEN AT THE SAME TIME

LI R3,24            24 ROWS TO WRITE
CLR R0              BEGINNING OF SCREEN IMAGE TABLE
LI R1,BORDER        ADDRESS OF ONE ROW OF BORDER DATA
LI R2,32            32 BYTES TO WRITE
LOOP BLWP @VMBW     WRITE A ROW
AI R0,32            POINT TO BEGINNING OF NEXT ROW
DEC R3
JNE LOOP

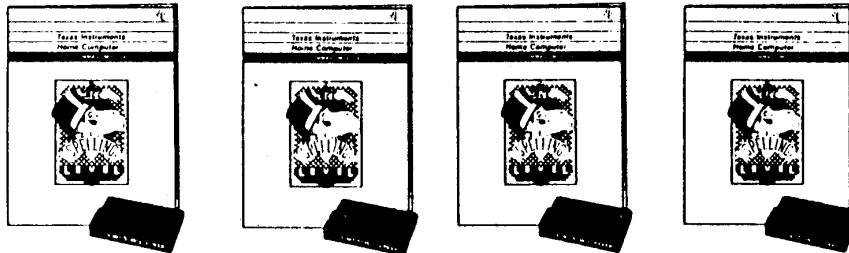
* NOW WE'LL PUT THE MESSAGE ON THE SCREEN CENTERED
* REMEMBER THAT THE SCREEN IMAGE TABLE IS FROM 0 TO 767 IN VDP RAM
* TO DETERMINE THE ADDRESS FROM ROW AND COLUMN WE USE THE FOLLOWING FORMULA
* ADDR=(ROW-1)*32+(COLUMN-1) IF WE WANT OUR MESSAGE AT ROW 12 COLUMN 9 THE VDP
* ADDRESS WOULD BE 360
```

(Please turn to Page 32)

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TUTORIAL, PART 2—

(Continued from Page 30)

Debugger released by Texas Instruments to user groups after it stopped producing the 99/4A. (An improved version of SBUG is available as Freeware from Edgar Dohmann—see the Freeware page in this issue. The original SBUG is available as Freeware from MICROpendium.—Ed.) SBUG allows you to operate from graphics or bit-map mode, single-step, and output to printer or disk. Let's get down to how to use it.

First, you should print out the instructions supplied with SBUG on the disk. Since this is a display/variable 80 file, you may print it out with TI-Writer or the Editor/Assembler editor. This help file covers all of the instructions available. I intend to cover only the ones of greatest interest to us.

It's important to know where your assembly program loads into memory. With few exceptions, which won't be discussed now, your program will load

```
LI R0,360      VDP ADDRESS IN SCREEN IMAGE TABLE
LI R1,MSG      ADDRESS OF THE DATA IN CPU RAM
LI R2,14       14 BYTES LONG
BLWP @VMBW     WRITE IT TO THE SCREEN
```

* NOW SUPPOSE WE WANT TO MAKE CHAR >7F A BALL SHAPE AND PLACE IT UNDER THE TEXT
 * THE PATTERN TABLE IN E/A IS LOCATED AT >0800. TO CALCULATE THE LOCATION OF A
 * PARTICULAR CHARACTER MULTIPLY IT'S HEX VALUE BY 8 AND ADD THE RESULT TO >800.

```
LI R0,>0BF8      (>7F*8)+>800=>BFB
LI R1,PATRN      PATTERN TO DEFINE >81 TO FROM CPU RAM
LI R2,8           PATTERNS ALWAYS 8 BYTES
BLWP @VMBW       >81 IS NOW THE SHAPE OF A BALL
```

```
LI R0,431        SCREEN IMAGE TABLE TWO ROWS BELOW TEXT CENTERED
LI R1,>7F00       WRITE >81 (BALL) TO THE SCREEN
BLWP @VSBW       PUT IT UP
```

* EXPERIMENT WITH THIS PROGRAM UNTIL YOU ARE COMFORTABLE WITH VDP RAM ACCESS

```
MOV @SAVRTN,R11  RESTORE R11 TO THE ADDRESS YOU WISH TO RETURN
LIMI 2           ENABLE INTERRUPTS SO QUIT KEY WILL WORK
JMP $            LOCK UP THE COMPUTER (SAME AS 100 GOTO 100)
RT
END
```

into high memory expansion at >A000. That's the first address in high memory. You can make your program load in other places but that is beyond the scope of this tutorial.

SBUG is what we call "relocatable object code." It loads on top of (not over) the last program entered. In other words, if your program is 500 bytes long it would load from >A000 to >A500. SBUG when loaded will load beginning at >A502.

I've included a brief program with this tutorial which puts characters on the screen. We'll use it to illustrate how to use SBUG. Go ahead at this time and type it in using the editor, save it, load the assembler except this time at the LIST FILE NAME prompt enter

your printer description. Remember, if you are using a PIO printer it should be entered with a period following PIO. At the OPTIONS prompt enter RLS: R to tell the assembler that you used R in front of your registers in the source code, L to give you a source listing to your printer, and S to give you a table of the symbols you used. This source list is necessary for using SBUG effectively.

Let's examine the source listing columns for a moment. Here's a sample line from the source listing:

```
0049 006C 0201 LI R1,>5500
006E5500
```

Here's what that tells us:

0049 means this statement is number 0049 in our source code. That means if we received the message "invalid register in line 0049" when we were assembling the code we could look at line 0049 and see what was wrong with R1.

The next field over is the most important one to us when using SBUG. This gives us the exact location in memory where this instruction resides. If this was the first program you loaded into memory then this instruction would reside at >A06C.

Remember, I told you that the program loads at >A000 by default. In other words, >A000 plus >006C =>A06C. We'll come back to this field shortly.

The next field, >0201, is the machine language mnemonic for Load Immediate (LI). Look on page 5 of

(Please turn to Page 34)

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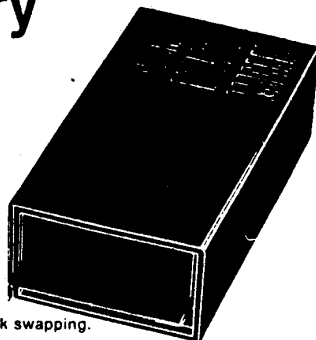
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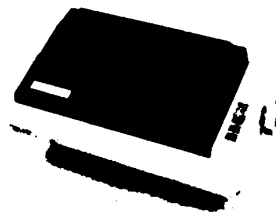
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TUTORIAL, PART 2—

(Continued from Page 32)

your blue Editor/Assembler card. See the opcode >0200? This tells us the instruction for this OPCODE is LI. The 1 in >0201 tells us to load immediate R1 with the value in the next word of memory. In this case Load Immediate R1 with >5500. See how easy that is? For a detailed description see section 15.4 in the E/A manual.

We're ready to get down to business. First load the object code for the program I have given you into the computer. You should ALWAYS load your program before you load SBUG. Next, before you press enter after you have loaded the demo program, load SBUG. One note here: as long as you are not using the Extended BASIC cartridge to load with, it is much faster to load the compressed version of SBUG, or SBUGC as it is listed on some disks. Both do the same job. Press enter and for the program name enter SBUG.

The SBUG title screen should come up. The message on the screen will ask you if you are using a bit map screen. Enter "N" at this prompt.


Next you will be asked for your list device. Enter your printer description here (you could enter DSK1.FILENAME instead if you want to output to disk). The input prompt is a period. At the prompt enter L to turn off the list device.

Our program runs from SBUG's control so we need to set up SBUG to run our program so we may interact with it. To do this we must tell SBUG where the first executable instruction (entry point) to our program is and what address we are using for a workspace. You may remember there are three hardware registers used by the 9900 CPU in the 99/4A: the program counter, workspace register and status register. The program counter always points to the next instruction to be ex-

ecuted in memory. The workspace register points to the current 32 bytes (16 words) of memory we are using for workspace. The status register contains the current status of the computer as a result of the last instruction executed. Given that, we now need to find the entry point to our program. There are two basic ways to do this. Perhaps the easiest is to look on the source listing at the label (in the sample program START) we placed in the DEF statement at the beginning of the program and get the address directly from the source listing.



The alternate way is to use the M command of SBUG to examine memory. The memory we need to examine is the Reference/Definition (REF/DEF) table approximately from >3F30 to >4000. This table lists the entry point to the program and the utilities we referenced. Here's how to

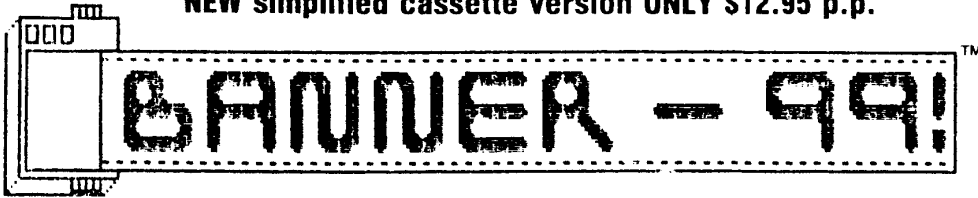
(Please turn to Page 36)



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TUTORIAL, PART 2—

(Continued from Page 34)

examine this table:

M 3F30,3FFF (enter)

This command will scroll the contents of these memory locations to the screen. In this case we are looking for the program name which is START. When you see START press any key to stop the scroll. You should see a line of memory which looks like this:

```
3F30 = 5354 4152 5420      START
3F36 = A058 ..... 
```

Press FCTN X to abort the listing or any command. Since labels may be up to six characters (bytes) long, the seventh and eighth bytes contain the program entry point, in this case >A058. This should be the same address on the source listing. (Remember, SBUG always displays and only accepts HEX numbers.)

Next we need the workspace address. We obtain that from the source listing. In this case it is >A05C. We get this by

finding the label for our workspace, in this case WS. We look at the second column and there is the beginning of the workspace.

We're now ready to set up the hardware registers to run our program. We do this by entering an R at the prompt. SBUG responds with W=0000. W is the workspace address. In this case type A05C and press the space bar. That calls up the prompt P=0000 for program counter address which, in this case, is A058. If you press space again you could set the status register but this is unnecessary in this case so just press enter. We've now told SBUG where our program resides in memory and where the workspace is.

To make it easy to figure the offset of our instructions we have a bias command. Press X and the computer displays 0000 press A000 (enter). This sets the value of X to >A000.

Now let's get down to examining our program in memory. To do this we set breakpoints (just like BASIC) at the instruction where we want to stop. Ready to set one?

At the prompt press B 68X (enter). This automatically adds the A000 offset to the instruction at 0068. You could have just entered it as B A068 if you wanted to add the offset yourself. This tells SBUG to interrupt the program before it executes LI R0, >390. See where I got that? Look at the second column on your source listing and go down it until you find memory location 0068. Now, if you want to see where your current breakpoints are, press B (enter). Now, to execute the program up to that instruction, press E (enter). Three addresses will be shown across the screen. From left to right they are the workspace address, program counter address and status

(Please turn to Page 38)

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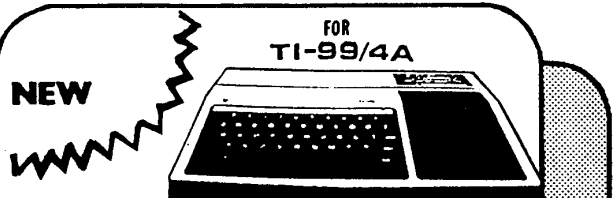
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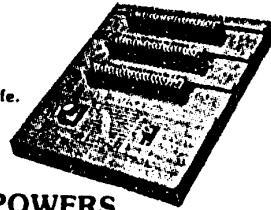
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TUTORIAL, PART 2—

(Continued from Page 36)

register. Now we're ready to single-step through some instructions.

Enter S for single-step at the prompt. This displays the following:

A068 = 0200 LI R00, >0390

A068 is the memory address for the instruction. Remember what 0200 is? LI R0. Then there is the plain text instruction. What value should be in R0?

>0390 of course. To check this press W 0 (enter). This shows the current contents of R0. If you ever have the need, you may change this value by entering another value before pressing enter. If you press the space bar you see the next register R1, and so on.

One important point: never try to single-step through VDP, GROM or KSCAN routines. There is a good chance you will lock up the computer. When you encounter one of these instructions just set a breakpoint (B) on

the other side of it and execute (E) around it. Now press B 80X or B A080 (enter) at the prompt. This sets the breakpoint at the INC R0 instruction. Press E (enter). What's the value in R0? It should be >383 from instruction A082. Now press S. The INC R0 instruction appears. Again check the value in R0 (remember W0); it should be >384. See how you may interact directly with the computer? Press S again and you see the CI instruction. Press S again and you get:

JNE \$+>00FA

JMP TO A07C

This says to jump to A07C (LOOP2) if R3 is not equal to zero. Now set B A0CE. Press E (enter) to execute. The program stops at the MOV @SAVR-TN,R11 instruction.

Let's examine some VDP RAM. To do this we use the M command again but precede the address with a V for

VDP access. Press M V168,1AF. This shows the screen image table from decimal 360 to 431 where we put our text and ball. Examine the bytes carefully and you should see the border characters. Note: the screen is not exactly as we had it because SBUG shares the same screen with us and we're seeing some of SBUG's screen also.

Now press M VBF8,C00 (enter). This is the pattern descriptor table where the shape of our ball is stored. Compare it with PATRN from the source listing and then press M A022,A028 to see the pattern description as it resides in CPU RAM.

Well I've gone long again but there is so much to cover. You really need to get the hang of using SBUG; it allows you to interact with your program to see exactly what is going wrong when you have a problem. It will save you many hours of grief.

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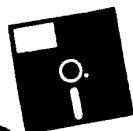
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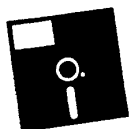
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Foundation Z80A Card

Turn a TI into Kaypro

By JOHN KOLOEN

Foundation Computing's Z80A card came out late in the spring, but it wasn't until it finally got its 80-column card to the market that one could say it had a fully configured CP/M-type system. Having received the 80-column card in late August, after placing an order in February, I can say without contradiction that these two cards will give your TI99/4A an entirely new personality, that of a Z80A-based computer, such as a Kaypro. It can't actually be called a CP/M system, since Foundation doesn't bundle it with the CP/M operating software. Rather, it comes with an operating system called MRS that works very much like CP/M and allows the user to run many CP/M compatible programs. (The MRS system was developed by Occo Inc., of Milford, Massachusetts.)

The 80-column card enhances the Z80A card by providing an 80-column by 25-row display using a monochrome monitor that uses an RCA-type plug. (The TI monitor cable can't be used.) The monitor cable plugs directly into the 80-column card, which is inserted into the TI Peripheral Expansion Box, while the Z80A card, which also resides in the PEB, is connected via cable to the 80-column card. (The cable uses standard 25-pin "D" series connectors. I recommend using flexible ribbon cable rather than stiff coaxial cable, particularly if there is little clearance between the back of the PEB and a wall. Also, both ends of the cable must be male.)

Before we get into the meat of the review, let it be noted that the 80-column card is accessed only through the Z80A card. Put aside any thoughts of an 80-column display using the TI99/4A system.

Performance: First, I am reviewing both the Z80A and 80-column cards together because the 80-column card has no purpose without the Z80A card.

Review

Report Card

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

Cost: \$259.95 (Z80A card); \$309.95 (80-column card) **Manufacturer:** Foundation Computing,

Requirements: Console, monochrome monitor and RCA-type cable, Peripheral Expansion Box, expansion memory, disk system, Extended BASIC

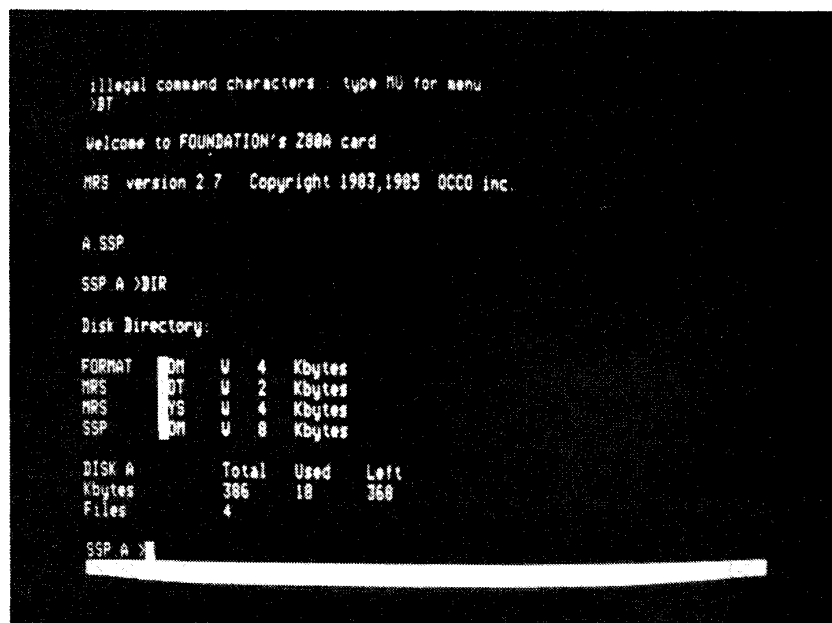
Also, because a lot of CP/M compatible software is designed for 80-column display, it seems appropriate to treat these two cards as parts of an integrated system.

The Z80A card includes a Western Digital disk controller capable of controlling up to four floppies, 64 kilobytes of dynamic RAM, eight

kilobytes of ROM firmware expandable to 16K, two RS232 ports, two parallel ports, and an eight-bit, four megahertz Z80A CPU chip. Used without the 80-column card, one serial port is plugged into an RS232 card in the PEB. The RS232 card is not necessary when used with the 80-column card. Both cards come in the familiar clamshell case.

Once the Z80A/80-column system is in place in the PEB, it changes the personality of the computer. As long as the 80-column card is in place and cabled to the Z80A card, it is not possible to access the TI99/4A operating system. I find this to be a bit annoying because I would prefer to be able to use the TI system without having to unplug the Z80A system cables. (The Morning Star Software CP/M card uses a menu at powerup to allow the user to select either the TI or the CP/M operating system. Of course, the Morning Star card does not have a companion 80-column card.) The Z80A card alone, however, does not take over un-

(Please turn to Page 41)



FOUNDATION COMPUTING Z80A CARD—

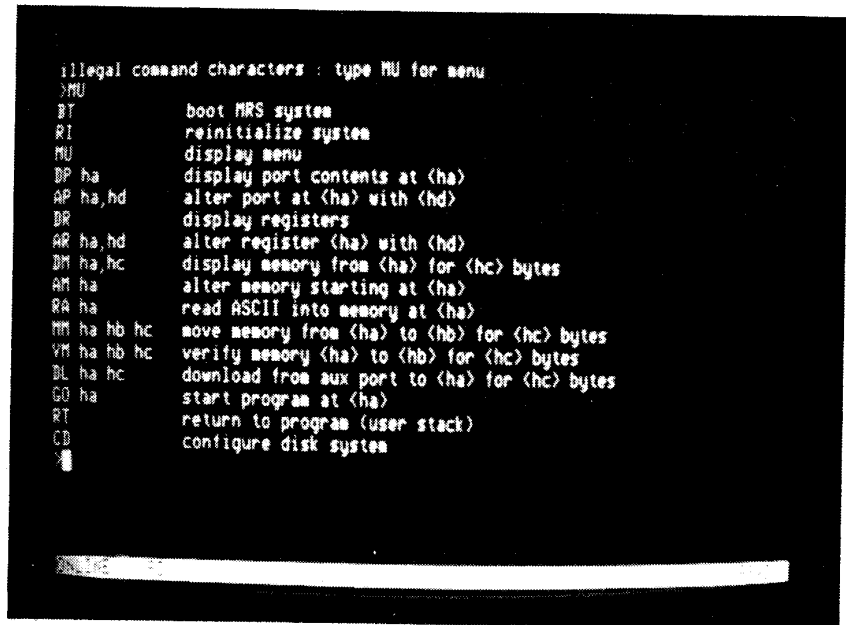
(Continued from Page 40)

til a terminal emulator program has been loaded using Extended BASIC or Editor/Assembler. I found that while the Z80A card is compatible with the Myarc Inc. memory expansion the 80-column card is not. The computer locked up when the 80-column card and Myarc card were both plugged in. I found no such problem using either the TI or Foundation memory expansion cards. Interestingly, as long as the PEB remains on, the Z80A/80-column system will continue to function, even when the TI99/4A console is turned off.

I ran this system with a number of programs, including Turbo Pascal, Word Star, Microsoft BASIC and a variety of public domain programs ranging from chess to hangman. Word Star worked fine, though even with an 80-column card I would not use it for word processing. The Pascal and BASIC programs worked flawlessly. Anyone familiar with any version of BASIC should find no trouble adjusting to Microsoft BASIC.

The Z80A system is Kaypro compatible, and should be able to run most Kaypro programs. Unfortunately, Kaypro is primarily a small business computer, so most programs available for it are designed for business, not hobbyist, applications.

The MRS system appears to be completely compatible with the CP/M operating system, and allows the user to configure the system for single- or double-density drives. Drives used with your TI99/4A are compatible with the Z80A disk system. (The disk controller is capable of using 40 or 80 track drives, though the TI disk system is limited to 40 track drives.) The only piece of hardware that may not work is your monitor or television, since the monitor must be monochrome and operate at a bandwidth of at least 12 megahertz. Color monitors are definitely out in the 80-column mode. Since the monitor plugs directly into the 80-column card using RCA type



jacks, the TI monitor cable is of no use. However, the Z80A card alone operates through the TI monitor cable, though it does not support color signals.

Control keys are more important in CP/M than in the TI system. Control keys are used for a variety of purposes, ranging from accessing peripheral devices to sending a signal to the Z80A every time a user replaces a disk in one of his drives. Unlike much TI software, which uses the upper row as much as possible for control keys, the Z80A system spreads control keys across the keyboard. Getting used to the locations of the keys is one of the first things the new Z80A user must do, particularly if such applications software as Word Star is used.

CP/M type operating systems are also quite dependent on the use of a reset switch. The reset switch on the Z80A card is located on the card and is difficult to reach. However, it is possible to rewire the switch, attaching it to a length of wire, and locating it at a convenient location for the user.

The MRS operating system is easy to pick up for anyone familiar with CP/M-type systems. Those who know

only the TI system can expect a period of trial and error learning. Unlike the TI operating system, which is ROM based, the MRS and CP/M systems are software based, meaning that they have to be loaded from disk.

The MRS system offers two types of commands: supervisor codes in the immediate (console) mode and user program command lines, called System Support Procedures (SSP). The former commands are limited and are used to set certain parameters within the MRS system and control system operation. The SSP is a collection of 22 utility programs. Each program is initiated through the use of a corresponding command. Here is a partial listing of commands and their functions:

BOOT—vector to machine PROM

TYPE—display file

PRINT—print file

ERA—erase file from directory

DIR—display disk directory

SAVE—save user memory

INIT—initialize disk operating system space

LOAD—load file into memory

PROTECT—write protect the disk or file

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FOUNDATION COMPUTING Z80A CARD—

(Continued from Page 41)

RELEASE—remove file write protection

PATCH—edit disk or file in hex

As you can see, some of the commands are analogous to commands used by the TI operating system.

The 80-column card is based on a National Semiconductor NS455 chip and uses terminal emulation firmware provided by National Semiconductor. The card is ADM3A Data Terminal compatible, provides a 5x7 character font, operates at with full duplex from 110 to 19.2K baud and includes a status line display on row 25. The card operates like a standard CRT terminal.

Here is a simple explanation of how the 80-column card works. It is taken from the card's documentation: "Using the 80 Column Card, a simple program running on the 99/4A can read the console keyboard and send ASCII characters to the 80CC interface. From there, characters are transmitted over an on-board RS232 line to an external computer (in this case, the Z80A card) and characters received back from the RS232 interface are displayed on the monitor."

Those familiar with terminal emulators used by the TI will have an advantage when using the 80-column card because of their familiarity with the escape and control sequences used in telecommunications.

Unlike operating a terminal emulator at even 1200 baud on the TI, the 80-column registers keyboard input virtually simultaneously with the press of the key. I noticed no lag time between the time I entered a character and the time it was displayed on the screen.

Ease of Use: Learning a new computer and operating system is like starting over in computing. While a background in another computer system helps (regardless of brand) there's a lot of new ground to be covered. Don't expect to master this system overnight. However, most books on CP/M systems should be relevant to the MRS system. The big-

gest hurdle to clear is getting used to the use of control keys, and learning the various escape and control sequences supported by the 80-column card.

I gave this system a grade of "B" on the report card because I had a difficult time initially in getting it to work. I didn't have any mechanical problems, mind you, but until I finally got the SSP utilities loaded, I was never sure that I was doing things properly. Invariably, I was receiving error messages that weren't easy to decipher and even when I phoned Foundation and had a technician go with me step-by-step through the process I still wasn't sure that I had everything under control. Part of the explanation for this is that the manual didn't include as much of a tutorial as I probably needed.

Documentation: There are actually two manuals: the one that comes with the Z80A card and the one that comes with the 80-column card.

The Z80A manual is more than 120 pages long and is filled with information. The bulk of it deals with the MRS system and appears to have been written by the MRS authors. The introduction and background material about the Z80A card itself appears to have been written by Foundation Computing. Both parts are quite well done, with the introduction being a cross between a tutorial and a guidebook. The introduction takes you step-by-step through the procedures for getting the system running, getting a disk formatted, preparing the system for the operating system, etc. It is written in a colloquial voice and exhibits a refreshingly wry sense of humor. (Many computer manuals seem to be written by stuffed shirts.)

While there is no way that a single manual can deal with everything involved in a computer system—just look at the number of manuals written for the TI—this one provides a good start for would-be Z80A users. It includes addresses of publishing houses

and others who offer support for CP/M systems.

The documentation that comes with the 80-column card is written in D/V 80 format to be read and outputted to a printer by TI-Writer. It is not very long, but provides as much information as I wanted about the card and how to make it work.

Compared to some of the manuals that TI produced, the documentation that comes with the Foundation system may not have deserved an "A" grade. But compared to manuals I'm familiar with designed for other computer systems, the "A" is well-earned.

Value: If you're looking for an 80-column, CP/M compatible computer that will work out of your TI system, then this is the one. While CP/M is no longer the most popular operating system on the market, it does support a variety of software, particularly for business applications, that is not otherwise available for the TI99/4A. CP/M is also useful from a programming and hobbyist standpoint, but definitely is limited when it comes to general home use. You won't find many first-rate games available in CP/M.

While the cost of the Foundation system is high—and that's the primary reason I gave it a "B—" for value on the report card—the cost of software may be even higher. For those with particular purposes in mind, I recommend pricing the type of software that would be used prior to deciding on going to CP/M. Obtaining software for the Z80A card is not simply a matter of walking into the corner computer store and pulling something off the shelf. Very few stores support CP/M, and those that do often are selling Kaypro computers. And they aren't likely to part with their software packages unless you buy their computers.

Conversely, if you keep your ear to the ground you should be able to get in touch with a number of CP/M user groups that will help you obtain the software you need. As with the TI,

(Please turn to Page 48)

9900BASIC

Not a compiler, but . . .

By RON ALBRIGHT

Why is it that programs written in the BASIC language on other machines run so much faster than the TI99/4A versions? For example, the incredibly popular Freeware terminal emulator program for the IBM, PC-TALK III, is written in BASIC. It runs extremely fast and supports 1200 baud data transmission. How can a program written in BASIC run so fast?

The answer is that it runs in a "compiled" object code form. After writing the program in BASIC format, the program is run through a compiler program which, for all intents and purposes, creates a "machine language" object code file which the computer can run much faster. With BASIC, the computer has to interpret each line before it executes it; in machine language, the computer needs no interpretation phase and can execute the program lines immediately. That is why programs written in BASIC—an easy language to learn but slow for the machine to execute—on other machines can still be fast.

Texas Instruments did not provide us with the software for a BASIC compiler. As usual, the third-party producers had to fill the gap. There have been a few attempts at providing compilers for our machine, but none have come to fruition. (SST Software markets a compiler called Expanded BASIC Compiler.—Ed.) The producers at CSI Design Group will probably disavow this review, since, clearly, in their documentation for 9900BASIC, they make the statement "The 9900BASIC package is not a compiler and is not to be sold or otherwise implied as such." Please don't sue me, guys, but it is the closest thing yet to one for our machine. Secondly, I'll never learn assembly language and, with this package, I actually got some code originally written in BASIC up and running out of Editor/Assembler. So, if it's not a compiler, it comes closer to fulfilling this function than

Review

Report Card

Performance B +
Ease of use B
Documentation A
Value A
Final Grade A -

Cost: \$24.95

Manufacturer: CSI Design Group, Box 50150, St. Louis, MO. 63105

Requirements: Console, monitor or television, memory expansion, Editor/Assembler, Disk System.

anything else.

Performance: I think we should look at the 9900BASIC package as being two things. Of the most interest to me (since I do not know anything at all about assembly language programming) is the Extended BASIC program supplied on the program disk called "Snapstart." There is a special section of the documentation about this innovative program.

CSI describes the program as "a tool that makes it easy to convert an existing TI BASIC or Extended BASIC program into code compatible with 9900BASIC." It is a first version of the program and it is limited in its abilities. First, as the documentation states, it will not handle "LET" statements, multi-statement lines (statements separated by double colons in Extended BASIC), or arithmetic calculations. I have not, as yet, been able to convert a single pre-existing program to 9900BASIC code using Snapstart, simply because of these major limitations. I hope the programmers at CSI Design continue to work on this particular part of their package as I think it is the one of most potential value to 99/4A owners.

Despite its limitations, I still find the

easiest way to get 9900BASIC code going is to first write the program in BASIC, noting the above limitations and working around them. Then, list the program to disk, thus creating a Display/Variable 80 file. Next, run the Snapstart program, which then converts the D/V80 program listing to D/V80 source code (9900BASIC compatible). Once the program has finished running you can load the source code created into the E/A Editor and see what has been produced.

I have found that not only are the above limitations evident—if the Snapstart program hits a line that does not conform to its restrictions or it does not support, it will tag these lines in the source code with an "***"; these are like REM statements in BASIC; the assembler utility of E/A will simply ignore these—but you also have to check the source code carefully for dropped variables. Snapstart has a nasty habit of leaving out variables needed for the 9900BASIC statements and you have to go in and add them to the source code before you assemble it, or else errors result. But Snapstart will generate a debug file for you which will tell you, if in cryptic terms, why Snapstart failed to interpret the program line. It helps. With the well-written manual that accompanies the program, and a little work (including studying the source code included with a nice demo program on the disk), you can usually solve the problems in your code.

Despite the obvious shortcomings with Snapstart, I still think it was easier to write through BASIC, convert with Snapstart, and (often) extensively debug than to just write straight source code.

If you know a bit about assembly language programming already, you can probably go straight to the Editor utility of E/A and, with the 9900BASIC manual, start writing code.

(Please turn to Page 45)

Adventure Editor

Play your own games

By JEFFREY SHAW

So, you've finished the Scott Adams adventures? Are you ready to move on to an even greater challenge? How about programming your own adventures using the adventure command module?

The Adventure Editor allows just that. With this package, one can write his or her own adventures and list, edit and copy existing Scott Adams adventures.

This package comes with two versions: one using the Mini-Memory module, the other, the Editor/Assembler. The E/A version was used for this review, though the features are identical for both versions.

Adventures are programmed using a unique language called "Adventure Programming Language." It is the programmer's job to handle the actual events of the game. The program and the adventure module do most of the "dirty work" (managing lists and pointers, etc.). Also, as any experienced adventurer can imagine, much of the work of creating a game involves text data entry. It is this which we will discuss first.

In creating a game, there are several lists which must be entered. There are, for example, lists for verbs and nouns corresponding to the first and second word of commands, respectively. There is also a list of "messages." These messages are those that are printed as a result of a command. There are lists for descriptions of locations, objects, the allowed exits from a location and many others.

These lists are all accessed by a two-character mnemonics and the number of the element in the list. For example, the tenth message would be accessed as M10.

In general, it makes no difference where in a list one places a certain element. Lists of nouns and verbs do not have to be in alphabetical order. However, there are some restrictions if

Review

Report Card

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

Cost: \$29.95

Manufacturer: Tex-Comp, P.O. Box 33084, Granada Hills, CA 91344, (818) 366-6631

Requirements: TI99/4A console; Mini-Memory version—cassette recorder; Editor/Assembler version—expansion memory, disk system

"automatic" actions are to take place. For example, if one wishes the module to automatically take care of "TAKE" actions (checking to make sure that the object is visible to the player, making sure that the player doesn't have too much to carry, etc.), the verb for "TAKE" must be the tenth element of the list.

Once the list is created, it is not possible to insert elements in it. It is only possible to add elements to the end of a list. This calls for considerable planning on the part of the adventure author!

Let's now move to the Adventure Programming Language (A.P.L.). It should be noted that prior programming experience is almost a prerequisite for using the Adventure Editor. If one does not know some basic programming concepts, it will be very difficult to master A.P.L.

A.P.L. code is organized into blocks which are numbered using a two-dimensional array. The first number in this array corresponds to the number of a verb in the verb list. The second number corresponds to a noun in the noun list. For example, the code to be

executed as a result of the command "JUMP CLIFF" would be placed in block (15,15) if "JUMP" is verb number 15 and "CLIFF" is noun number 15. If a noun number of zero is used, action can be initiated by a command consisting only of a verb, eg. "JUMP."

In those blocks with a verb number of zero, all actions which must take place independently of the player's input are programmed. An example of this would be the storm in "Savage Island I." In this block, one may include a probability factor. This is used to determine the percent chance of a given action occurring. Thus, if there is to be a five percent chance of the adventurer getting struck by lightning each round of play, five would be entered.

The A.P.L. commands are divided into two main classes. The *action commands*, which are always preceded by an exclamation mark, generally initiate some action immediately upon being encountered. The *conditional commands*, which are always preceded by a question mark, are used to check on some condition. Commands exist to perform all the tasks associated with adventure games; display messages, manipulate objects, etc.

One difficult feature of A.P.L. is the "IF" command. This statement works differently than BASIC when nested. It can be tricky until one gets the hang of it.

A.P.L. also allows the use of counters and flags. Counters can be used for such tasks as keeping track of the number of moves or for initiating some action after a certain number of moves. However, counters are generally difficult to use. There is one "current" counter and six "stored" counters. Only one counter may be acted on at one time. To operate on another counter, the value in the current counter must be exchanged with

(Please turn to Page 45)

9900 BASIC—

(Continued from Page 43)

The second part of the 9900BASIC package can be thought of as a set of subroutines that an assembly language programmer can use to make his coding more efficient. By using the "Copy" directive of E/A, the 9900BASIC routines are assembled right into your original source code and can make coding much more efficient. For example, the statement for creating a sprite and setting it into motion through Extended BASIC is simply:

```
CALL SPRITE(#1,42,7,50,45,0,10)
```

In 9900BASIC, it is equally simply:

```
BLWP @SPRITE
```

```
DATA 1,42,7,50,45,0,10
```

Using similar terminology, the package handles 38 other BASIC commands, including joystick routines, file handling, all sprite handling routines and sound. Further, 9900BASIC adds four scroll-screen routines for the four screen directions.

Once the source code has been created, through either Snapstart or your own code, it is time to assemble it. (You must also have as the first lines of your source code "LWPI > 20BA" and the second line as "BLWP @INIT".) You must have the "COPY DSK1.9900BASIC" as the last instruction of your source code. Snapstart will do this automatically for you. (I mention these minutiae since I have no idea of the significance, and assembly programmers might).

In the assembly process, you load the assembler option from the E/A disk and then, after responding with the name of your source code, off you go. It is a little weird to see your 20-line source code come out as 60-sector object code, but the copy command adds a big chunk to your program file.

If you are lucky enough to get through the assembly process with no errors, you are ready to run the object code. But, again, with 9900BASIC it is not a direct process. Using the E/A 3 option, you first load the object file "COMPRESSED," then your object file, then hit enter, and enter

"START" as the program name. You, friend, have just written an assembly language program.

Included with 9900BASIC is a utility to allow your object code to be run from Extended BASIC as well. A very useful feature.

Documentation: The documentation comes as 48 full-sized pages, easily readable and very complete. A full page is devoted to each command, with examples. The manual assumes that you have a rudimentary knowledge of how the Editor/Assembler module and disk work and how the Editor and Assembler utilities work. The most valuable piece of documentation I found was a listing of the source code for the demo program; that really helped.

Ease of Use: If you have never used the Editor/Assembler package, you will have a lot of reading and practice ahead. If you have a simple understanding of what source code is, what the

assembler does and how to use it, then you will have no trouble following the 9900BASIC documentation. That is all I had (have) and I got a program going in one afternoon.

Value: Compilers (I know, CSI, this isn't a compiler) for other machines sell, typically, for several hundred dollars. The price of this package as an introduction to the speed available to the assembly programmer for someone without the talent or desire to learn it otherwise, is a good one. I have gotten some silly sprites going in assembly language and the thrill of that has made the price well worth while. When I get to more complex programming, it will be a steal.

As a footnote, I hope CSI Design Group recognizes the quality of its initial work and pursues the development of the Snapstart program to have it reach its true potential. Its enhancement could be a real boon to the 99/4A programmer.

ADVENTURE EDITOR—

(Continued from Page 44)

the value of another, stored counter. This drawback was probably dictated by the structure of the adventure module.

Flags are much easier to use. There are 32 flags, which can be either true or false. Flags are used to check on conditions or to initialize some action. Flag number 16 is reserved for the module and indicates whether the player's light has run out. (There is a reserved counter which the programmer may initialize to indicate how many moves the player has until his light runs out).

The programmer may also create his own entry screen. This is the screen that appears before a game begins and is usually used to familiarize the player with the game.

Ease of use: The programming environment itself is generally easy to use. The editor program makes use of the text mode of the 99/4A. The screen is divided into three parts: the text

area, status line and echo line. The text area (upper 22 lines) is where list and code are actually entered. The status line shows the percent of memory used. The echo line is where commands are entered. These commands generally indicate what is to be typed in the text area; messages, list of objects, etc. Error messages are also displayed in the status line.

There are several pre-defined function keys. These perform such tasks as deleting characters, inserting characters, positioning the cursor, etc. These keys usually correspond to the "standard" TI function keys (eg. FCTN 1 is the delete character command). Unfortunately, there is no auto-repeat function.

It should also be noted that programs (code, lists, etc.) may be dumped to a printer. Be prepared to use a lot of printer paper, though! A

(Please turn to Page 55)

Newsbytes

Zyolog Castle contest

Wayne Burgess, "The KEEPER of the Castle of Zyolog VII," announces a graphics contest in Extended BASIC without sprites.

Entries must contain a castle somewhere in the background of foreground of the picture, Burgess says, because "my board takes on the fashion of a Mid-Evil Castle with the Main Menu set up as chamber rooms."

Burgess says the program can either be uploaded to the Castle at (815) 429-3533 or sent on a disk (which will be returned) to him at 135 West Grove, Sheldon IL 60966.

He says the winning program will be added to the Graphic Chamber and the author will receive a \$50 gift certificate to be used for programs or hardware from the BBS Computer Store which is also in a chamber in the Castle.

He says the system is set up on a Myarc 512K card, Disk Controller and RS232 card with a CorComp Triple Tech card. It has four DS/DD Teac drives which will become Quad density as soon as that feature is available, Burgess says.

He says the board is set up for X/Modem file transfers and will be set up for TE II soon, with general and freeware download sections. The Castle contains 13 message bases, a Game Room with three adventure games (he plans a graphic adventure soon, he says) and a Library.

Burgess notes that "there are different access levels that not all visitors will be able to obtain. Input to the program file and text file Chambers will gain each visitor higher access into the Castle."

Law software offered

An Alaska company announces legal software for producing legal documents, available for use on the TI-99/4A with either the Foundation Z80A card or Morning Star Software CP/M card.

According to officials of The Software Company, in all the programs a

series of questions come on the screen and the user types in the answers. The computer is thus "given an autopilot" to process documents and pleadings more efficiently and simply, they say.

In the Softwars® Series, a litigation series that produces various pleadings (e.g., Complaint, Answer) are PleadGen, Motions and Discovery, each for \$299.95. Bankruptcy Ch. 7 (business), Ch. 11 and Ch. 13 are available for \$299.95 each, while Ch. 7 (non-business) is available for \$199.95. Captions is priced at \$99.95 and Service at \$149.95.

Three programs are available in the FormAll® Series. They are CompForm, at \$299.95, which allows the user to prepare a corporation, according to the manufacturer, in fewer than eight minutes, with Articles, By-Laws, Minutes of First Meeting and Stock Certificate. CorpRecord, which sells for \$99.95, allows the user to prepare Minutes of Directors' and/or Stockholders' meetings, Corporate Resolutions, etc. Also available is GenForm for \$299.95.

OmniLex and OmniForm, in the OmniTask® series, process the documents and pleadings already being used in an office via an automatic system. They sell for \$199.95 apiece.

For further information, contact The Software Company, P.O. Box 872687, Wasilla, AK 99687 or (907) 745-6267.

Handbook published

The *Programmers' Handbook of Computer Printer Commands* has been published by Cardinal Point Incorporated.

The handbook, edited by Mary Lou East and Fred B. East presents code tables for models through 1984. The publishers say the book offers the escape and control programming codes necessary to activate more than 170 daisy wheel or dot matrix printers.

The book is divided alphabetically by manufacturer and subdivided by printer model. Codes are arranged by

written code (ESC 3), hexadecimal equivalent (1B,33) and decimal equivalent (27,51), with a brief description of the code function. A section lists names, addresses and phone numbers of all manufacturers listed in the book. There is also an index for daisy wheel printers and one for dot matrix printers.

The 270-page book lists programming information for some or all of the personal printers manufactured by the following companies:

Alphacom Inc., Amdek Corporation, Anadex Inc., Antex Data Systems, Apple Computer Inc., BMC (U.S.A.) Inc., Blue Chip Electronics, Brother International Corporation, C. Itoh Electronics Inc., Cal-ABCO, Cardco Inc., Centronics Data Computer Corporation and Copal (U.S.A.) Inc.

Also, Dataproducts Inc., Datasouth Computer Corporation, Digital Equipment Corporation, Diablo Systems Incorporated, Dynax Inc., Epson America Inc., Fujitsu America Inc. and Genicom Corporation.

Also, Hewlett Packard, Integral Data Systems Inc., Juki Industries of America, Mannesmann Tally Corporation, Micro Peripherals Inc., NEC Information Systems Inc., North Atlantic Industries Inc. Qantex Division, Okidata, Olympia (U.S.A.) Inc., Panasonic Industrial Company and Primages Inc.

Also, Printronix Inc., Qume Corporation, Radio Shack, Ricoh Corporation, Silver-Reed America Inc., Star Micronics Inc., Sumitronics Inc., Texas Instruments Incorporated, Toshiba America Inc. and Transtar by Vivitar.

The publishers say another volume is being prepared which will cover printers manufactured during 1985, including jet and color printers, which will update and add printer data for prior years if needed.

The book sells for \$37.95, with a 25 percent discount for orders of three or more books. (Indiana residents add 5 percent sales tax.) Shipping and handling

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Newsbytes

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ing is \$2 for one book with 80 cents charge added for each additional book.

For further information, or to order, contact Cardinal Point Incorporated, P.O. Box 596, Ellettsville, IN 47429 or phone (812) 876-7811 Monday through Friday 9 a.m.-5 p.m. EST.

Lotto Picker price cut

Ridge Services of New York City announces a price reduction to \$29.95 for its Lotto Picker program.

It also announces Release A1.1 for Lotto Picker and Pro Football Analyst.

These programs are now available for the Commodore 64/128. They were previously available only for the TI99/4A, IBM-PC and other MS-DOS machines.

Release A1.1 of Pro Football Analyst, which is sold unprotected for \$35, improves the screen information available to the user during the data input stage, according to the manufacturer.

Release A1.1 for Lotto Picker includes the new California lottery and changes to Canada and New York's games. The manufacturers say the program generates a series of random plays for all Lotto-type games, duplicating the same process used by lottery commissions. Daily numbers and Pick 4 selections can also be generated by Lotto Picker, according to Ridge Services.

For further information, contact Ridge Services, 170 Broadway, Suite 201, New York, NY 10038.

Chemtutor released

Chemtutor, a series of eight programs designed for use in a basic chemistry class (up to freshman college level), has been released by Datasystems of Oxnard, California.

In each program, according to George Holod of Datasystems, the user may specify the number and type of problems to be solved, and at the end of each session the average score will be displayed. Most of the programs

have a review section, and graphics are used where necessary.

Chemtutor is available for the TI99/4A (Extended BASIC) for \$70. It is available for the IBM PC (minimum configuration 256K, one disk drive, monochrome monitor) for \$100. Programs are also available separately for \$15 each.

For further information, contact Datasystems, 2301 Churchill Dr., Oxnard CA 93033.

Nor-Cal BBSes up

The Nor-Cal TI Users Group in Santa Rosa, California, has two bulletin board systems in operation.

BBS-99 #3 in Petaluma operates at 300/1200 baud from 2 p.m. to 9 a.m. PST. Phone number is (707) 762-6561.

BBS-99#4 in Santa Rosa operates 24 hours at 300 baud only. Phone number is (707) 539-8492.

Tigercub catalog

Tigercub Software has published a new catalog, #6, in which an additional 37 of the 140 programs are now offered in Extended BASIC versions. The catalog will be sent for \$1, which is deductible from the first order. A Volume 2 of the Tigercub Tips disk has also been released, a full disk of 64 programs, routines and files from the Tips newsletters #15 through #24. The price is \$15 postpaid, or Volumes 1 and 2 may be purchased for \$27.

For further information or to order, write Tigercub Software, 156 Collingwood Ave., Columbus OH 43213.

Navarone moves

Navarone Industries, formerly of Sonora, California, has moved.

New address for the firm is 11836 Judd Court, Suite 304B, Dallas, TX 75243. New phone number is (214) 437-1118.

Will Hadley, director of marketing for the firm, said the move was made in connection with a business merger.

Nebula game offer

Nebula Technologies has reduced the price of their CITADEL adventure game from \$17.95 to \$14.95 and includes a free METEORIDS arcade game with each purchase of CITADEL.

In CITADEL the player ventures into a three-level deep cavern seeking the quest item his king has sent him to find. Before each quest the user is allowed to visit the store and purchase weapons and armor. On the quest, the player will find traps, treasures, potions, scrolls, magical weapons and more than 50 different hungry monsters.

CITADEL has a save character feature that allows the user to save his surviving characters to diskette or cassette. As the character progresses, he/she will face tougher monsters and traps. The diskette version allows the saving of a game so the user can continue a game any time in the future. If a character completes enough adventures and reaches level 10, he/she is eligible to be placed in the CITADEL CHARACTER REGISTRY.

In METEORIDS the player is the pilot of a space ship whose mission is to clear away space of debris and alien saucers.

Both games require the TI99/4A and the Extended BASIC cartridge. They do not require memory expansion.

CITADEL and a free METEORIDS are available on cassette or diskette direct from Nebula Technologies for \$14.95. A free catalog can also be obtained from Nebula Technologies, P.O. Box 48915, Niles, IL 60648.

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

User Notes

ACCEPTable

The following tip on using the ACCEPT statement comes from the Atlanta (Georgia) 99 Computer User Group.

Those with Extended BASIC can input up to 255 characters using the ACCEPT statement. The command may be used in the programming or command modes. The only restriction is that the SIZE and AT options not be used. Of course, as a result of not using the AT option, the ACCEPT statement accepts data at the bottom of the screen and scrolls upward with each line as if using the INPUT command. An example of the use of ACCEPT is this:

```
1000 ACCEPT BEEP:X$
```

The Georgians suggests that the use of ACCEPT has greatest use in text processing applications.

Create-A-Cursor

Adam Dray, of the Penn Ohio 99/A Home Computer Users Group, has an interesting program that runs out of Extended BASIC that is used to change the shape of the cursor. It does this though the use of an drawing easel composed of eight rows by eight columns. The program is similar to a variety of simple character generators except that whatever you create will be

displayed in the shape of the cursor. Each dot in the 64-character matrix is turned on or off using the "S" or "D" keys, respectively. Pressing the enter key at the end of each row advances the cursor to the next row. After reaching the last dot, the program prompts you to edit the design or proceed. You may use any of the BASIC editing functions at any time while creating the cursor, including the left and right arrow keys, the delete, insert and erase keys.

When finished with the design, the program calculates the codes that in turn may be inserted in an Extended BASIC program (with memory expansion).

Next, the program displays a list of four options. They are: "D", changes the cursor to the pattern you've just created; "N", return to the cursor definition screen; "S", reset the standard cursor; "Q", quit the program.

Here is the program:

```
100 CALL CLEAR
110 CALL INIT
120 Q$=","
130 CALL CHARPAT(83,X$):: CALL CHAR(115,X$)
140 CALL CHARPAT(68,X$):: CALL CHAR(100,X$)
150 CALL CHAR(83,RPT$("F",16))
160 CALL CHAR(68,"O")
170 CALL CHAR(35,RPT$("55AA",4))
180 ! ***SET SCREEN
190 CALL SCREEN(5)
200 FOR A=0 TO 14
210 CALL COLOR(A,16,6)
220 NEXT A
230 DISPLAY AT(5,8):"CURSOR definition"
240 DISPLAY AT(10,9):"by Ada M dray"
250 DISPLAY AT(10,9):"#####"
260 FOR A=11 TO 18
270 DISPLAY AT(A,9):"#
280 NEXT A
290 DISPLAY AT(19,9):"#####"
300 DISPLAY AT(21,1):" s =
ON (S) / d = off (D)"
```

```
310 DISPLAY AT(23,1):" d$L,
INs, ERA, FCT s, FCT d"
320 ! ***INPUT BIN. CODES
330 FOR A=1 TO 8
340 ACCEPT AT(A+10,10)SIZE(-8)VALIDATE("SD"):V$(A)
350 NEXT A
360 DISPLAY AT(21,1):" dO YO
U WIsH TO EdIT? N"
370 DISPLAY AT(23,1):""
380 ACCEPT AT(221,25)SIZE(-1)VALIDATE("YN"):E$
390 IF E$="Y" THEN 300
400 DISPLAY AT(21,1):""
410 DISPLAY AT(21,6):"EWORKI
NG . . . ."
420 ! ***CONV'T TO BIN. O&1
430 FOR A=1 TO 8
440 IF V$(A)="" THEN V2$(A)=
RPT$("O",8):: GOTO 500
450 FOR B=1 TO 8
460 Z$=SEG$(V$(A),B,1)
470 IF Z$="S" THEN Z$="1" EL
SE Z$="0"
480 V2$(A)=V2$(A)&Z$
490 NEXT B
500 NEXT A
510 ! ***CONV'T BIN. TO DEC.
520 DISPLAY AT(21,1):""
530 DISPLAY AT(21,1):"CODEs:
";
540 FOR A=1 TO 8
550 FOR B=1 TO 8
560 EXPON=8-B
570 Z$=SEG$(V2$(A),B,1)
580 Z=VAL(Z$)*2^EXPON
590 V(A)=V(A)+Z
600 NEXT B
610 IF A=8 THEN Q$=""
620 PRINT STR$(V(A))&Q$;
630 NEXT A
640 ! ***PRINT DEC. CODES
650 FOR A=T TO 20 :: DISPLAY
AT(A,1):"" :: NEXT A
660 ! ***SET MENU
670 CALL CHARSET
680 FOR A=0 TO 14 :: CALL CO
LOR(A,16,6):: NEXT A
690 DISPLAY AT(8,1):"d DEFI
NE CURSOR"
700 DISPLAY AT(10,1):"N CRE
ATE NEW CURSOR"
710 DISPLAY AT(12,1):"Q QUI
T"
```

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Z80A CARD—

(Continued from Page 42)

most of your purchases will probably be made via mail-order.

Having spent nearly \$600 on the Foundation system, am I happy with it? Yes and no. Yes, it does exactly what I was told it would do. And I am happy about that. But no, I'm not obsessed with the Z80A system and have developed little inclination to really get into CP/M. The Foundation system is a great product, but I'm not sure what I'm going to do with it.

Now, if only the 80-column card would work with my TI99/4A....

User Notes

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```

720 DISPLAY AT(14,1):"S STA
NDARD CURSOR"
730 DISPLAY AT(18,3):"YOUR C
HOICE? d"
740 ACCEPT AT(18,19)SIZE(-1)
VALIDATE("DNQS"):C$
750 IF C$="N" THEN GOSUB 890
:: GOTO 100
760 IF C$="S" THEN FLAG=1 ::
GOTO 790
770 IF C$="Q" THEN CALL CLEA
R :: END
780 ! ***DEFINE CURSOR
790 CALL LOAD(8196,63,248)
800 CALL LOAD(16376,67,85,82
,83,79,82,48,8)
810 IF FLAG=1 THEN GOTO 960
820 FOR ADD=12288 TO 12295
830 CALL LOAD(ADD,V(ADD-1228
7))
840 NEXT ADD
850 CALL LOAD(12296,2,0,3,24
0,2,1,48,0,2,2,0,8,4,32,32,3
6,4,91)
860 CALL LINK("CURSOR")
870 GOTO 660
880 ! ###RE-INIT. ROUTINE
890 FOR A=1 TO 8
900 V$(A),V2$(A)=" "
910 V(A)=0
920 NEXT A
930 Q$=","
940 FLAG=0
950 RETURN
960 ! ###STAND. CURSOR
970 CALL LOAD(12288,0,124,12
4,124,124,124,124,124)
980 GOTO 850

```

Joystick loader

Herb Burgett, of the Manasota Users Group of Manasota, Florida, has created a loader program that uses a joystick to select programs for loading. It requires a disk system to work. The program can be adapted to display a selection of several programs for loading by changing the program names starting at line 1030 and by changing the names of the programs in the RUN command starting at line 1160. Here is the program:

```

100 ! *****JOYSTICK REMOT
E CONTROL*****
105 ! ***BY HERB BURGETT***
110 GOSUB 5000
130 DISPLAY AT(9,8):"USER FR
IENDLY ": " JOYSTICK REMOTE
CONTROL": " TOUCH THE FIR
E BUTTON": " TO DISPLAY THE
NEXT SCREEN"
140 CALL KEY(1,K,S):: KE=S :
: CALL KEY(2,K,S):: KE=KE+S
:: IF KE<1 THEN 140
145 GOSUB 5000
150 DISPLAY AT(5,2):"PROGRAM
MENUS WILL PERMIT": " JOYS
TICK CURSOR ALIGNMENT": "FO
R REMOTE PROGRAM SELECTION"
160 DISPLAY AT(16,3):" RELEA
SE THE ALPHA LOCK": " AND PRE
SS FIRE TO PROCEED"
200 CALL KEY(1,K,S):: KE=S :
: CALL KEY(2,K,S):: KE=KE+S
:: IF KE<1 THEN 200
210 GOSUB 5000
1000 REM THIS PROGRAM ALLOWS
YOU TO USE THE JOYSTICKS TO
TRANSFER PROGRAM COMMAND
1020 DISPLAY AT(2,5):"ALIGN
CURSOR FOR SELECTION"
1030 DISPLAY AT(6,2):"-----
";"PROGRAM(+)"
1040 DISPLAY AT(11,2):"-----
-";"PROGRAM(-)"
1050 DISPLAY AT(16,2):"-----
-";"PROGRAM(X)"
1060 DISPLAY AT(21,2):"-----
-";"PROGRAM(-;-)"
1070 CALL CHAR(128,"00FF0F0
E0F0E0F")
1080 CALL SPRITE(#1,128,2,28
,40)
1090 CALL JOYST(1,X1,Y1):: C
ALL JOYST(2,X2,Y2)
1100 CALL MOTION(#1,-6*(Y1+Y
2),0)
1110 CALL KEY(1,K,S):: IF K=
18 THEN CALL POSITION(#1,X,Y
)ELSE CALL KEY(2,K,S):: IF K
=18 THEN CALL POSITION(#1,X,
Y)ELSE 1090
1120 IF X<50 THEN 1160
1130 IF X>50 AND X<100 THEN
1170
1140 IF X>50 AND X<150 THEN
1180

```

```

1150 IF X>150 THEN 1190
1160 RUN "DSK1.INDEX"
1170 RUN "DSK1.28COLCONV"
1180 PRINT "LINE 700" :: PRI
NT "X=";X :: GOTO 1090
1190 PRINT "LINE 800" :: PRI
NT "X=";X :: GOTO 1090
5000 CALL CLEAR :: CALL SCRE
EN(12):: CALL COLOR(13,5,16)
:: CALL HCHAR(24,1,129,64)::
CALL VCHAR(1,32,129,48):: R
ETURN

```

Insanity

The following program may drive you crazy, but you'll probably give up for endangering your sanity. It requires Extended BASIC and a joystick. It has appeared in a number of newsletters, including the Southern California Computer Group newsletter, The Computer Voice.

The object is very simple: try to vertically align four colored blocks. Sounds simple, doesn't it? It ain't.

Here's the program:

```

1 REM *****
2 REM *INSANITY BY G. MINEO*
3 REM *
4 REM *WESTMEGO, LA
5 REM *
6 REM *
7 REM *****
8 CALL CLEAR
9 DISPLAY AT(12,1):"INSANITY
"
10 DISPLAY AT(15,1):"LIKE TH
E NAME SAYS, USE YOUR"
11 DISPLAY AT(17,1):"JOY STO
CKS TO PUT 'EM LIKE"
12 DISPLAY AT(19,1):"YOU FOU
ND 'EM. GOOD LUCK!"
13 DISPLAY AT(23,1):" PRESS
ANY KEY TO BEGIN"
14 CALL KEY(0,K,S):: IF S=0
THEN 13
15 CALL CHAR(42,"FFFFFFFFF
FFFF")
16 CALL MAGNIFY(2)
17 CALL CLEAR
18 DISPLAY AT(1,12):"INSANIT
Y"
19 CALL SPRITE(#1,42,5,96,12

```

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User Notes

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```

8)
20 CALL SPRITE(#2,42,9,112,1
28)
21 CALL SPRITE(#3,42,11,80,1
28)
22 CALL SPRITE(#4,42,16,128,
128)
23 CALL JOYST(1,Y,X)
24 CALL MOTION(#2,-20*X,20*Y
)
25 CALL MOTION(#1,-20*X,20*Y
)
26 CALL MOTION(#3,-20*X,20*Y
)
27 CALL MOTION(#4,-20*X,20*Y
)
28 GOTO 23
29 REM IT CAN BE DONE!
30 REM REPRINTED FROM SAN FR
ANCISCO 99ERS NEWSLETTER

```

Screen colors

The following program allows users to change screen and border colors by inputting the respective color codes. It was done by Larry Bantley with modifications by John Behnke. It appeared in the Chicago Times, the newsletter of the Chicago Users Group. It requires Extended BASIC and a memory expansion. The colors selected will last until the computer is returned to the title screen or the program is run again.

Here is the program:

```

100 !+++++!
110 ! "XB SCREEN COLOR" !
120 !By Larry Bantley with!
130 !modifications by John!
140 !Behnke Will change !
150 !your screen display !
160 !to your choice while !
170 !in command mode. !
180 !Requires 32K Memory !
190 !+++++!
200 CALL CLEAR
210 INPUT "Border Color (1-1
6)? ":A
220 INPUT "Screen Color (1
-16)? ":B
230 CALL CLEAR
240 C=(B-1)+(A-1)
250 CALL INIT :: CALL LOAD(9

```

```

984,C,C,C,C,C,C,C,C,2,0,7,15
+A,4,32,32)
260 CALL LOAD(9999,48,2,0,8,
0,2,1,39,0,2,2,0,8,4,32,32,3
6,2,0,8,8,4)
270 CALL LOAD(10021,32,32,36
,2,0,8,16,4,32,32,36,2,0,8,2
4,4,32,32,36,4,91)
280 CALL LOAD(-31804,39,8)::
CALL LOAD(-31952,255,231,25
5,231)

```

40-column display

The following article and programs appeared in the Call Newsletter produced by the Atlanta 99/4A Computer Users Group. It was written by Roy T. Tamashiro, Ed.D.

I have often wanted to use a 40-column screen in a BASIC program because you can put 43 percent more text on it than on the normal 28-column screen in BASIC. However, the 40-column screen is not available in TI-BASIC or Extended BASIC, even though a 40-column screen is present in the TI99/4A ROM. The program below makes it possible to create and implement programs in Extended BASIC on a 40-column screen. A memory expansion and cassette or disk system are required.

To access the 40-column screen, type in and save the program "Forty-column Text Screen for X-BASIC". Then compose a program for the 40-column screen—examine the sample program (below) for ideas.

To turn on the 40-column screen in your program, use the instruction CALL LINK("FORTY").

You may continue to use most of the Extended BASIC instructions, with the following substitutions:

```

CALL CLEAR—CALL LINK("CLS'
')
INPUT, LINPUT or ACCEPT AT—
CALL LINK("INPUT",ROW&(1-24)
,COLUMN&(1-40),String Variable
PRINT or DISPLAY AT—CALL LIN
K("DISPL",ROW&(1-24),COLUMN
&(1-40),String Variable
CALL COLOR, CALL SCREEN—C

```

ALL COLORS(Foreground,Background)

If you wish to change the colors of the characters on the screen, add lines 16000-16020 in the sample program as the last routine in your program. This makes it possible to use the above CALL COLORS instruction. Use the BASIC color codes (1-16) to designate foreground and background colors.)

Do not use SPRITE instructions (CALL SPRITE, CALL MAGNIFY, CALL COINC, etc.) on the 40-column screen. Other instructions such as CALL HCHAR and GCHAR work. However, since they are oriented toward a 32-column screen, their locations on a 40-column screen may be confusing.

To return to the 32-column screen in Extended BASIC, enter CALL LINK("BSCRN"). Be sure to use this instruction when exiting the 40-column program, otherwise the program may not be visible on the screen. (See line 200 in the sample program.)

Note that the new INPUT and DISPLAY instructions use string variables only. Numeric variables must be converted before or after these CALLs. For example, to DISPLAY a numeric variable, use the following model:

```

210 N=1 :: N$=STR$(N) :: CALL
LINK("DISPL",24,1,N$)

```

In this example, the value in N, which is 1, is converted to the string variable N\$ and displayed at row 24, column 1.)

Or, to INPUT a numeric variable, try this:

```

230 CALL LINK("INPUT",24,1,N$)
:: N=VAL(N$)

```

In this example, a number is accepted at row 24, column 1 and assigned to N.

To RUN your program, first load and RUN the Forty-Column Text Screen for X-BASIC, then load and RUN your program. As long as you do not use CALL INIT or load another assembly language program you may run your program without reRUNning the 40-column text program.

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User Notes

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```

100 ! *****
110 ! * FORTY-COLUMN TEXT *
120 ! * SCREEN FOR XBASIC *
130 ! *****
140 ! AUTHOR: ROY T. TAMASHI
    RD, ED.D.
150 ! DECEMBER 1984, XBASIC,
    W/MEMORY EXPANSION
160 REM
170 CALL INIT
180 CALL LOAD(8196,63,216)::
    CALL LOAD(16344,66,83,67,82
,78,32,50,108,68,73,83,80,76
,32,48,190)
190 CALL LOAD(16360,73,78,80
,85,84,32,49,36,67,76,83,32,
32,32,48,78,70,79,82,84,89,3
2,48,38)
200 CALL LOAD(12288,8,31,16,
0,50,190,0,0,0,0,1,108,51,18
8,0,0,0,0,0,2,12,50,116)
210 CALL LOAD(12312,215,32,4
7,190,215,32,47,191,13,0,1,1
08,2,107,2,224,131,224,2,1,2
40,129,216,1)
220 CALL LOAD(12336,131,212,
216,1,140,2,6,193,216,1,140,
2,2,1,245,135,216,1,140,2,6,
193,216,1)
230 CALL LOAD(12360,140,2,4,
96,48,86,2,224,48,0,6,160,48
,98,4,224,131,124,2,224,131,
224,4,96)
240 CALL LOAD(12384,0,112,4,
192,2,1,128,0,4,32,32,32,5,1
28,2,128,3,192,22,250,4,91,2
,1)
250 CALL LOAD(12408,0,1,4,19
2,4,32,32,12,200,32,131,74,4
8,36,192,224,48,36,2,67,0,25
5,2,2)
260 CALL LOAD(12432,255,216,
2,34,0,40,6,3,22,252,200,2,4
8,34,2,1,0,2,4,192,4,32,32,1
2)
270 CALL LOAD(12456,200,32,1
31,74,48,36,192,96,48,36,2,6
5,0,255,6,1,168,1,48,34,4,91
,2,224)
280 CALL LOAD(12480,48,0,6,1
60,48,118,2,1,255,0,216,1,50
,189,2,1,0,3,4,192,2,2,50,18
9)
290 CALL LOAD(12504,4,32,32,
20,4,197,209,96,50,189,6,197
,2,6,50,190,192,32,48,34,6,1
60,49,28)
300 CALL LOAD(12528,4,193,19
2,86,2,33,96,0,4,32,32,32,5,
128,6,160,49,28,6,5,19,9,6,1
93)
310 CALL LOAD(12552,2,33,96,
0,4,32,32,32,5,198,5,128,6,5
,22,236,4,96,48,86,2,128,3,1
92)
320 CALL LOAD(12576,21,251,4
,91,2,224,48,0,2,2,1,0,2,1,3
2,0,216,129,50,190,6,2,22,25
2)
330 CALL LOAD(12600,6,160,48
,118,2,1,0,255,192,32,48,34,
160,64,2,129,3,192,18,2,2,1,
3,192)
340 CALL LOAD(12624,200,1,48
,36,4,196,193,64,2,1,32,0,21
7,1,50,191,2,1,126,0,4,32,32
,32)
350 CALL LOAD(12648,2,1,5,0,
216,1,131,116,6,160,50,34,21
6,32,131,117,48,32,4,193,208
,96,131,117)
360 CALL LOAD(12672,192,5,2,
129,13,0,22,18,2,1,128,0,4,3
2,32,32,4,224,131,124,4,192,
2,1)
370 CALL LOAD(12696,0,3,6,19
6,216,4,50,190,2,2,50,190,4,
32,32,16,4,96,48,86,2,129,7,
0)
380 CALL LOAD(12720,22,13,2,
1,32,0,217,1,50,191,2,33,96,
0,4,32,32,32,6,0,6,4,22,245)
390 CALL LOAD(12744,4,96,49,
36,2,129,8,0,22,17,2,1,32,0,
217,1,50,191,2,33,96,0,4,32)
400 CALL LOAD(12768,32,32,6,
0,6,4,128,32,48,34,18,181,5,
132,5,128,4,96,49,86,2,129,9
,0)
410 CALL LOAD(12792,22,2,2,1
,32,0,2,129,32,0,17,169,217,
1,50,191,2,33,96,0,4,32,32,3
2)
420 CALL LOAD(12816,5,132,5,
128,136,0,48,36,18,158,6,0,6
,4,4,96,49,86,4,193,2,0,32,0
)
430 CALL LOAD(12840,2,2,255,
0,4,32,32,28,144,32,131,124,
19,26,144,160,131,117,19,243
,2,3,0,5)
440 CALL LOAD(12864,6,3,2,1,
9,192,6,1,22,254,4,32,32,28,
144,32,131,124,19,11,144,160
,131,117)
450 CALL LOAD(12888,19,228,4
,32,32,28,192,195,22,239,152
,32,48,32,131,117,22,220,4,9
1,2,224,48,0)
460 CALL LOAD(12912,6,160,48
,98,2,0,3,0,4,193,4,32,32,32
,5,128,2,128,3,192,22,250,2,
0)
470 CALL LOAD(12936,224,1,21
6,0,131,212,6,192,4,32,32,48
,2,0,3,32,4,32,32,48,2,0,7,2
3)
480 CALL LOAD(12960,4,32,32,
48,2,0,8,0,2,1,16,0,4,32,32,
32,5,128,2,128,8,31,22,250)
490 CALL LOAD(12984,4,96,48,
86,0,255,0,32,32)
100 REM *SAMPLE PROGRAM*
110 CALL LINK("FORTY")
120 CALL LINK("CLS"):: CALL
LINK("DISPL",1,15,"HELLO THE
RE")
130 CALL LINK("DISPL",10,1,"
FOREGROUND COLOR--ENTER 1-16
:")
140 CALL LINK("INPUT",10,35,
F$):: F=VAL(F$)
150 CALL LINK("DISPL",12,1,"
BACKGROUND COLOR--ENTER 1-16
:")
160 CALL LINK("INPUT",12,35,
B$):: B=VAL(B$)
170 CALL COLORS(F,B)
180 CALL LINK("DISPL",23,1,"
ENTER (1) TO GO ON; OR (2) T
O EXIT:")
190 CALL LINK("INPUT",23,38,
K$):: IF K$="1" THEN 120
200 CALL LINK("BSCRN"):: END
16000 SUB COLORS(F,B)
16010 CALL LOAD(12350,16*(F-
1)+(B-1)):: CALL LINK("FORTY
")
16020 SUBEND

```

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

Freeware (or nearly so)

Freeware policies

This page is a regular feature of MICROpendium that is published every other month. MICROpendium makes no claims as to the validity of any Freeware offer, nor is there any guarantee that any software will be suitable for any purpose.

FREWARE REQUIREMENTS

- disks sent for freeware must be initialized;
- unless otherwise stated, you must include a stamped, self-addressed return mailer to receive the Freeware;
- be patient, those offering Freeware are not doing it for a profit;
- report any problems you have to MICROpendium.

Software updates

MICROpendium is offering file updates for TI-Writer and Microsoft Multiplan. Also offered at no charge is Super Bugger and an Extended BASIC loader for TI-Forth.

The TI-Writer enhancements offer new printer defaults and true lowercase letters. Multiplan enhancements include an auto-repeating cursor that speeds up program operation. The Forth loader allows TI-Forth to be used with Extended BASIC rather than the Editor/Assembler. Super Bugger is an improved version of TI-Debugger.

TI-Writer and Multiplan updates all fit on a single-sided disk. Super Bugger will fit on a single-sided disk. All three will fit on a double-sided diskette. The Forth loader requires a single-sided diskette. Order the Forth loader separately from the updates and SBUG. Send the appropriate number of diskettes to Freeware, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

TI-Forth is also available. The cost is \$20 and includes the 232-page manual, the system disk with screens, a demo disk, postage and packaging. Purchasers are asked to include two initialized single-sided diskettes. MICROpendium will supply a third disk containing the source code for TI-Forth at no extra charge.

To order, send check or money order and two diskettes to Forth, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

Free access library

Amnion Helpline is offering TI users its Free Access Library of public domain software. The library consists of 104 diskettes filled with programs for the TI99/4A.

The library is operated as a non-profit entity by Dr. Guy-Stefan Romano, director of Amnion Helpline. The helpline is a free information service for TI users who have questions about products and other aspects of home computing.

The library provides "volumes" of programs. There are 37 diskettes, or volumes, of games; 10 diskettes of graphics-oriented programs; 16 music-oriented diskettes; 14 diskettes of learning materials in many categories; eight diskettes of financial and business programs; seven diskettes of technical, scientific and statistical programs; six diskettes of personal and home use programs; and 6.5 diskettes with miscellaneous programs ranging from baseball statistics to programming utilities. There are also a limited number of Pascal and Forth programs available.

Volumes are \$5 each. The cost includes the single-sided diskette, mailer and postage. Users may send their own diskettes and return postage and mailer and obtain volumes for \$2.50 each. Romano asks that users send no money until writing for information, as there are programs for which no copying fee is charged.

Volumes on double-sided diskettes are \$8, \$4 if the purchaser sends a diskette, mailer and postage.

All programs may be copied and redistributed freely as long as no charge is made for them.

The library also will supply particular programs to fit specific purposes to any user who sends an initialized diskette with return mailer and postage. Enclose a note describing the type of program desired. Amnion will return the diskette with programs that fit the description.

Users are encouraged to donate programs to the library. There is no payment. Include a note stating that the program submitted is to be placed in the public domain.

Order forms for software volumes are available from the library. For more information, contact Amnion Helpline at (415) 753-5581 from 9 a.m. to 4 p.m. (Pacific time) or write to 116 Carl St., San Francisco, CA 94117.

Weather forecaster

Gary Cox offers two programs. The first is called "Weather Forecaster," and Cox says it will forecast the weather for any place in the U.S. "with what I think of as a fair degree of accuracy." The second is a game called "Lawnmower" in which the user tries to mow the yard while his irritable neighbor tries to kill him and a dog tries to bite him. "Weather Forecaster" requires Extended BASIC, 32K and a disk system. "Lawnmower" requires Extended BASIC; speech synthesizer is optional. Cox says he asks \$5 for the two programs "if the users think they are worth it. However, regardless of whether or not I receive any money I encourage people to copy and distribute my programs."

Those interested may send an initialized disk, mailer and return postage to Gary Cox, 3174 Melbourne, Memphis, TN 38127.

Free Utilities

Danny Michael, of Route 9, Box 460, Florence, AL 35630, has a freeware screen dump and a program called Neatlist.

The screen dump, now in version 3, is written in assembly language and is unprotected. It requires XBASIC or will work out of console BASIC using E/A or MMM. It works with Epson/Gemini-type printers. The program includes instructions and fully commented source code. It will print the screen in a choice of 6 modes.

Neatlist is an assembly language utility for XBASIC programmers. Neatlist produces an orderly listing of programs that can be a time-saver in debugging and modifying programs. The program allows the user to set margins for program listings as well as starting and ending line numbers. Listings include easy to read program lines and a list of variables used in the main and subprograms. If you like it, he says, you may pay him for the program, but not more than \$10. If you don't like it, "you keep it anyway," he says. He asks that you give copies of the program to others. Send one disk for each program. Or send \$5 for each program and he will supply the disk, mailer and postage.

Two music disks

Bill Knecht of the Houston Users Group is offering two disks of music programs. All songs include graphics, some animated.

The first disk includes a musical load program and a collection of popular and folk tunes, including the U.S. and Canadian national anthems.

The second disk includes a unique load program and a collection of hymns, including a Christmas medley.

The programs are written in XBASIC and require memory expansion and two disks. For a copy of these, you may send two 5SSD disks and a prepaid mailer, OR a check for \$6 for both, to Bill Knecht, 815 Yorkshire, Pasadena, TX 77503.

Two programs

Two disks of public domain software are available from David R. Romer, 213 Earl St., Walbridge, OH 43465. Send \$6 per disk to cover costs of the disk, postage and handling.

Homebrew Module Software includes four stand-alone programs as well as a loader system to provide title screen menu access to "Load and Run" E/A programs. The programs—Single Sector Copy, Debug, Disassembler and TK-Writer loader—are loaded into the 8K module RAM and are accessed from the title screen menu. They need not be reloaded because the module is battery backed. Source programs and documentation are included.

TI-SORT is a machine language utility that loads under the TI-Writer and TK-Writer utility option or Option 5 of E/A. Data files created with the TI-Writer or E/A editor can be sorted rapidly in RAM with this utility. The program uses standard TI menu format and sorts DIS/VAR 80 files. Files of up to 300 records may be sorted, using either the quicksort or shellsort algorithm and saved to disk. Files may also be printed. Single or bi-level ascending sorts are supported. Documentation and a demonstration file are included.

Free craps game

Ramsot Enterprises, 1501 E. Chapman Ave., Suite 338, Fullerton, CA 92631, is offering its Computer Craps game as Freeware. The game formerly sold for \$14.95. The game requires XBASIC and expansion memory. Instructions are included as a file that can be read by TI-Writer.

On cassette

Robert D. Temple, 602 E. Franklin St., Kanton, OH 43326-2015, is offering several small programs in console BASIC. The programs are used in state lottery games to pick either 3, 4 or 6 numbers completely at random using the RANDOMIZE and RND command. Another program picks every possible combination of numbers in Lotto-type games. Send a cassette for the programs.

Free routines

Silver Wolf Software, P.O. Box 4242, Santa Rosa, CA 95402, is offering a collection of assembly language routines written for the NORCAL TI99/4A User Group. The utilities include a routine to save and recall an entire screen of text, a routine that creates lowercase letters with true descenders and a complete chart of ASCII characters, alongside their code values. The routines require XBASIC, disk system and memory expansion. Send a disk with return mailer and postage.

XBASIC disk cataloger

Loads from XBASIC and includes on-disk documentation. Send diskette, return mailer and postage to Ron Ruledge, 1020 Third St., Waukegan, IA 50263.

(Please turn to Page 53)

Freeware (or nearly so)

(Continued from Page 52)

Forth configuration

This configuration is enhanced from Tom Freeman's XBASIC version of TI-Forth. Among its features are: improved random number generator; generalizing of all words that reference screens to operate according to the DISK_SIZE, DISK_LO and disk format; and modification to FORTH-COPY to EMPTY-BUFFERS before copying begins.

Additions include booting to allow for treating two SS/SD diskettes as if a 180-screen diskette were being used; sound and graphics applications included as extra screens with user menu for access; and inclusion of extension words suggested by Leo Brodie in *Thinking Forth*.

Send mailer, two SS/SD diskettes and return postage to Rene LeBlanc, 8719 E. San Lucas Dr., Scottsdale, AZ 85258.

Texnet freeware

Texnet, the Texas Instruments electronic network operating on The Source, offers some 340 downloadable programs at no charge to Source subscribers. For more information, write Texnet at Soft Mail Inc., P.O. Box 745, Rockwall, TX 75087.

Illustrated Multiplication

Runs in console BASIC. Lets children work through multiplication problems with the computer checking each step. Won't teach multiplication but will help kids develop confidence in their skills. Send blank cassette and SASE or \$7 to Larry P. Morgan, 9 Fountain Lake Dr., Greenfield, IN 46140.

Wycove Forth program offered

This program allows the user to get into the heart of the TI's bit-map mode. Not as good as GRAPHX or TI-Artist, but it's free. Features to be added in the future versions, such as printer dump and saving to disk. Make note of what disk format is desired (author has CarComp controller). Any questions regarding Forth may be sent along. Send \$1 and disk to Barry Comer, 2 Cleveland Crescent, Dartmouth, Nova Scotia, Canada, B3A-2L6.

Dragon Storm offered

Written in Extended BASIC, the object is to rescue a princess from an evil dragon. Requires joystick. Score based on obtaining a variety of items and success in rescuing the princess. For disk copy, mail disk and return mailer to: L.E. Benson, P.O. Box 283, Eden, NC 27288. For cassette copy, send cassette and return mailer to Howard Unan, 3913 Sybil Rd., Randallstown, MD 21133. Include \$1 with each order for documentation. Author asks for \$10 if pleased with program.

For radio operators

Two programs offered: Quad and Gamma Match. Quad prompts for single input (frequency of choice) and then provides all details to make a Quad antenna for user's part of the band.

Gamma Match requires several value inputs and then goes through a number of steps to work toward a correct Gamma setting for antenna and coaxial specifications.

Send diskette and \$1 or \$5 for the programs to: Tony Robinson, P.O. Box 76799, Vancouver, British Columbia, Canada, V5R 5S7. Author asks for \$1-\$5 if pleased with program. Asks that it be distributed to other radio operators.

Mail-Call available

Gary D. Watts has entered his Mail-Call program into the public domain. (It was reviewed in the March 1984 MICROpendium.) The mail list program allows users to create, maintain and print mailing lists. It includes a program to allow use of mailing lists with TI-Writer. XBASIC and a disk system are required. The program originally sold for \$25. Send a disk and return stamped mailer to Watts at 1739 Burning Tree Dr., Vienna, VA 22180.

MPG in public domain

Fineline Software has entered its MPG program into the public domain. MPG is used to keep track of mileage for one or more vehicles. MPG calculates mileage to a tenth of a mile for any date range, mileage range or for the life of the vehicle. The program requires XBASIC, disk system and expansion memory. Send diskette, return postage and mailer to Fineline, 3 Wendy Lane, Marlboro, NJ 07746. Or, send \$4 and Fineline will provide the disk, postage and mailer.

SUPERBUG II

SUPERBUG II is an improved version of the Superbugger program released into the public domain by TI. SBUGII includes a 40-page manual and correction to bugs in Superbugger. Enhancements allow changing listing devices, toggling of screen colors, addition of many commands from TI Debugger and others. Send diskette, return postage, mailer and \$5 to Edgar L. Dohmann, Route 5 Box 84, Alvin, TX 77511. Or, send \$10 and the author will provide the disk, postage and mailer.

Disk envelope designer

Catalog Comments Disk Envelope Designer is now being offered as Freeware. The program formerly was sold for \$29.95. Requires XBASIC, memory expansion, disk system, printer and printer interface.

Program allows users to make a paper envelope for each disk. Printed on each envelope is the name of the disk and the name of each program or file it contains. The size and type of each file or program is also printed. Comment lines may also be used to provide additional information about files and programs. Comments are stored on a disk and printed when the envelope function is run. May not work with all printers. Recommended are Epson, TI, C. Itoh and Gemini. Others may also be compatible. Full documentation is included on disk.

Send disk and return mailer, or \$5, to Trio Software, P.O. Box 1115F, Liscomb, Iowa 50148. A maximum \$10 contribution is asked if pleased with program. Redistribution to others is encouraged.

TI-Disk CAT

This program is 100 percent assembly language. Will catalog disks and more than 2,000 files. Outputs a double-column, alphabetized listing providing all critical information. Sorts in less than 45 seconds and loads in less than 7 seconds. Requires E/A, XB, MMM or TI-Writer, expansion memory, disk system and printer system. Send disk and return mailer to Mack McCormick, 215A Yorktown Dr., Ft. Lee, VA 23801 (HHC, 1ST INF DIV(FWD), APO NY 09137 after Nov. 22).

Filereader for XBASIC

Filereader is used to read most types of files—D/V, D/F, I/V and I/F—and will display those files on the screen, dump them to a printer or create a D/V 80 files to be read by TI-Writer. It requires XBASIC and a disk system. Send a disk and return mailer, or \$5, to: Martin A. Smoley, 6149 Bryson Dr., Mentor, OH 44060. The author asks \$2 from users who are pleased with the program. He asks that it be redistributed free of charge.

Trivia and graphics demo

Trivia and Graphics Demo are being offered by Danny Cox. Trivia allows up to four players and requires a disk system, Extended BASIC and a memory expansion. Users may create their own multiple choice questions. Scores and prompts are displayed continually.

Graphics Demo requires Extended BASIC and a disk system. The program features six graphics screens ranging from a snowman to a tiger.

Send a disk and return mailer for each program to Danny Cox, 1861 The Elms Ave., Memphis, TN 38127. Those who are pleased with the programs may contribute \$5, according to the author. Users are encouraged to copy and distribute the programs.

Free bulletin board

The Techie Bulletin Board is being offered as Freeware. The program requires four single-sided disks and includes documentation. Features include a message base, Sysop chat, check for mail, listing of users, expert mode and user verification of status. Planned improvements include true Terminal Emulator II file transfers, two and three-way conferencing, and 1200 baud compatibility. (See August MICROpendium for more information.)

Techie requires a disk system, Extended BASIC, expansion memory RS232 card and 300 baud modem. Send four single-sided disks with return mailer to: Monty Schmidt, 525 Wingra St., Madison, WI 53714.

Program proofreader

Proofreader is an XBASIC program that checks the entry of BASIC program statements for correctness. The program takes each character entered into a statement and manipulates its ASCII value to produce a unique sum for that statement. This "checksum" is then compared to a known value for the correct statement. If a match occurs, the entry is considered to be correct. The checksum produced by Proofreader is a two-digit alphanumeric code. Proofreader does not check for syntax or logic errors.

The program requires a memory expansion. Send diskette and return mailer and postage to Daniel F. Norling, 3120 Fourth St., No. 17, Santa Monica, CA 90405.

Applications software

Fred Guyton is offered several applications programs, including: Checkbook Manager—keeps track of over 1700 checks on SSD disk. Tracks check number, date, receiver, category and amount. Also keeps up with tax deductible items, and when the check clears for easy balancing. Budget-V—lets you define categories you want to track, update when required and get cash flow summary. Can interface with Checkbook Manager.

Mailist—Maintains list of more than 1000 names on SSD disk. Alphabetize, prioritize by ZIP code and sort. (These programs require XBASIC, expansion memory and a disk system.)

Financial Decision Analysis—calculates loan parameters for given present value. Also calculates compound interest, annuities due and more.

Disk Catalog—resides on disk to give quick disk catalog from XBASIC on the screen or to a Gemini or compatible printer. (These two programs require XBASIC and a disk system.)

Write to Guyton at P.O. Box 367, Estill Springs, TN 37330 for information or send initialized disk with stamped, self-addressed mailer.

Classified

Policy

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

The publisher offers no guarantee that any advertisement will be

published in any particular issue. Any damages that result either from errors in copy or from failure to be included in any particular edition will be limited to the amount of the cost of the advertisement itself. The publisher reserves the right to reject any advertisement.

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

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

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

Software for Sale

TI99/4A SOFTWARE

140 programs available, only \$3 each! Not public domain, not translations, not pirated, not brief routines, these are absolutely original, innovative programs utilizing full color and sound capabilities of the TI99/4A. Games, education, music, displays, programmers' aids, etc. Catalog \$1, refundable. Tigercub Software, 156 Collingwood, Whitehall, OH 43213. v3n2

ATTENTION PROWRITER AND EPSON COMPATIBLE PRINTERS CHARACTER SETS AND

GRAPHICS DESIGN I, as reviewed in the May MICROpendium, includes 10 character fonts for only \$17.95. CHARACTER SETS AND GRAPHICS DESIGN II, includes 8 character fonts, a BANNER program that uses all fonts and a choice of 65 graphics (uses an assembly language routine for fast printer output) for only \$12.95. SCREEN IMAGE DUMP VS2 is 100 assembly language and features normal and double size dumps, invert video, single keystroke dump during keyboard reads, starting and ending screen line and tab spacing for only \$16.95. All programs require disk system, memory expansion and compatible 8-bit dot addressable graphics printer. CSGDI and CSGDI require Extended BASIC while SCREEN IMAGE

Mini-Memory or Editor/Assembler. Please enclose PRINTER NAME when ordering or send for more information to DAVE ROSE, 2781 RESOR ROAD, FAIRFIELD, OHIO 45014. v2n11

NUTS & BOLTS

A diskfull of 100(1) utility subprograms for the TI99/4A in X BASIC MERGE format, ready to merge into your programs. With documentation, just \$19.95 postpaid! And now ready, NUTS & BOLTS -2, another diskfull, another 100 subprograms, also \$19.95, or both for \$37 ppd. Tigercub Software, 156 Collingwood, Whitehall, OH 43213. v3n5

INFOCOM SUPPORTS YOUR TI 99/4A

with 13 of its Interactive Fiction titles! The best-selling computer entertainment of all time—the **Zork** trilogy. 1985's #1 best seller—the **Hitchhiker's Guide To The Galaxy**. The tales of adventure—**Infidel** and **Cutthroats**. The mysteries—**Witness** and **Deadline**, the first computer mystery. The magical fantasies—**Enchanter** and **Sorcerer**. And science fiction—**Starcross**, **Suspended**, and **Planetfall**. For more details, write Infocom, 25 Cambridgepark Drive, Cambridge, MA 02140. To order, call toll-free 800-262-6868. (All require 48K expansion, disk, and one of the following: Extended BASIC, Mini-Memory, or Editor/Assembler.) v2,n12

TI99/4A NEW SOFTWARE

USA States and Capitals Game, Fun and Education, Excellent Hi-Res graphic

map, Sound and Color, Instruction Screen, 1 or 2 players, Tutor Mode, Tutor includes State Nicknames, Runs in TI-BASIC, No extra memory required. Send \$12 for cassette or \$1 for more information to: TRINITY SYSTEMS, Dept. TI USA, 1022 Grandview Ave., Pittsburgh, PA 15237. v2n12

ASSEMBLY LANGUAGE PROGRAMS

BUDGET MASTER—\$14.95—and RACQUETBALL PLUS—\$9.95. On disk. For Source Code add \$4.95 each program. Send Check or Money Order, plus \$3.00 S and M to: Carl Koehler, 4007 Annie Street, Alexandria, Louisiana 71301. (318)448-1655. v2n12

QUIZ GENERATOR

ALL-PURPOSE QUIZ GENERATOR for TI99/4A—This program allows you to create your own computer-generated quizzes on any subject. Features include fill-ins, multiple choice and full editing capabilities. This program makes a great study aid. Requires Extended BASIC. Product carries a full money back guarantee. Please specify cassette or disk version. Send check or money order for \$9.95, \$1.50 shipping and handling, to: JSTI Software, 70 Stanson Dr., N. Attleboro, MA 02760. v2n11

ARCADE GAMES

TI99/4A Arcade game software. Five X BASIC games on cassette only \$12.50, diskette \$17.50. Send stamp for catalog. Best Software, P.O. Box 22446, Baltimore, Maryland 21203. v2n11

Classified

SOFTWARE FOR SALE

Business, data and game programs available on cassette or disk. Extended BASIC required. Free catalog. (513)825-6645. Extended Software Co., 11987 Cedar Creek Drive, Cincinnati, OH 45240. v2n11

MYARC EXTENDED BASIC

Accepting ADVANCE orders only! Write for more information. \$79.95 shipping included. Send check or money order to: Textaments, 53 Center Street, Patchogue, NY 11772. v2n10

TI99/4A INTERACTIVE ADVENTURES

"Temple of Terror" and "Cave-In." Ransack an ancient and deadly Greek temple, avoiding traps, cobras, and the feared Brotherhood! Or explore a cavern to find the lost gold bullion, while avoiding outlaws and hazards enough to test your deductive abilities to the limit. Send \$10 (BASIC cass.), \$12 (XBASIC-cass.—Harder!), or \$15 (XBASIC Disk—Most Complex!). NEW thrilling outer space adventure "DEATHWHEEL" Requires Adventure Module. \$10 (cass.) or \$12 (disk). FOX-WARE, 1853 Newton St., Las Cruces, NM 88001 v2n11

Hardware for Sale

TI99/4A Expansion Boxes, etc.

TI Expansion Boxes, \$129; Tandon TM-100 Disk Drives, \$129; TI Disk Controllers, \$109; TI 32K Cards, \$89; RS232 Card, \$75. Prices and shipping. Most unused in original cartons. Write Richard 1114 Camelot Way, Oxnard, CA 93030, or call 805-983-3219 after 9 p.m. Pacific time. v2n10

EVERYTHING FOR SALE

Second Hand TI99/4A, Expansion System, Accessories and programs in Original condition. Write to Peter Chalamish, 110 Post Ave., Apt. 104, NYC, 10034. Dirt Cheap. v2n10

DISK DRIVES FOR SALE

Fully TI Compatible. Canon MDD210 DS/DD full-height, 6ms speed, direct

driven, \$75.00 each. Sanyo SM548D DS/DD slimline, 6ms speed, QUARTZ driven, \$135.00 each. Shipping included. Send check or money order to: Textaments, 53 Center Street, Patchogue, NY 11772. v2n10

MYARC PERIPHERAL CARDS

32K card, \$117.00; 128K card, \$199.00; 512K card, \$299.00; Disk Controller card, \$169.00; RS232 card, \$89.00. Shipping included. Send check or money order to: Textaments, 53 Center Street, Patchogue, NY 11772. v2n10

MYARC 512K UPGRADE

For present Myarc 128K cards. Upgrade to a full 512K for only \$149.00. Shipping included. Send check or money order to: Textaments, 53 Center Street, Patchogue, NY 11772. v2n10

CC-40

CC40

CC40 owners, expand your internal memory to 18K for only \$35.00 post paid. Compatible with all CC40 software and hardware. For more information, contact MICRO-REP, 4413 CORNELL DRIVE, GARLAND, TEXAS 75042. v2n10

Services

COMPUTER REPAIR

Repair or Exchange of all TI99/4, 4A and CC40 equipment available at competitive rates. For estimate send SASE to MICRO-REP, 4413 CORNELL DRIVE, GARLAND, TEXAS 75042. v2n10

ADVENTURE EDITOR—

(Continued from Page 45)

printer is an extremely useful option with this program. There is a lot of information to keep track of when writing an adventure game. If a printer is not available, it will entail either a lot of writing or a lot of planning before

beginning to enter a program.

When printing out A.P.L. code, the program uses a long version of the commands. That is, when code is typed, the programmer is actually using a short version of the commands for speed while the long version is printed for clarity. This package also comes with a program that lets one convert existing Scott Adams adventures into a form usable by the editor. These games may then be listed, altered or saved to a different medium. This program is an asset to the package since studying these adventures can provide valuable insights into how to create effects. It also can help to clarify the manual.

Documentation: A 74-page, bound manual comes with the Adventure Editor. This is the one part of this package with which I find fault. There are several strange word usages, such as, "Both versions *own* the same commands and features..." (italics mine). There is even one double negative! Aside from grammar, though, I thought that the manual could have explained some things more clearly. The manual does, however, provide several programming examples. As mentioned above, the existing Scott Adams' adventures also provide full-length examples. I would recommend that the entire manual be read before starting to program.

Value: This package is unique. It is the only product of which I am aware that allows the (relatively) easy creation of professional quality adventure games. While A.P.L. has some annoying eccentricities, these are the fault of the adventure module and not of this program. While the manual could be improved, the ability to examine existing adventures compensates for the deficiencies.

Tex-Comp recently released four new adventures written by Scott Adams, who used this package to create them. These are selling for \$19.95 each. For the \$29.95 that this product costs, an infinite number of adventures becomes available, given some time and effort.

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