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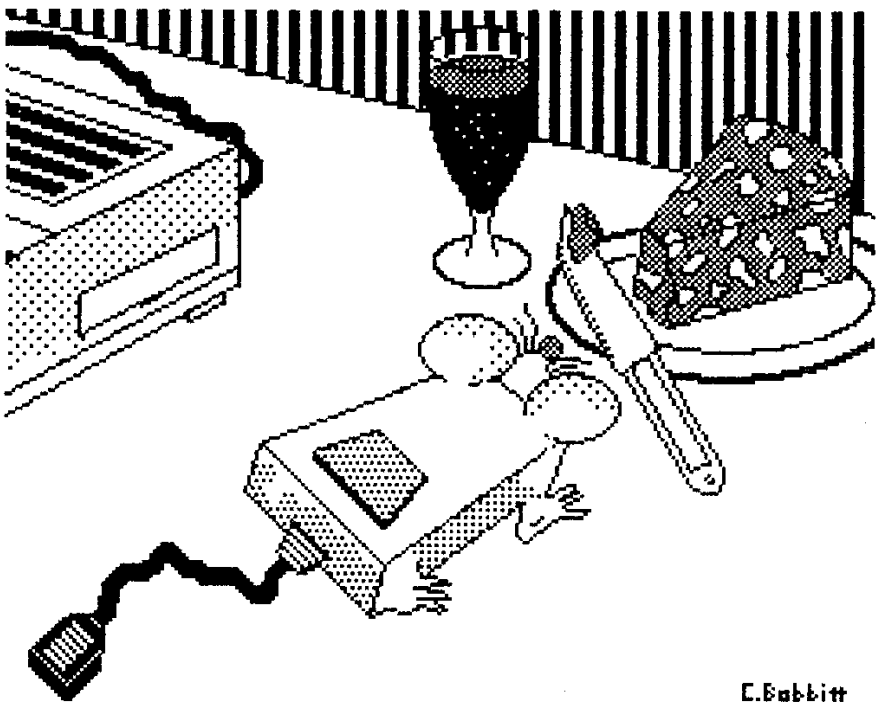
Covering The TI99/4A Home Computer And Compatibles

Volume 2 Number 9 October 1985 $1.50



C.Babbitt

Faire to show new computer—Page 14

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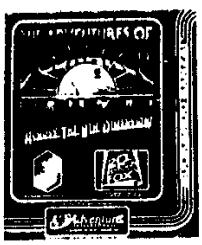

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Laura Burns ..... Editor

Coming next month

—Review of Z80A and 80-column cards
—Part II of Mack McCormick's assembly language tutorial
—A full report on the Chicago TI Faire
—More on the new computer

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Table of Contents

The TI Faire

Big doings in Chicago. The third annual TI Faire promises the debut of Myarc's new 256K compute.....Page 14

Tiny CAL

Here's a program that lets you keep track of the date, no matter what year.....Page 16

Graphics winners

Winners of MICROpendium's graphics design contest are announced (check the cover for first place).....Page 18

The joy of hex

Part I of Mack McCormick's assembly language tutorial, with much more to come.....Page 20

Computer aided design

Creating a floorplan has never been so easy.....Page 32

New products from Europe

Mechatronics introduces Extended BASIC II Plus. Other products include a mouse and EPROMer.....Page 39

Reviews

4A/TALK.....Page 42
Extended BASIC II Plus.....Page 44
XB Detective.....Page 46
Console Writer 2.1.....Page 47

Newsbytes

Winchesters are available, new SST program facilitates compiler, and Enterprise Software introduces games and business programs.....Page 50

User Notes

Getting a CALL SAY to really talk numbers, Print File tips and bomb-proofing TK-Writer.....Page 52

Classified.....Page 54

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Comments

This is quite an eventful issue of MICROpendium (at least for me and Laura). First, it's 56 pages, our biggest yet. Second, you'll find articles announcing the new TI compatible computer and an enhanced version of Extended BASIC. Exciting stuff.

Although we indicated last month that there would be an article about the Foundation Computing 80-column card/Z80A card this month, there won't be. Instead, I'll tell you about it in this column. First, the 80-column card can be used only with the Z80A card. It cannot beused with any existing software for the TI99/4A. However, it performs magnificently in conjunction with the Z80A card. A user with both cards has an 80-column CP/M compatible computer in the Kaypro format. I have found sources for CP/M compatible software that seem to be quite a bit cheaper than local computer stores. Software such as Microsoft BASIC, Word Star, etc. are available at relatively cheap rates through ads in Computer Shopper, a monthly tabloid that includes an enormous amount of advertising. Z80A users who look hard enough should be able to find leads or sources for useful software at rates that make list prices look like highway robbery. But you will have to look hard, there's a lot of fine print in those ads. We will have a review of the Z80A/80-column system next month.

NEW FREEWARE POLICY

Thanks to a suggestion from the TI Users Group of Will County (Illinois), we have a new Freeware policy. Beginning next month, MICROpendium will carry additions to the Freeware column in each issue as they arrive. The entire Freeware listing will be published every two or three months, depending on how long it is and how much space is available. Why we didn't think of that I don't know, but we do appreciate suggestions that improve the magazine.

TI FAIRE COMING UP

The third annual Chicago TI Faire is coming up the first week of November and, according to an article elsewhere in this issue, promises to be eventful. The much talked about new computer may be introduced there, among other things. If you happen to be in the area, as they say, drop in.

Not to forget our European readers, British TI users are holding their third TI99/4A Convention Oct. 26 in Birmingham, England. Last year's Faire in Brighton attracted some 600 users. According to our British correspondent, there are some 70,000 TI users in the country. We anticipate a report on the British users in the next month or so.

ON COMPATIBILITY

We seem to be getting to the point where TI users will either be using CorComp Inc. peripherals or Myarc Inc. peripherals. Given that one of the companies is on the West Coast and the other is in the East, we see an East-West split. This division may be accentuated with the introduction of Myarc's new computer, since the company says it will be compatible only with its products and TI-manufactured products. Hence, apparently, CorComp's terrific disk controller/manager won't work with the new computer. Hence, compatibility problems may surface regarding Peripheral Expansion Box cards manufactured by other companies.

It is probably not the case that any company, nowadays, is intentionally making its products incompatible with those of other manufacturers. But it may be that things could be done to make various products compatible. It's a difficult position for a manufacturer to build compatibility into its products. Doing such may cost him potential customers. Not making his products compatible may have the end result of reducing his potential market. One day the TI market may consist of CorComp compatible and Myarc compatible...West and East....

Regarding new product rumors: an IBM card for the TI is in the works, but not imminently. There's been some discussion of this on various electronic bulletin boards, but the word from a reliable source is that a deal with a supplier fell through and the project is on hold at this time.

—JK

Reviewed in MICROpendium

1984

February: B-1 Nuclear Bomber, Tandon TM-100 Disk Drive, Void, Beanstalk Adventure, Microsurgeon, On Gaming, Database 500

March: Star Trek, Escape From Balthazar, Garkon's Getaway, Sky Diver, Mail-Call, Prowriter 8510 Printer

April: Monthly Budget$ Master, Budget Master, Home Budget, Thief, Donkey Kong, Khe Sanh

May: Companion Word Processor, Q*Bert, Mad-Dog I & II, Programs for the TI Home Computer

June: Creative Expressions Accounts Receivable/Accounts Payable, CDC 9409 Disk Drive, Starship Concord, Lost Treasure of the Aztec, ASW Tactics II

July: Theon Raiders, Introduction to Assembly Language for the TI Home Computer, Game of Wit, Pole Position

August: TE-1200, Tower, Galactic Battle, Galaxy

September: Wycove Forth, 99/4 Auto Spell-Check, 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

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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*

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Feedback

Printing in German

Regarding TI-Writer, I frequently have occasion to write letters in German. There are several unique characters in that language (as in most languages) and my Gemini can print them out. I had been simply using the #,[,], etc., which sent the correct code to the Gemini; the printout looked fine, but the text on the screen was difficult to read because of the nonstandard characters. One day I tried the German menu selection on the initial screen, and lo and behold! The German character set appeared, and, what is more, the character code matches that of the Gemini. These characters are not, however, in the upgrade program file CHARA1, but seem to reside in the module, so that the true lowercase feature is lost. This is a small price to pay, I believe, for having the correct foreign characters on the screen. Since these characters are in the module, the software loaders can't use them. This feature is totally undocumented, but should be valuable for anyone writing frequently in a foreign language, including for school. It is fun to see how accessing the editor from the various languages in the menu changes many of the screen characters.

Bernhard F. Muller
Milan, Michigan

Typos in article

Thank you for printing my article "Taking Control of CTRL U" [September 1985]. It was great to think that my efforts might actually assist someone else in their work with TI-Writer. I am curious to know if anyone runs into problems using the technique with a printer other than a Panasonic.

Please let your readers know that what was apparently a typesetting error occurred on page 20. Exactly one line of my copy was omitted, resulting in the following nonsense: "For example, the in-text symbol ".3" would indicate the start of a certain command and the similar in-text symbol keystroke used to enter . . ." The copy should read: "For example, the in-text symbol ".3" would indicate the start of a certain command and the similar in-text symbol ",3" would indicate its termination. However in his system the keystroke used to enter . . ."

In the "start" column of Table 1 the symbol " '0 " should appear after "proportional pitch."

William J. Bullock
Columbus, Georgia

That darn cat

My wife's house cat is so interested in computing that he has devoured my September issue of MICROpendium. After tearing out the middle three pages, he was so tired he decided to take his nap on the remaining pages.

I'm glad you expanded to 48 pages because I can read the rest until you can send me a new one for my collection. I enclose $1.35 for the September "back" issue.

Charlie Howard
Dallas, Texas

Power supply version

I have recently come across another version of the TI99/4A console power supply here in Toronto. The number on the foil side is PWB 1053201-0002 REV F and the numbers on the component side are ASSY 2704130, SCH 2704129. This is available with the wall mounted transformers. They are brand new.

I would like to issue a warning in that before you install these in your console that the voltages be checked as five out of five registered only -3.0 to -3.3 volts DC (should be at least -5.0 to -5.2 VDC).

I am still sorting out the problem but think it is the switching chip "RC4193NB" or the toroidal transformer.

Has anyone else found these power supplies in their surplus market and does anyone know where I can possibly get a schematic of this board? I believe this is the latest version of power supply because there is no provision for an indicating LED, so it must be for the grey plastic console.

Randy Rossetto
Toronto, Ontario

Compatability urged

Re Brad Harris' letter in your August issue, I too am experiencing the same problem.

I purchased the Prowriter feeling that it was a far superior printer than most being offered in this area. Nothing has made me change my opinion *except* the incompatibility between it and the screen dumps for most programs written for the TI. However, Mr. Harris can take heart—there are people who recognize that not all printers are Epson compatibles. One of these is Dave Rose of Bright Micro Komputers (see your software for sale section). Mr. Rose has what I consider to be one of the very best programs I have seen for the TI in his Character Set and Graphic Design program (reviewed in your May issue). This program is available in a Prowriter version and does an excellent job of showing off the fine graphics capabilities of the printer. Also available is a Screen Image Dump (written in assembly language)—again another fine program although it does not enable one to dump graphics from TI Artist, GRAPHX or the like. I would also like to add that both these programs are an *excellent* buy for the price being asked.

It is a shame that more software writers do not take into consideration the incompatibility between various makes of printers. Mr. Rose seems to have solved the problem quite nicely—his screen dump works with both Epson compatibles and Prowriter compatibles (the two brands most often referred to in articles dealing with TI printers). I am sure that one who is familiar with assembly language could easily do a "quick fix" to give a program dual compatibility but that does not help the rest of us. A plea to

(Please turn to Page 12)

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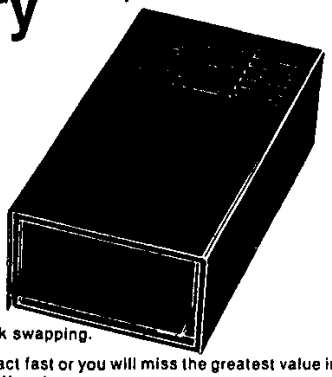

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Feedback

(Continued from Page 10)

software writers—don't forget there are other printers out there. Surely the market would expand for sale of their programs if it would work on more than one type of printer.

Alan C. Fox
Regina, Saskatchewan

Control key after REM

Two readers independently described the same phenomenon in slightly different ways in August.

If you use a control key after a REM, you get a word after recalling the line to the screen. Stephen Shaw uses Function X and Jimmy Creel uses the EDIT command. LIST will do it, too. It is also unnecessary to fill up four screen lines. One key stroke will give you one word.

Enter this: 1 REM (space), then keep Control depressed and press all the keys in the top row in turn (1 to =). Then 2 REM, and do the same for the second row of keys. Similarly, enter the third and fourth rows. Then LIST this pseudo-program, and all the words produced by control keys will appear on the screen. They turn out to be some of the TI BASIC reserved words. A few of the keys produce a jumbled collection of spaces and symbols instead.

Now try to use one of these control keys in immediate mode, say Control ; Instead of PRINT, BAD NAME appears. The same thing happens if you try it as a program line. But try a simple program, using control keys instead of reserved words, and begin every line with REM. Then remove all the REMs in EDIT mode, and the program runs normally.

If someone could find a way out of the REM problem, we would have simple double key entry for many of the reserved words in TI BASIC.

Terence Mahoney
Fort Lauderdale, Florida

Hail to the heroes

I can stand it no longer! I have kept silent too long! It's time for me (at least) to take up my TI-Writer and say thanks to several super-heroes in the TI community.

First to...all ...that put *MICROpendium* together....May you grow so big that I won't be able to get you into my three hole punch.

Next, to the Three Wise Men in Ohio: Clulow, Gries and Romer. Where did these mysterious people come from? How did they gain their vast knowledge of TI electronics and the 9900 assembler? Do they have time to eat and sleep? Were they transplanted here from some intellectually superior planet to spread the "word" (it being 16 bits)?

Thirdly, to Danny Michael, Fredrick Hawkins, Tom Knight and all others out there supplying us with quality software at affordable prices. Call it "radically distributed," "freeware," "cheapware," or anything you like—it all boils down to great bargains for us. And shame on those who are using these quality utilities without sending their authors the pittance they request. We must all do what we can to support these creative minds so that they will continue to provide us with their brain children.

May the Great Monitor bless Dr. Guy-Stefan Romano. The services he provides with Amnion are incredible! He provides us with quality public domain software at a low copy cost. He solves the problems—no matter how esoteric—of any who call on him. He gets people together. And, with his fantastic mind, remembers who you are be you from this continent or several others.

Lastly, accolade to the many Sysops out there that are providing us with volumes of information and a chance to speak out, sell used equipment, etc. They are not in this for the money—indeed, many have inherited enormous headaches. Whenever I feel down in the dumps about living down in the dumps, I can press a few buttons and flick a switch and be in touch with the civilized world.

Rumor has it that the TI is a dead computer. Please don't aid in spreading this vicious lie—after all, if this were true, why is it that all the good hardware and software is just now coming out.

Jeffrey Speeth
Port Allegany, Pennsylvania

Unsafe to recharge

We note in Volume 2, Number 5, Page 8, an article entitled "Recharge." It should be pointed out that generally it is *unsafe* to recharge primary batteries unless they are specifically labeled as "Rechargeable."

Recharging nonrechargeable batteries can result in leakage and/or cell rupture, resulting in equipment damage and/or personal injury.

T.L. Telzrow
Mgr. of Standards & Product Safety
Union Carbide Corporation
Battery Products Division
Cleveland, Ohio

Another trip

A related note to Jimmy Creel's routine in the August issue: I have a statement that when entered causes the computer to completely TRIP out in a halfway similar manner to what Jimmy's routine will do. Type in the following statement in TI BASIC only: DIM A(4094)

As Jimmy mentioned I also do not have an answer to this strange occurance.

Gary Cox
Memphis, Tennessee

User's wish list

WANTED!

A program that does all or part of the following: provide a calculator, a notepad, the time—as does the "Sidekick." The program would be loaded into low memory so it could be used when in Extended BASIC with a statement like CALL LINK("CALC") or CALL LINK("NOTE").

(Please turn to Page 12)

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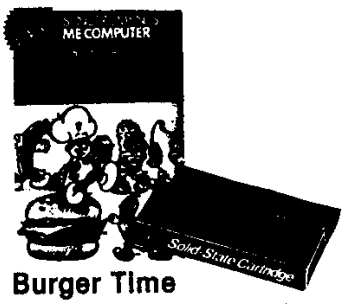

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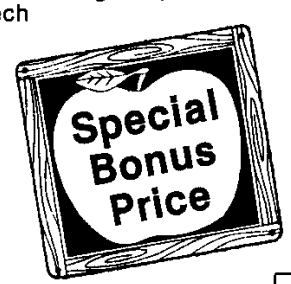
Facemaker

Creative fun for children ages 5 to 7. Provides very simple introduction to programming and familiarity with keyboard



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Feedback

(Continued from Page 10)

I know of one such program, "PC-Keys" by Techni-Graphics, 443 Perrie Dr. #302, Elk Grove, Illinois 60007, that is along the above lines for redefining keys and have one that sets up a clock which can easily be reset by SUBFILE 99 on the "Best of 1984 disk" ("TIMERB"), P.O. Box 533, Bowling Green, Ohio 43402.

A full set of these utilities would sure be a useful tool, especially if one had a printout option.

Bill Harms
Chino, California

Freeware change

Being authors of a freeware program, we feel that MICROpendium is an excellent outlet for informing users of new freeware offerings. We had sent in a letter asking that you include our program in your September issue. Well, it looks as though we missed your September deadline as our program is not included in the september issue. Under your current policy, our program will now be available over three months before it appears in MICROpendium. We suggest that instead of publishing freeware listings every two months, that you publish a complete listing every three months, BUT also publish any new freeware notices on a monthly basis. We feel that this would keep the TI user informed of the latest programs available, and allow you more space in each issue.

Robert Neal and Ed Burt
Romeoville, Illinois

A great idea! We'll do it, starting next issue, printing complete Freeware listings every two or three months.-Ed.

More on TI-Writer

To Stanley Page of Vancouver, British Columbia, (June 1985 Feedback) I have a suggestion about your TI-Writer problems. Either the low memory portion of memory card may be bad, or the connection to it may be bad (probably the latter). The Disk Manager module doesn't use the memory expansion, and the Extended BASIC module only uses low memory if you have loaded machine code into it. I don't know about Personal Record Keeping, but I would bet that if it uses the low memory area, it is for storing of data only (which could be corrupted without necessarily "crashing" the program).

On the other hand, EDITA1 entirely fills the low memory area, and is the bulk of the EDIT program. The locking up is most likely caused by the machine code in low memory being corrupted. I also had this problem and solved it by re-seating my memory card, cleaning the I/O port (side port) and flex cable contacts, and finally **carefully** inserting the cable back into the port, checking to see if any damage had been done previously. Since those minor repairs, I have not had one crash. Good luck; I hope this does it for you.

Curtis Alan Provance
Merrimack, New Hampshire

Disk drives

I have a fully configured system with a single disk drive, 32K memory, RS232 and disk controller in a PEB. I read in another magazine that the IBM uses the same S/S disk drive as the TI, and that they are interchangeable. I just happened to come up with one of these and decided to add it to my system. First problem—power supply! On the assumption that if the PEB will run two half-height drives, it should carry the load of two full-sized drives, I hooked into the power supply of the PEB to power the second drive. I should mention at this point that the second drive has the resistor pack missing. Both drives worked great, and addressed normally; i.e., dsk1 was in the PEB and dsk2 was the extra. Unfortunately the dsk2 would "power down" shortly after it was addressed. After much switching of drives and experimenting, I finally came to the conclusion that there simply wasn't enough power to run both at once. Since I still needed a power supply, and didn't want to send off for one, I came up with another PEB. I'm using the PEB as the power supply for dsk2, with nothing else in it. Works great, if you can stand the noise of two PEBs! Problem: My second disk will address only as DSK3, not dsk2. Since most commercial programs requiring two drives are set up for dsk1 and dsk2, this is unhandy. The only thing I did differently was use two of the short cables that come with the disk drives, instead of one, this to get the extra length to get to the drive in the second PEB. I can't understand what the difference is. My hope is that you or your readers can answer the question.

Darrel Sparkman
Lockwood, Missouri

As far as we can determine, the PEB is not designed to power an external disk drive, just the internal drive. The cabling may have something to do with the DSK3 vs DSK2 problem, but we're not sure. Make sure the DIP shunt of the second disk drive is set up as DSK2 and not DSK3. Readers who have anything to add are encouraged to do so.—Ed.

Adding memory

In the June issue is a way to get 32K from the 32K expansion memory. Do you or any of your readers know of any way to add the 16K or what is left of it to the 24K or 32K of expansion memory and make it all available as a data base? I am working on a program for a directory and need all the memory I can get in order to sort.

Walter Moore
Brackettville, Texas

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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Chicago TI Faire features Myarc's 256K computer

Unveiling of a new TI-compatible computer by Myarc Inc. of Basking Ridge, New Jersey, is planned for the Chicago TI-Faire Nov. 2, according to Lou Phillips of Myarc.

The third annual TI-Faire is scheduled from 9 a.m. to 5 p.m. Nov. 2 at Triton Junior College in River Grove, Illinois, under the sponsorship of the Chicago TI99/4A Users Group.

The new computer has 256K RAM and 64K video RAM, with a capability of addressing two megabytes of main memory, according to Phillips.

The computer supports three display modes, according to Phillips. They are 512x212, 512x424 and 256x192.

Monitor options include composite video or RGB. The keyboard features 84 keys and uses a cable to connect to the TI Peripheral Expansion Box, he says.

Myarc had not established a price for the new computer as of the first week of October.

Phillips is scheduled to be a speaker at the TI-Faire. Other speakers are Mike Amundsen, Subfile 99, and Craig Miller, Miller's Graphics. Admission to the TI-Faire is $2, $1 to card-carrying members of TI users' groups.

Vendors scheduled to be on hand for the TI-Faire include Hunter Electronics, C. & J. Drives, Corporate Disk Co., Tomputerware, Data Systems, MicroFormat, Asgard Software, Bytemaster Computer Services, Competition Computer Products, DataBioTics, J/D Limited, Great Lakes Software, Myarc Inc., Compuserve's TI Forum, Thomson Software and Miller's Graphics.

An arcade game contest and several door prize drawings will be featured at the Faire, according to the Chicago Users' Group.

For further information on the Faire, contact the Chicago TI99/4A Users Group, P.O. Box 578341, Chicago, IL 60657. Phone number for the group's bulletin board is (312) 966-2342.

Myarc shipping XBII

Myarc's Extended BASIC II has been scheduled for shipment the week of Oct. 7, according to Lou Phillips of Myarc.

"We're two months late, unfortunately," Phillips said.

The cartridge, which requires use of Myarc's 128K card, comes with a diskette. According to Myarc, XBII with its 128K operating system, is compatible with TI Extended BASIC and features windowing, 40-character text display, up to three times the speed of Extended BASIC, graphics commands such as draw, circle, fill and rectangle, improved error-handling routines and integer variables.

For further information, contact CR Distributing, P.O. Box 2168, Acworth, GA 30101 or (404) 928-8791.

Canadian firm markets MAXIMEM

A static RAM "universal module" for the TI99/4 and TI99/4A, said to expand the memory to 96K RAM and give the user the ability to dump any module to disk, has been announced.

Guy Gournay of 146178 CAN INC., in Longueuil, Quebec, Canada, says the product, MAXIMEM, also provides the ability to run any module dumped to disk. MAXIMEM works from the computer's power supply.

According to Gournay, MAXIMEM has two sections of 48K RAM: 32K GRAM and 16K RAM (added to the 16K VDP RAM standard and 32K expansion card), resulting in a full 96K RAM available to the user.

He says MAXIMEM starts automatically thanks to an 8K GROM that displays the following choices: TI BASIC, which is unchanged; MAXIMEM, which offers the catalog of modules contained on disk; and Editor/Assembler, which offers an improved TI Editor/Assembler. With MAXIMEM, he says, no other module is needed, and it holds data after quit is typed.

Dimensions are similar to the Navarone Widget or a three-module expander, Gournay notes.

MAXIMEM requires a computer keyboard, disk drive and controller and 32K memory expansion card. He says a cassette version is planned if demand justifies.

Price is $199 Canadian, plus transportation or postage and insurance. He estimates one month delivery time.

To order, or for further information, contact Guy Gournay, 146178 CAN INC., 933 Delorimier, Longueuil, PQ, Canada J4K 3M8 or (514) 651-7280.

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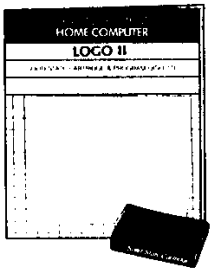
TI Writer

This is a professional word processing system for the TI-99/4A. Provides the features and ease of use found in office systems. Requires disk drive. 32K Memory and Printer. Module and Disk. **$38.95 + S&H**



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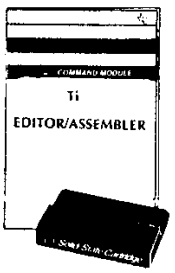
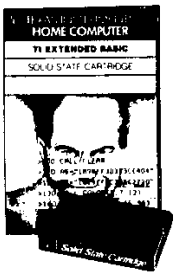


Editor/Assembler

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! **19.95 + S&H**



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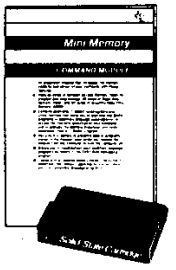

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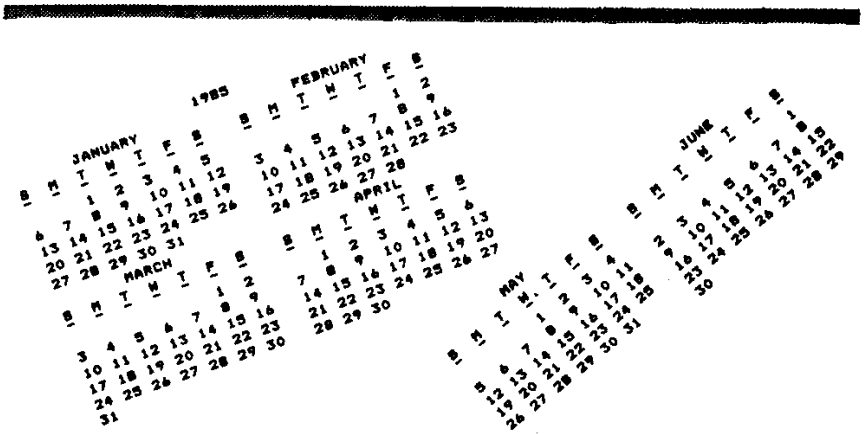
Dates at a glance with TINY/CAL

Companies that produce calendars have one goal in mind: helping others keep track of days, weeks and months. It's a multi-million dollars business with a market that won't quit. Afterall, just about everyone has need for a calendar, every year.

Richard J. Bailey of Gonic, New Hampshire, is listing a number of programs as Freeware. Among them are several that produce and print calendars for any year from 1776 to 2099. These calendars are printed in a variety of sizes using Epson/TI type printers, including Gemini. The program listed here is called TINYCAL and produces, what else, a tiny calendar.



The program can probably be modified to operate using any dot-matrix printer that includes super/subscript characters. Although it is designed for RS232 operation, users may use parallel printers simply by changing the I/O characteristics in line 280. It is in line 280 that the super/subscript characters are accessed. This line may be used as the basis for "miniaturizing" printer output for many programs, including disk catalog programs.

The program requires Extended BASIC.

TINYCAL

```
100 !********************
110 !*       TINY       *
120 !*EPSON/TI CALENDER*
130 !*       BY         *
140 !*RICHARD J. BAILEY*
150 !*68A CHURCH STREET*
160 !*GONIC, N.H. 03867*
170 !********************
180 DIM T(12),D(12),MO$(12):
: CALL CLEAR :: CALL SCREEN(
2):: FOR I=0 TO 14 :: CALL C
OLOR(I,16,2):: NEXT I
190 FOR I=1 TO 12 :: READ T(
I),D(I),MO$(I):: NEXT I
200 DATA 7,31,JANUARY,30,28,
FEBRUARY,8,31,MARCH,32,30,AP
RIL,9,31,MAY,32,30,JUNE
210 DATA 9,31,JULY,31,31,AUG
UST,6,30,SEPTEMBER,30,31,OCT
OBER,7,30,NOVEMBER,30,31,DEC
EMBER
220 DISPLAY AT(5,14):"TINY":
"       EPSON/T.I. CALENDAR":
"":"":"**THIS PROGRAM WILL P
RINT A":"  CALENDAR FOR ANY
YEAR FROM":"  1776 TO 2099."
230 DISPLAY AT(13,1):"**SET
TOP OF FORM AND ENTER":"  TH
E YEAR AS A FOUR DIGIT":"  N
UMBER   (ex. 1985)   OR":"
JUST ENTER TO EXIT PROGRAM"
240 DISPLAY AT(19,1)BEEP:"**
ENTER CALENDAR YEAR" :: ACCE
PT AT(19,24)SIZE(4)VALIDATE(
DIGIT):Y$
250 IF Y$="" THEN CALL CLEAR
 :: END ELSE Y=VAL(Y$):: IF
Y<1776 OR Y>2099 THEN 240
260 IF INT(Y/4)*4=Y AND NOT(
INT(Y/100)*100=Y AND INT(Y/4
00)*400<>Y)THEN D(2)=29
270 DI=Y-1906+INT((Y-1901)/4
):: D(0)=DI+1-(INT(DI/7)*7)
280 M2=0 :: OPEN #1:"RS232.B
A=2400.DA=8" :: PRINT #1:CHR
$(27);"S";CHR$(1);CHR$(15);C
HR$(27);"3";CHR$(14):TAB(19)
;Y
290 FOR I=1 TO 12 STEP 2 ::
PRINT #1:TAB(T(I));MO$(I);TA
B(T(I+1));MO$(I+1)
300 J,K=1 :: A,M1=D(I-1)+M2
:: B,M2=M1+D(I)
310 PRINT #1:CHR$(27);"3";CH
R$(8);"S  M  T  W  T  F  S
  S  M  T  W  T  F  S":CHR$(
27);"3";CHR$(14);"-  -  -  -
  -  -  -    -  -  -  -  -
-  -"
320 IF J>D(I)THEN 330 :: IF
A>7 THEN A=A-7 :: GOTO 320 E
LSE PRINT #1:TAB(A*3-2);STR$
(J);:: IF A=7 THEN 330 ELSE
A=A+1 :: J=J+1 :: GOTO 320
330 IF K>D(I+1)THEN 340 :: I
F B>7 THEN B=B-7 :: GOTO 330
 ELSE PRINT #1:TAB(21+B*3);S
TR$(K);:: IF B=7 THEN 340 EL
SE B=B+1 :: K=K+1 :: GOTO 33
0
340 IF J>D(I)AND K>D(I+1)THE
N 350 ELSE PRINT #1:"" :: A=
A+1 :: B=B+1 :: J=J+1 :: K=K
+1 :: GOTO 320
350 PRINT #1:"" :: NEXT I ::
 PRINT #1:"":CHR$(27);"@" ::
 CLOSE #1 :: RESTORE :: GOTO
 190
```

QUALITY SOFTWARE FOR THE TI HOME COMPUTER FROM JOHN DOW

The **Dow-4 Gazelle** flight simulation program is not a game but a realistic simulation of a typical private, 4-place single engine instrument equipped airplane. The screen shows you the instrument panel of the airplane, with realistic looking dials in the standard arrangement. There are: artificial horizon, directional giro, airspeed and altimeter, turn indicator and vertical speed, VOR and ILS, marker beacon lights, gas gauges, tachometer, flaps indicator, wing leveler and stall warning light. You use the joystick and the keyboard to change power, raise or lower flaps, turn the wing leveler on or off, turn, climb or descend, and so forth. The various dials and lights respond within less than one second on the average. Sound effects include engine noise (which varies with power and airspeed), the stall warning horn, and crash sounds. Although you cannot see the runway, there is a simple display which shows where the touchdown end of the runway is so you can land.

If you are a beginner, the manual will lead you through the fundamentals of flying. If you are a pilot, you can try maneuvers such as stalls, slow flight, and steep turns. If you wish, you can take off, climb to altitude, practice some maneuvers, hold at the VOR for a while, then go out and come back for an ILS approach terminating in a landing. There is also a short field landing option, in which you must clear a 400' obstacle just ½ mile from the field, then touch down on only ½ mile of runway.

The program does not require Extended BASIC or any additional memory. Joysticks are highly recommended (if you do not own a set, specify so when ordering so additional instructions can be included). The program is shipped on cassette unless you specify disk and pay an additional $3 charge.

The **Dow Editor/Assembler** eliminates many of the problems you face with the standard Line-by-Line assembler sold with the TI Mini Memory Module by providing many features, including the ability to save and restore programs on tape as well as to edit them, even after loading and running. Additionally, the Dow Editor/Assembler uses none of the memory in the module. It supports up to 40 labels, each up to three characters in length, and is fast (1 second per statement to save on tape, and 3 seconds per statement to load into memory).

Requires the Mini Memory Module from TI and the TI Editor/Assembler manual. The primer (see below) will be very helpful.

The **Assembly Language Primer** explains assembly language on the TI to help you to learn how to write useful programs in assembly language. It was written to help programmers whose only knowledge of computers is from what they have learned with BASIC. It is to be used with either the Dow Editor/Assembler or the TI Editor/Assembler. Assembly language programming is always very challenging, and you still need the TI Editor/Assembler manual as the computer's reference book. But you will be helped by the many examples, including a detailed "case history" of the various steps involved in developing an actual program to speed up a BASIC program.

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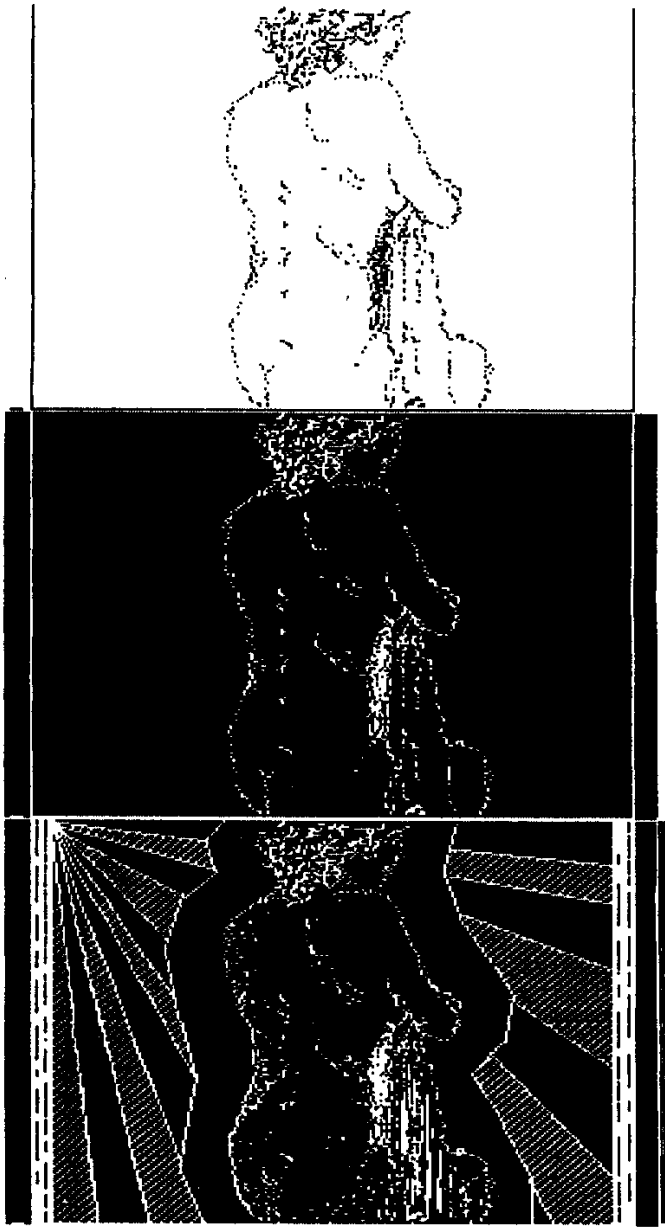


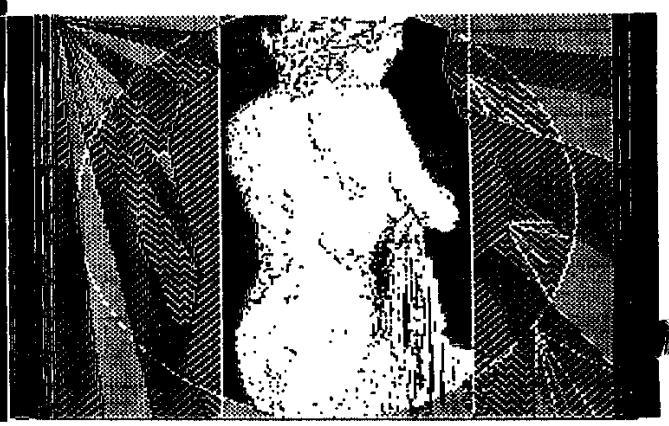
Our trickle of graphics contest entries became a flood toward the end, so that it was hard to select only three.

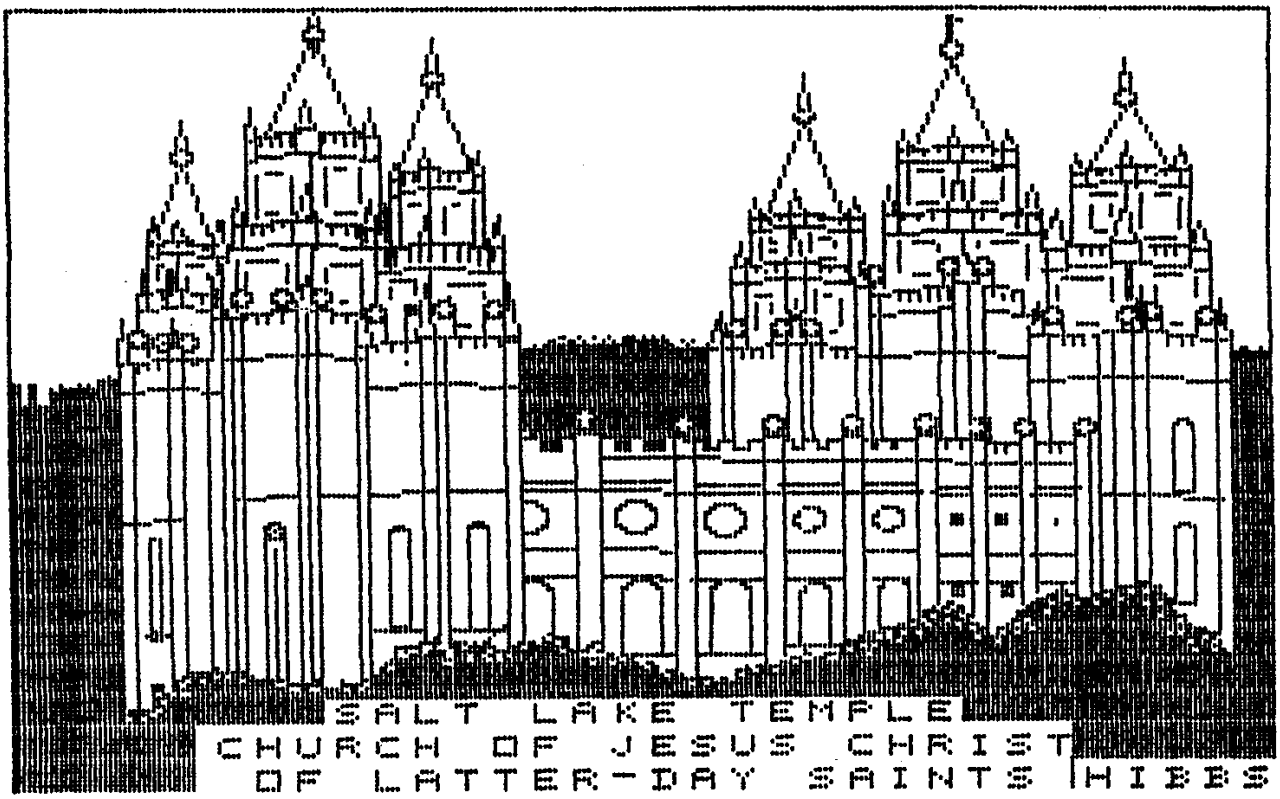
The first prize entry, "Mouse of the House, 1985," and pictured on our cover, created with GRAPHX, was submitted by Asgard Software; the company intends to sell it commercially as part of its GRAPHX Companion II package scheduled to be released soon. The prize award goes to its creator, Chris Bobbitt, a student at the University of Maryland who has also contributed a number of reviews to MICROpendium.

Second prize entry is "My Wife's Back," created by Jeffrey Speeth of Port Allegany, Pennsylvania, with TI-Artist.

The third place "Salt Lake Temple," pictured on the facing page, was created by Charles S. Hibbs of DeArmanville, Alabama, using the Draw 'n Plot program.

My Wife's Back





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The joy of hex

How to get your two bits worth out of assembler

This is the first of a four-part tutorial about programming in assembly language.—Ed.

By MACK McCORMICK

Here are the objectives of this first tutorial: 1. To introduce you to the Hexadecimal and Binary Numbering systems. 2. To introduce you to the assembler instruction format. 3. To introduce you to addressing modes. 4. First program. Adding two numbers and displaying them on the screen. 5. How to assemble.

Just a few words on Assembly language before we begin. It's not as difficult as you may believe. You will be communicating with the microprocessor at the first level above machine language, assembler. As you know, the machine actually communicates in binary 0s and 1s, on or off. Assembler allows us to talk to the machine in a language we can understand (although I'm sure the uninformed would disagree). With these tutorials I will assume no prior knowledge of assembler or other number systems. Please bear with me, I won't insult your intelligence and things will become more complex soon. Stick with the tutorials. Read every book about assembler you can get your hands on.

NUMBERING SYSTEMS

Hexadecimal (HEX) and binary are merely different base numbering systems for counting. It's important we understand both of these systems in addition to base 10, or the decimal system, because assembler uses all three. I will tell you up front that I usually use a calculator designed for these numbering systems but we need to understand the principles also. If you want to get a calculator, and I recommend that you do, there are several inexpensive models on the market. I use the Casio solar-powered fx-451 scientific calculator for $35. It supports HEX, OCT, BIN, LOGICAL OPERATORS and all scientific functions. Works great! Craig Miller, of Miller's Graphics, and others have also published programs which will allow you to use your computer but this has the disadvantage of requiring you to load another program every time you need to make a calculation, a real pain.

BINARY NUMBER SYSTEM

As already mentioned, binary is the native language of your computer. Everything eventually gets converted to binary. Let's look at a decimal number first. As you know decimal means *powers of 10*. Each number represents a power of ten. For example 4175:

```
10^3 = 1000  4 X 1000 = 4000
10^2 =  100  1 X  100 =  100
10^1 =   10  7 X   10 =   70
10^0 =    1  5 X    1 =    5

                         4175
```

Binary numbers can be 1 or 0 only, hence base 2. The individual number is called a bit. A group of eight of these is called a byte. To convert the binary number 00001011 to decimal follow the same procedures you used with the decimal number (ignore any leading zeros):

```
2^3 = 8        1 X 8 = 8
2^2 = 4        0 X 4 = 0
2^1 = 2        1 X 2 = 2
2^0 = 1
               1 X 1 = 1

                    11
```

To make it easier to communicate with the computer we most often use HEX. From now on I will use a > to indicate a number is in hex. Hex is base 16. That is a number may be 0 through 15. To represent numbers greater than 9 we use letters of the alphabet. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F. Just remember to use >A for 10 and count to 15 ending with >F. Let's convert >394F to decimal:

```
16^3 = 4096  3 X 4096 = 12,288
16^2 =  256  9 X  256 =  2,304
16^1 =   16  4 X   16 =     64
16^0 =    1  F X    1 =     15

                         14,671
```

The largest number you may represent in one byte is >FF, or decimal 255. The largest value in a word (two bytes) is >FFFF or 65,535.

Enough on numbering systems for now; we'll cover minus numbers (twos compliment) and additional points as we encounter them in programs.

ASSEMBLER INSTRUCTION SYNTAX

As with every computer language there are certain rules we must follow for inputting instructions. Unlike BASIC, assembler will not give you a warning or error until you assemble the program. Here's the general syntax:
LABEL OPCODE OPERAND COMMENT

Labels must begin in the first column and may be up to six characters long. One or more spaces follow. Next is the *OPCODE*. This is the actual instruction to be performed followed by one or more spaces. Next are one or more *operands* or data for the instruction to operate on followed by one or more spaces. Finally is an optional *comment* which may extend to column 80. Each time we use a new instruction I will fully explain it.

ADDRESSING MODES

There are five general addressing modes and one special addressing

(Please turn to Page 22)

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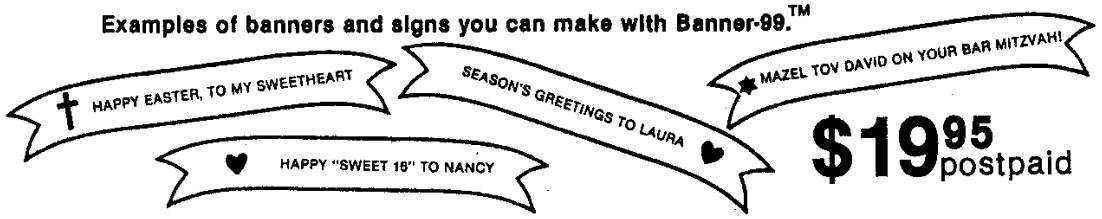

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ASSEMBLY—

(Continued from Page 20)

mode used for assembler instructions. We will examine each one in detail as we encounter them in a program.

There is one type of addressing we need to look at now. We are going to be operating on individual bits, bytes, and words of memory. Think of the computer's memory as a series of small, consecutive pieces of memory laid out end to end. We can address any single byte of memory by hanging a label on it but frequently we must address a byte of memory some distance from that label. Think of it like an array. To get to the fifth byte from the label we could say LABEL+4. We used 4 instead of 5 because we must start counting from 0. Think of it like OPTION BASE 0 in BASIC. Lots more on this later.

FIRST PROGRAM

Enter the program exactly as shown in Fig. 1 using Editor/Assembler.

PROGRAM EXPLANATION

These comments supplement the comments contained in the program itself. Any statement with an asterisk in column 1 is a comment and you may enter anything else on that line.

One fairly unusual thing about the 9900 microprocessor in the TI99 is the ability to designate your own workspace registers anyplace in memory or more than one set at a time. Think of registers as 32 consecutive bytes of memory that are used as your scratch paper for calculations. Thirty-two bytes is of course 16 words of memory. Because this is a 16-bit (1 word) machine (something many of your friends can't brag about) that gives us 16 registers to use for our computations. We place an R in front of the number to designate that we are referring to a register. For example, R0 is register zero and R15 is register 15 (really the 16th word of memory because we started counting with zero.) Here's the detailed explanation of the program:

DEF START

DEFines the entry point of the program so the computer may find it.

(Please turn to Page 24)

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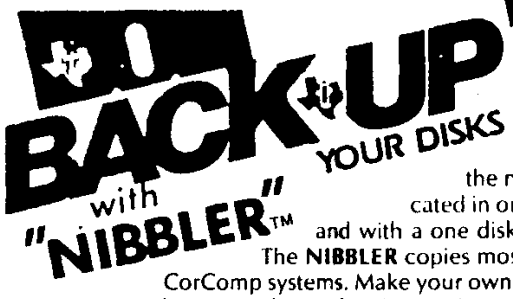

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PROGRAM EXPLAINED—

(Continued from Page 22)

Places the name START in the Reference/Definition table. More on this next time.

REF VSBW,VMBW

REFerence refers to the console routine the program will use. In the advanced tutorials we'll create our own utilities.

WSREG BSS >20

WSREG is the label we decided on for our workspace registers. Could have been any label from 1 to 6 characters long. Block Starting Symbol (BSS) sets aside a block of memory, uninitialized for use as our workspace. >20 means set aside >20 or 32 bytes (16 words) for R0 to R15.

X DATA 10

Initializes one word of memory to 10 (0010). Hangs the label X on that word.

START LWPI WSREG

Load Workspace Register Immediate (LWPI). Tells the computer to use the 32 bytes of memory for our workspace which begin at WSREG. START is the entry point (beginning) of our program.

Logic for clear routine. Writes the space character >20 or 32 to the screen 768 times to the screen to clear it. R0 is the counter. R1 contains the space character. We increment R0 to point to the next screen location and check it against 767 to insure we haven't gone too far.

CLR R0

CLeaRs the contents of R0 to zero.

LI R1,>2000

Load Immediate R1 with >2000.

LOOP BLWP @VSBW

Branch and Link Workspace Pointer to the Video Single Byte Write Routine. Branches to the console routine for writing single bytes of information to the screen. R0 always contains the address on the screen to write to. Briefly, there are 768 screen positions 24 rows X 32 Columns = 768. This routine writes to VDP RAM in the screen image table (SIT) which is 768 bytes long. Any ASCII value you write to the SIT is displayed on the screen. For example to display the number 3 at row one column one, R0 would have 0 in it (because we begin counting at 0) and R1 would contain >3300 or 5100 in it. Note the number to be written is in the left byte of the word. The VSBW routine always writes on the Most Significant Byte and disregards the LSB.

Here's the easy way to remember it: R0 always contains the address in VDP RAM. R1 always contains the address or data in CPU RAM.

INC R0

INCrement R0 by one. Add one to the contents of R0.

CI R0,767

Compare Immediate what's in R0 to 767.

JLE LOOP

(Please turn to Page 26)

```
*****************************************
*                                       *
* THIS IS THE FIRST PROGRAM FOR THE     *
* BEGINNER ASSEMBLER TUTORIAL.          *
* IT CLEARS THE SCREEN, ADDS TWO NUMBERS *
* TOGETHER AND DISPLAYS THE SUM IN THE  *
* CENTER OF THE SCREEN.                 *
* HERE'S WHAT IT WOULD LOOK LIKE IN     *
* EXTENDED BASIC:                       *
* 10 CALL CLEAR                         *
* 20 X=10                               *
* 30 Y=27                               *
* 40 X=X+Y                              *
* 50 DISPLAY AT(12,15):X                *
* 60 END                                *
*****************************************

* THIS PART OF THE PROGRAM IS THE INITIALIZATION *

       DEF  START  THE PROGRAM NAME IS START
       REF  VSBW,VMBW CONSOLE ROUTINES WE ARE GOING TO USE
WSREG  BSS  >20    SETS ASIDE A BLOCK OF 32 BYTES FOR USE AS WORKSPACE REGISTERS
X      DATA 10     COULD HAVE USED >A INSTEAD OF 10 (LIKE X=10)
Y      DATA 27     (Y=27) COULD HAVE ALSO SAID Y EQU 0027
TEN    DATA 10
ANS    DATA 0        WORD TO PUT ANSWER IN. INIT TO 0.

* PROGRAM BEGINS HERE
*-------------------------------*
START  LWPI WSREG    LOAD WORKSPACE POINTER IMMEDIATE. POINT TO OUR WORKSPACE.

* CLEAR THE SCREEN
       CLR  R0       CLEARS R0 TO ZERO (BEGINNING OF SCREEN IMAGE TABLE)
       LI   R1,>2000 LOAD IMMMEDIATE R1 WITH >2000. VSBW ROUTINE WRITES THE LEFT
LOOP   BLWP @VSBW    BYTE IN R1 ALWAYS. IN THIS CASE >20 OR 32 OR SPACE CHR
       INC  R0       ADD 1 TO R0
       CI   R0,767   COMPARE IMMEDIATE R0 TO 767
       JLE  LOOP     IF ITS LESS THAN OR EQUAL JMP (GOTO) LOOP

* ADD THE NUMBERS TOGETHER AND CONVERT TO ANCII
*-------------------------------*

       A    @Y,@X    ADDS X TO Y AND PLACES RESULT IN X
       MOV  @X,R6    MOVE WHATS AT X TO R6
       CLR  R5       CLEAR R5
       DIV  @TEN,R5  DIVIDES 10 INTO 37. QUOTIENT IN R5. REMAINDER R6.
       AI   R6,>30   ADD IMMEDIATE ANCII OFFSET TO R6
       MOV  R6,@ANS  MOVE CONTENTS OF R6 TO THE WORD ANS
       MOV  R5,R6    MOVE CONTENTS OF R5 TO R6
       CLR  R5       CLEAR R5
       DIV  @TEN,R5  DIVIDE 10 INTO R5, R6
       AI   R6,>30   ADD IMMEDIATE ANCII OFFSET >30 TO R6
       SLA  R6,8     SHIFT LEFT ARITHMETIC R6 8 BITS.
       MOVB R6,@ANS  MOVE MSBYTE R6 TO R1
*-------------------------------*
* DISPLAY ON THE SCREEN AT ROW 12 COLUMN 15

       LI   R0,366   POSITION ON THE SCREEN IS 366
       LI   R1,ANS   LOAD R1 WITH THE ADDRESS OF ANS
       LI   R2,2     TWO BYTES TO WRITE
       BLWP @VMBW

       JMP  $        PREVENTS THE PROGRAM FORM ENDING SO YOU MAY SEE THE RESULT

*-------------------------------*
* RETURN TO THE CALLING PROGRAM

       CLR  @>837C   CLEAR THE STATUS BYTE
       LWPI >83E0    LOAD GPL WORKSPACE REGISTERS
       B    @>0070   BRANCH TO THE CALLING PROGRAM

       END
```

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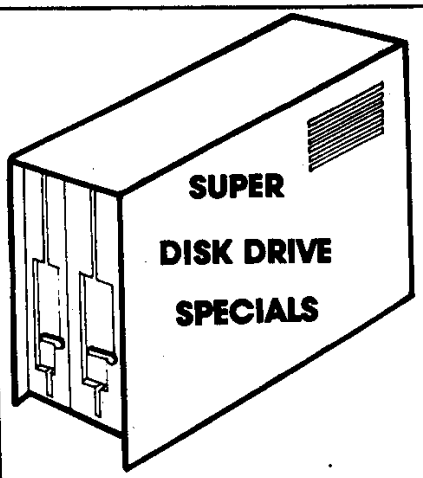

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LOGIC FOR ADDITION—

(Continued from Page 24)

Jump Less than or EQUAL to the label LOOP. IF R0 < =767. THEN GOTO LOOP.

Logic for the addition routine. We add the two number together. Because only ASCII numbers may be displayed on the screen we must add >30 to each byte before we display it. In this case our number is 37. We must place a 3 and 7 on the screen. To do this we divide 37 by 10 resulting in a quotient of 3 and remainder of 7. We add >30 to the 7 to make ASCII >37. We move this value to the right most byte of our ANS word. We then divide 3 (old quotient) by 10 resulting in 0 quotient and 3 remainder. We again mask up by >30 and shift it left 8 bits (1 byte) in the register. We then move this byte to the left (MSB) of ANS. ANS looks like >3337 when we're finished.

A @Y,@X

Adds two words of memory. Places the sum in the second operand. May also use registers (eg. A R0,R1). Adds what's at the word of memory with label Y to what's at the word of memory label X.

DIV @TEN,R5

DIVides uses two registers. In this case R5 and R6. Divides what's in R6 by what's at TEN or 10. The quotient is placed in R5 and the remainder at R6. That is why we clear R5 before we divide.

MOV R6,@ANS

MOVe the contents of R6 to what's at the label ANS.

SLA R6,8

Shift Left Arithmetic. Shift the contents of R6 left 8 bits (1 byte) to the MSB. Fills the shifted out positions with 0.

MOVB R6,@ANS

MOVe Byte moves the Most Significant Byte (MSB) or leftmost to the word at ANS without disturbing the LSB of ANS.

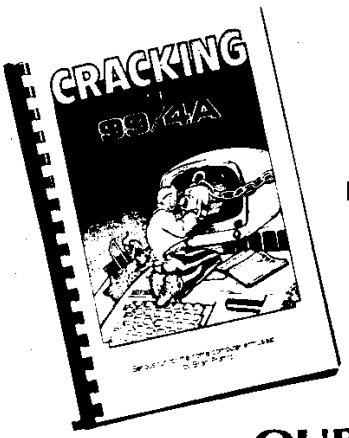
Logic for display on the screen routine. R0 contains the position on the screen to display the answer. Found by SCREEN ADDRESS = ((ROW-1)*32) + (COLUMN-1). In this case 366. R1 contains the address of the beginning of the data to write to the screen. In this case R1 contains the address of ANS. R2 contains the number of bytes to write beginning at the VDP address in R0 and the CPU address in R1.

JMP $

Instructs the computer to JuMP to the current location of the program counter. Same as 100 GOTO 100. This locks up the computer so you may see the result. If you want to see how quickly the computer executes place an * in column 1 in front of this instruction and reassemble.

(Please turn to Page 30)

* PRE PUBLICATION OFFER *



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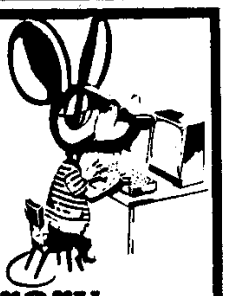

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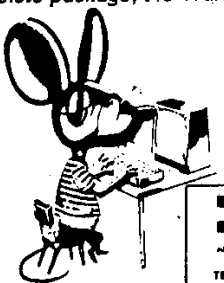

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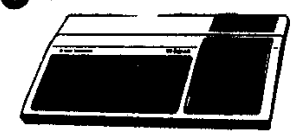

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HOW TO ASSEMBLE—

(Continued from Page 26)

Logic for the Return to the Calling Routine. Clears the GPL status byte at >837C. Much more on this important byte later. Loads the workspace pointer back to the GPL workspace and branches to the routine at >0070. END is a directive to inform the assembler there are no more instructions.

HOW TO ASSEMBLE

If you have the Ralph Molesworth book *Introduction to Assembly Language for the TI Home Computer* (Steve Davis Publishing, P.O. Box 190831, Dallas, TX 75219) refer to page 42, or pages 30-36 in the Editor/Assembler manual. Here's a brief step by step:

1. Select EDITOR/ASSEMBLER from the main menu. Place your editor assembler disk A in drive 1.
2. Select 1-EDIT from the E/A menu.
3. Select 2-EDIT from the EDIT menu.
4. Enter your program just as shown. You may omit any comments if you desire.
5. Press FCTN ESCAPE twice to return to the EDIT title screen.
6. Select 3-SAVE. Answer Y to the VAR/80 prompt. Enter your source file name such as DSK2.SOURCE. If you only have one drive place another disk in drive one first and use DSK1 instead of DSK2.
7. Press FCTN ESCAPE to return to E/A title screen.
8. Select 2-ASSEMBLE. Answer Y to the load assembler question. Insure the E/A disk A is in drive 1.
9. At the SOURCE FILE NAME enter the same file name you used in 6 above. ie. DSK2.SOURCE, press enter.
10. At the OBJECT FILE NAME enter DSK2.OBJECT and press enter.
11. Press enter at the LIST FILE NAME. More on this feature next time.
12. At the OPTIONS prompt enter R. Press enter. R means you used R in front of your register numbers in the source code. You may also enter CLST. C is compressed object code (will not load from X/B loader). L is a source listing if you entered a LIST FILE NAME at the prompt. S prints the symbols and registers used in the program on your source list. T prints the full text string in your source listing. More on these features later. Assembler executing will appear followed-by 0000 errors (you hope). Press enter.
13. Press 3-LOAD AND RUN.
14. At the FILE NAME prompt enter your OBJECT file name ie. DSK2.OBJECT. Press enter. Press enter again to get to the PROGRAM NAME prompt.
15. This is the name we DEF in our program in this case START.
16. Your program will execute.

SUMMARY

I realize this has been long but there has been much to cover to get started. Don't get discouraged. We'll go at this together. I strongly recommend you study these references in your Editor-Assembler manual and experiment on your own. Until next time, "ASSEMBLER EXECUTING".

STUDY GUIDE

Page 20-36 Using the Editor-Assembler Cartridge.
Page 39 Sec 3.1 Registers.
Page 46-48 Source Statement Format.
Page 53 Predefined Symbols. ($).
Page 57-62 Sec 4.1.1, 4.1.4; 4.2, 4.4 Addressing.
Page 80 Add Instruction.
Page 85 Add Immediate.
Page 88 Divide.
Page 90 Increment.
Page 107 Branch.
Page 115 Jump Less Than or Equal.
Page 143 Compare Immediate.
Page 163 Load Immediate.
Page 165 Load Workspace Pointer Immediate.
Page 166 Move Word.
Page 168 Move Byte.
Page 20 Shift Left Arithmetic.
Page 212 Block Starting Symbol.
Page 225 Data.
Page 227 DEF.
Page 228 REF.
Page 248 VSBW, VMBW.
Page 329-330 Graphics Mode Tables.
Page 394-396 Numbering Systems.
Page 428-429 ASCII character set.
Page 442 Other Returns.

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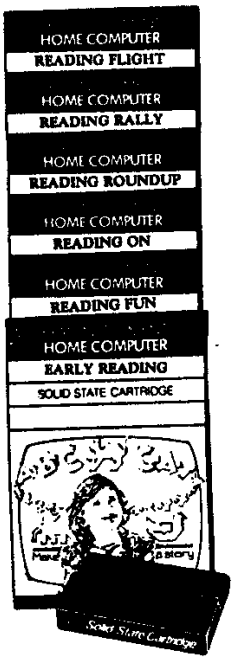

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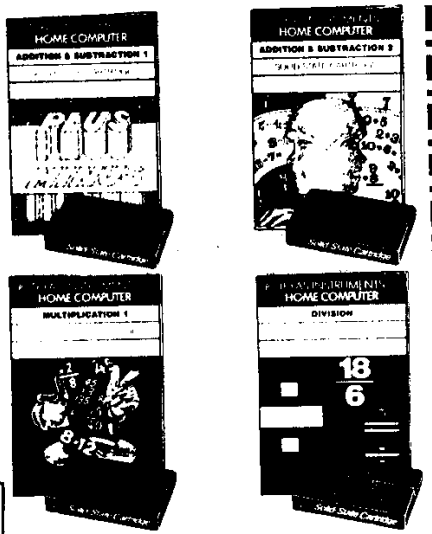

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Computer Aided Design

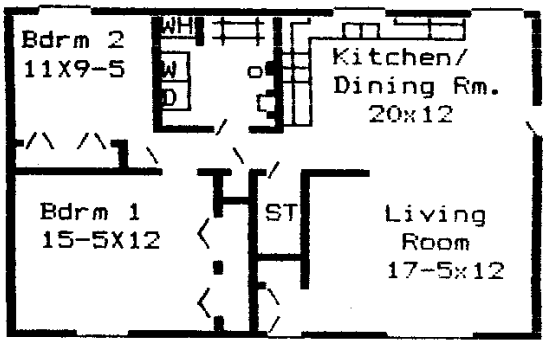

Fig. 1—Computer aided floor plan design incorporating graphic symbols and upper and lowercase alphanumerics.

By SUSANNE L. JOHNSTON

Computer Aided Design (CAD) is a hot topic in the computer industry. The computer takes the drudgery out of the design process by handling erasures and modifications with the press of a key. Now, using your TI 99/4A you can develop two-dimensional designs including floor plans, landscape designs, business logos and letterheads.

Designs are created with block graphic symbols using several TI BASIC graphic subprograms. Each symbol is defined using the CHAR graphic subprogram, and assigned to a keyboard CONTROL character (enter a character key and the CONTROL key simultaneously). The cursor is moved with the arrow keys; FUNCTION E (up), FUNCTION S (left), FUNCTION D (right) and FUNCTION X (down). The space bar displays a blank on the screen. When a character is displayed the cursor does not move to the right as in normal typing mode. In addition to graphic symbols, all keyboard characters may be used. Table 1 indicates the keys used and graphic symbol displayed by each.

Figure 1 is a floor plan developed with Computer Aided Design, using graphic symbols and alphanumerics.

The heart of the program is in lines 990 to 1070. Using subprogram KEY, a keyboard character is passed to the program and then printed with subprogram HCHAR. The cursor may be moved left, right, up or down with the arrow keys. Before we can see exactly

(Please turn to Page 36)

CONTROL	Q	W	E	R	T	Y	U	I	O	P
Graphic Symbol	▛	▀	▜	▌	▐	┌	─	┐	┬	┴
Graphic Symbol	▙	▄	▟	▆	+	└	│	┘	├	┤
CONTROL	A	S	D	F	G	H	J	K	L	;

Table 1—Keyboard characters corresponding to graphic symbols displayed on screen. The CTRL key must be depressed with the keyboard character to display graphic symbols.

PROGRAM DESIGN

The program uses TI graphic subprograms SCREEN, COLOR, CHAR, KEY, GCHAR, HCHAR and CLEAR. A brief overview of the program structure is shown in Table 2.

Line Numbers	Function and Subroutine
100-260	Select and set screen and character colors using subprograms SCREEN and COLOR
270-420	Determine system hardware configuration
430-460	Define alphanumeric symbols for hard copy
470-670	Redefine block graphic symbols for hard copy
680-880	Define graphic characters for display using subprogram CHAR
890-980	Load previously developed design from disk using subprogram HCHAR
990-1070	Display design using subprograms KEY, GCHAR and HCHAR
1080-1280	Check for arrow key to move cursor
1290-1350	Check keyboard entry for save design, print design or both, using subprogram HCHAR
1360-1480	Save design on disk
1490-1580	Print design on Gemini with 12 lines/inch, unidirectional and emphasized modes, using subprogram GCHAR
1590-1600	Reset printer to power on condition
1600-1670	Print filename the design is stored under and end program

Table 2—Overview of program CAD and TI graphic subprograms used in each section.

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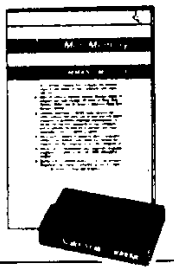

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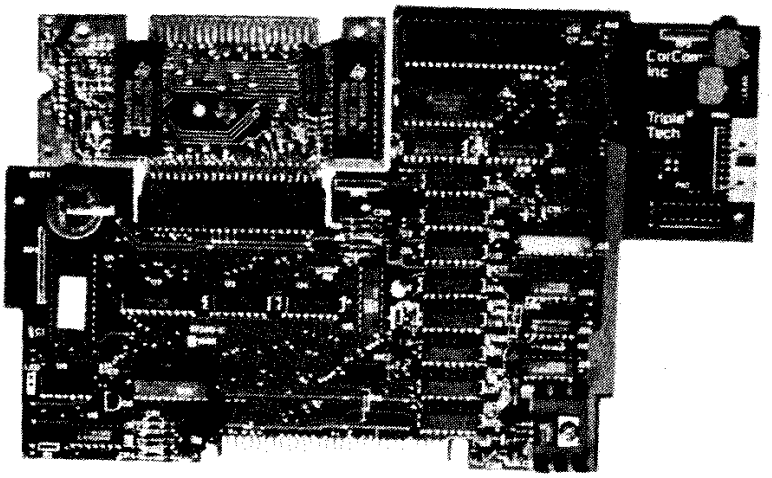
Triple Tech being sent



Triple Tech by CorComp, now being shipped to users, is the first TI expansion card that is ready to run immediately with "no worries about system compatability," according to Jackirae Sagouspe, CorComp president.

She notes that the Triple Tech is the first 99/4A expansion card not to have a clamshell but to plug directly into the expansion box, similarly to peripheral cards made for other computers such as IBM and Apple.

The card's functions are a real-time clock/calendar, 64K parallel printer buffer and port for the TI speech synthesizer board.

The clock/calendar provides a way to time and date documents with year, month, date, day, hour, minute and second. It is accessible through TI BASIC or Extended BASIC by using OPEN, PRINT, INPUT and CLOSE statements.

With the 64K parallel printer buffer, the computer is freed up five seconds after a page is sent to the printer, as compared to about 40 seconds using TI-Writer, according to Sagouspe.

Sagouspe said production was scheduled to begin on CorComp's 83 Module Adapter the last week in September. With this product, Atari 99 and other third party software will run on 1983 consoles for the TI99/4A, similarly as with Navarone's GROM Buster, she said.

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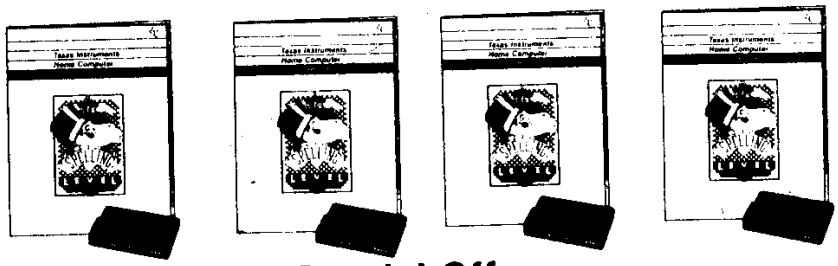

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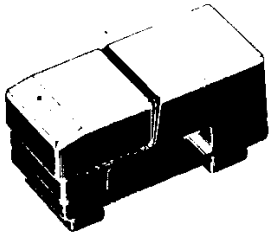

The above 4 modules are designed to work with the TI Speech Synthesizer so that all lesson words are pronounced.

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COMPUTER AIDED DESIGN—

(Continued from Page 32)

how the program works, we must understand definition of the graphic characters.

Subprogram CHAR is used to define graphic characters for display. Each symbol is defined to the computer in an eight by eight matrix where each row is divided into two groups of four dots each. Within each four dot section, each dot may be either turned on or off. A different hexadecimal digit is assigned to each possible combination of on and off for the four dots. The codes may be found in the TI User's Reference Guide. Consider the left corner symbol ▙. An enlarged matrix representation of ▙ appears in Figure 2.

The first four dots in row one are on, for a hexadecimal digit of F; the second four dots are off for a digit of 0. To use subprogram CHAR first choose ASCII codes that are not being used for other symbols, in this case 129 through 153. Assign a graphic character to each code using the appropriate hexadecimal digits. The hexadecimal representation for ▙ is F0F0F0F0FFFFFFFF.

Let's follow a single symbol ▙ through the program. CONTROL Q was chosen as the keyboard character to display ▙, and the ASCII code for CONTROL Q is 129. The printer compatible code for ▙ is 237. The printer code for XXX is assigned to location 129 in the vector GRAPHIC in line 480.

480 GRAPHIC(129)=237.

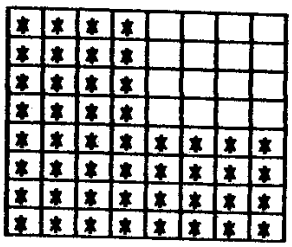
CONTROL Q (129) is assigned the hexadecimal representation for the left corner in line 750.

750 CALL CHAR(129,'F0F0F0F0FFFFFFFF')

The computer will now display a ▙ when CONTROL Q is pressed. The printer will also print a ▙ when GRAPHIC (129) is sent. We now have capability to both display and print a given symbol. Let's assume we are starting a new design and look to the heart of the program. The cursor is flashing

(Please turn to Page 40)

Matrix On/Off Positions



Hex Code

F 0
F 0
F 0
F 0
F F
F F
F F
F F

Fig. 2—Matrix representation and hexadecimal code for ▙.

Computer Aided Design program

```
100 REM          ----- CAD ---
 COMPUTER AIDED DESIGN JULY
1, 1985, S. L. JOHNSTON
110 OPEN #1:"PIO"
120 DIM GRAPHIC(160)
130 CALL CLEAR
140 PRINT "SELECT COLORS"
150 PRINT
160 PRINT "CHOOSE COLOR CODE
S FROM 1 TO 16"
170 PRINT
180 INPUT "SCREEN COLOR?  ":
S
190 PRINT
200 INPUT "CHARACTER COLOR?
 ":F
210 REM          ------------
---------------- SET SCRE
EN AND CHARACTER COLORS
220 CALL SCREEN(S)
230 FOR C=1 TO 16
240 CALL COLOR(C,F,S)
250 NEXT C
260 CALL CLEAR
270 REM          ------------
---------------- DETERMINE
 HARDWARE CONFIGURATION
280 PRINT "HARDWARE CONFIGUR
ATION"
290 PRINT
300 PRINT "ENTER YES OR NO"
310 PRINT
320 INPUT "DO YOU HAVE A DIS
K DRIVE?    ":DRIVE$
330 PRINT
340 IF DRIVE$="YES" THEN 360
350 IF DRIVE$="NO" THEN 410
360 INPUT "FILENAME? (DSK1.f
name)  ":LABEL$
370 OPEN #2:LABEL$,INTERNAL,
FIXED 216
380 PRINT
390 INPUT "LOADING DESIGN FR
OM DISK?  ":START$
400 PRINT
410 INPUT "DO YOU HAVE A GEM
INI PRINTER?  ":PRINTER$
420 CALL CLEAR
430 REM          ------------
--------  DEFINE ALPHANUMERI
C SYMBOLS FOR HARD COPY
440 FOR J=1 TO 160
450 GRAPHIC(J)=J
460 NEXT J
470 REM          ------------
-----  REDEFINE BLOCK GRAPHI
C SYMBOLS FOR HARD COPY
480 GRAPHIC(129)=237
490 GRAPHIC(132)=238
500 GRAPHIC(134)=239
510 GRAPHIC(135)=250
520 GRAPHIC(136)=246
530 GRAPHIC(138)=245
540 GRAPHIC(139)=247
550 GRAPHIC(140)=244
560 GRAPHIC(147)=232
570 GRAPHIC(156)=249
580 GRAPHIC(133)=236
590 GRAPHIC(137)=242
600 GRAPHIC(143)=243
610 GRAPHIC(144)=248
620 GRAPHIC(145)=235
630 GRAPHIC(146)=233
640 GRAPHIC(148)=234
650 GRAPHIC(149)=241
660 GRAPHIC(151)=231
670 GRAPHIC(153)=240
680 REM          ------------
----------------------  DE
FINE GRAPHIC CHARACTERS
690 CALL CHAR(151,"FFFFFFFF0
0000000")
700 CALL CHAR(147,"00000000F
```

(Please turn to Page 38)

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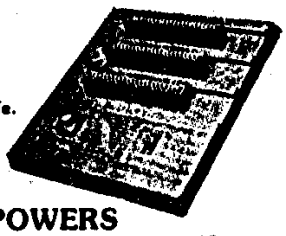

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COMPUTER AIDED DESIGN—

(Continued from Page 36)

```
FFFFFFF")
710 CALL CHAR(146,"F0F0F0F0F
0F0F0F0")
720 CALL CHAR(148,"0F0F0F0F0
F0F0F0F")
730 CALL CHAR(145,"FFFFFFFFF
0F0F0F0")
740 CALL CHAR(133,"FFFFFFFF0
F0F0F0F")
750 CALL CHAR(129,"F0F0F0F0F
FFFFFFF")
760 CALL CHAR(132,"0F0F0F0FF
FFFFFFF")
770 CALL CHAR(134,"FFFFFFFFF
FFFFFFF")
780 CALL CHAR(153,"0000000F0
8080808")
790 CALL CHAR(149,"000000FF0
0000000")
800 CALL CHAR(137,"000000F80
8080808")
810 CALL CHAR(143,"000000FF0
8080808")
820 CALL CHAR(140,"0808080F0
8080808")
830 CALL CHAR(138,"080808080
8080808")
840 CALL CHAR(136,"0808080F0
0000000")
850 CALL CHAR(139,"080808F80
0000000")
860 CALL CHAR(144,"080808FF0
0000000")
870 CALL CHAR(156,"080808F80
8080808")
880 CALL CHAR(135,"080808FF0
8080808")
890 REM          ------------
------- LOAD PREVIOUSLY DEV
ELOPED DESIGN FROM DISK
900 IF DRIVE$="NO" THEN 1000
910 IF START$="YES" THEN 930
920 IF START$="NO" THEN 1000
930 FOR COL=1 TO 32
940 FOR ROW=1 TO 24
950 INPUT #2:A,
960 CALL HCHAR(ROW,COL,A,1)
970 NEXT ROW
980 NEXT COL
990 REM          ------------
------------------------------
--------  DISPLAY DESIGN
1000 R=12
1010 C=16
1020 CURSOR=43
1030 CALL KEY(5,KEY,STATUS)
1040 CALL GCHAR(R,C,A)
1050 CALL HCHAR(R,C,CURSOR,1
)
1060 CALL HCHAR(R,C,A,1)
1070 IF STATUS=0 THEN 1030
1080 REM          ------------
------------------------------
--  CHECK FOR ARROW KEY
1090 IF KEY<>11 THEN 1140
1100 R=R-1
1110 IF R<>0 THEN 1030 ELSE
1120
1120 R=1
1130 GOTO 1030
```

(Please turn to Page 40)

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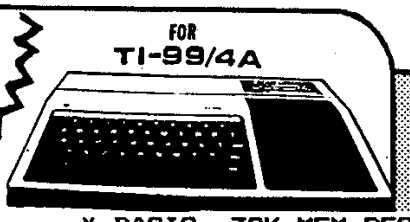

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Extended BASIC II Plus released

A West German company has released an upgraded version of TI Extended BASIC that provides some 20 additional statements and about 40 graphics commands. Called Extended BASIC II Plus, the program is marketed by Mechatronic GmbH.

The cartridge is produced under licenses from Texas Instruments and Apesoft. Included is TI's Extended BASIC plus Apesoft's high resolution graphic BASIC. Apesoft is based in Austria.

Other TI99/4A products marketed by Mechatronic are standard Extended BASIC, a mouse, 128K card a low-cost disk system with controller ($199) and an EPROMer capable of handling memory chips of up to 128 kilobytes.

A review of the cartridge appears elsewhere in this issue.

Mechatronic also plans to announce two more products for the 99/4A before year's end, according to company official Manfred Wilhelm. The nature of these products is not known at this time.

Suggested retail price for Extended BASIC II Plus is $98.

The cartridge appears to offer many of the features promised by Myarc Inc. in its Extended BASIC upgrade, particularly those involving graphics commands. Among the graphics commands, which are accessed via CALL LINK statements, are SETCOL, SETTO, MOVE, TURN, TURNTO, ARCUS, CIRCLE, ELLIPS, AXIS, DSPLAY, GSAVE, GLOAD and BHCOPY. The extended statement set includes BHCOPY, which is a high resolution screen dump, VPEEK, VPOKE, GPEEK, WAIT, MOVE, MSAVE, MLOAD, QUITOF, QUITON, SPROF, SPRON and FIND.

Mechatronic also plans an October release of an English version of TI99 Intern, a manual that the company says deals with Graphics Programming Language and other items of interest.

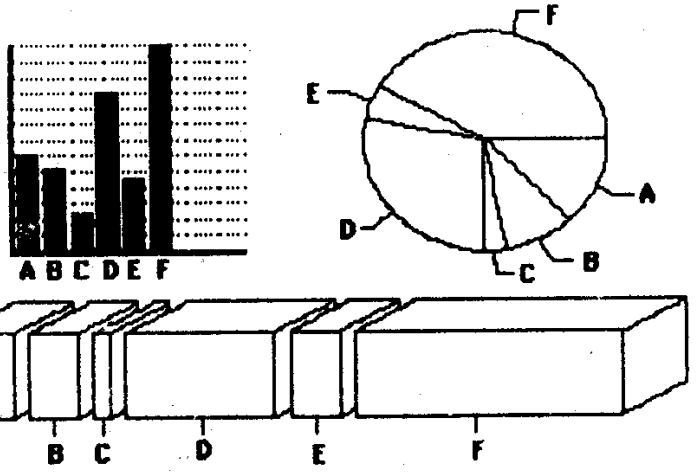
Mechatronic GmbH can be reached at Dresdener StraBe 21, D 7032 Sindelfingen, West Germany.

Discount is 80%

User groups who have representatives on DataBioTics' national advisory panel will receive an 80 percent discount on programs for the firm, not a 20 percent discount as reported in the September MICROpendium, according to Bill Moseid of DataBioTics.

Moseid said a user group can order two copies of each product at 20 percent of the retail cost, one for the user group library and one for the representative.

EXTENDED BUSINESS
GRAPHS!



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Howell, MI 48843

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COMPUTER AIDED DESIGN—

(Continued from Page 38)

```
1140 IF KEY<>10 THEN 1190
1150 R=R+1
1160 IF R<>25 THEN 1030 ELSE
 1170
1170 R=24
1180 GOTO 1030
1190 IF KEY<>8 THEN 1240
1200 C=C-1
1210 IF C<>0 THEN 1030 ELSE
1220
1220 C=1
1230 GOTO 1030
1240 IF KEY<>9 THEN 1300
1250 C=C+1
1260 IF C<>33 THEN 1030 ELSE
 1270
1270 C=32
1280 GOTO 1030
1290 REM        -------------
------------------- CHECK
FOR SAVE, PRINT OR BOTH
1300 IF KEY=1 THEN 1370
1310 IF PRINTER$="NO" THEN 1
340
1320 IF KEY=6 THEN 1510
1330 IF KEY=15 THEN 1370
1340 CALL HCHAR(R,C,KEY,1)
1350 GOTO 1030
1360 REM        -------------
-----------------------------
--  SAVE DESIGN ON DISK
1370 IF DRIVE$="NO" THEN 134
0
1380 RESTORE #2
1390 FOR COL=1 TO 32
1400 FOR ROW=1 TO 24
1410 CALL GCHAR(ROW,COL,A)
1420 PRINT #2:A,
1430 NEXT ROW
1440 PRINT #2:
1450 NEXT COL
1460 CLOSE #2
1470 IF KEY=15 THEN 1510
1480 END
1490 REM        -------------
-------------------------
 PRINT DESIGN ON GEMINI
1500 REM        -----------
12 LINES/INCH, UNIDIRECTIONA
L MODE, EMPHASIZED MODE
1510 PRINT #1;CHR$(27);CHR$(
65);CHR$(6);CHR$(27);CHR$(85
);CHR$(1);CHR$(27);CHR$(69);
1520 FOR ROW=1 TO 24
1530 FOR COL=1 TO 32
1540 CALL GCHAR(ROW,COL,A)
1550 PRINT #1:CHR$(GRAPHIC(A
));
1560 NEXT COL
1570 PRINT #1
1580 NEXT ROW
1590 REM        -------------
-------------  RESET PRINTE
R TO POWER ON CONDITION
1600 PRINT #1:CHR$(27);CHR$(
64);
1610 REM        -------------
------------  PRINT FILENAME
 DESIGN IS STORED UNDER
1620 FOR I=1 TO 5
1630 PRINT #1
1640 NEXT I
1650 IF DRIVE$="NO" THEN 167
0 ELSE 1660
1660 PRINT #1:"STORED UNDER
FILENAME ";LABEL$
1670 END
```

DESIGN—

(Continued from Page 36)

in the center of the screen in front of you and you press CONTROL Q. A ▙ is stored in memory at the cursor location. The cursor is printed and then ▙_ is printed so that the cursor and ▙ are alternately flashing on the screen. Additional characters may be entered as you move around the design space with the arrow keys until the design is complete.

Upon completion you may want to save or print the design. To save, enter FUNCTION 7, to print with a Gemini Star Micronix printer, enter FUNCTION 8 or to save and print, enter FUNCTION 9. Built in safeguards will ignore the FUNCTION 7, 8 and 9 keys if you do not have a printer or disk drive.

Limitations of TI BASIC restrict the design space to 24 rows and 32 columns. Use of a television rather than a monitor may further restrict the design space by cutting off columns one, two, 31 and 32. To maximize visibility it may be necessary to use only columns three to 30.

Ramsoft ships RAMLABEL

Ramsoft Enterprises has begun shipping a new program, RAMLABEL, for the TI99/4A, at a suggested list price of $9.95.

Ramon Martinez of Ramsoft notes that the program is the company's second program released for less than $10, TC-MAIL being the first.

He says RAMLABEL will allow the user to custom design a label, with the ability to design a font, pitch, darkness and tab setting for each line. The user may then type in the text and from there, the computer will print out as many labels as desired, Martinez says. Martinez explains that the user designs the labels by selecting from assembly pulldown menus.

Martinez says RAMLABEL will store up to three formats for easy recall. The user may optionally store text with the format.

According to Martinez, RAMLABEL supports pica, elite and condensed pitch, regular, italic and "near letter quality" fonts; and double strike and emphasized impressions. He says all printing capabilities are available for printers that support these options. He says RAMLABEL includes a setup program to allow the user to configure his system's printer capabilities to the program. Martinez says RAMLABEL also supports block graphics through a transliterate type command that will allow a user to create lines of block graphics or text on the labels.

Martinez says RAMLABEL will also let the user define tabbing for each line. The user can align left, align right, auto center or set a specific tab stop for each line, Martinez says.

RAMLABEL requires 48K, single disk drive, printer and interface and Extended BASIC. RAMLABEL is available from dealers or can be ordered directly from Ramsoft at list price plus $1.50 shipping and handling.

For further information, contact Ramsoft Enterprises, 1501 East Chapman Avenue, Suite 338, Fullerton CA 92631.

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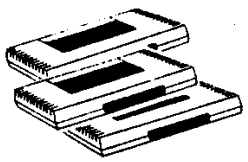

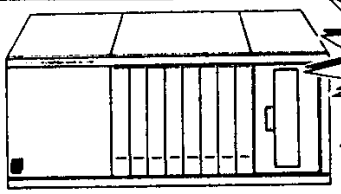

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4A/TALK

Emulator that rings the bell

By SCOTT DARLING

As a SysOp of a TI-based BBS, I am always looking for a good terminal emulator program. And I have found almost the BEST! 4A/TALK from DataBioTics has *almost* everything you would ever want. It has an ASCII buffer, TEII file transfers and XMODEM protocol. And all of these are loaded at once for easy access at any time. It also has an online disk cataloger and a delete file option. This allows you to check your disks online and alter them without having to load another program.

The version I had for testing will load from Editor/Assembler, Mini-Memory, or Extended BASIC. The latest version will also load from TI-Writer or TK-Writer.

Included on the disk is a file for automatic system configuration upon power-up. This can be written using a Display/Variable 80 editor (such as TI-Writer) or from a BASIC program.

Next is a file for auto-dialing that utilizes a *smart* modem. You can set up a directory listing and choose which number to dial. It will utilize all of the commands allowed by your particular modem, because to set up the file you tell the auto-dialer program what codes to use for busy, redial and so forth.

Performance: I tried my best to make every irrational response at each menu I could think of, but 4A/TALK would not let me crash it. At every menu there is a keystroke to allow you to back out of any command. And a CTRL X will conveniently abort any function mode.

4A/TALK uses three types of transfer protocols: ASCII, TEII and XMODEM. All three use an 8K buffer for storage. This concept is great for TEII and XMODEM but in ASCII it fills up rather fast. However, there is a screen bar graph that shows how much room you have left and you can toggle the buffer on and off. To utilize TEII you will have to find the correct settings to activate this mode. On my system it is 7 bit, no parity, 1 stop bit. This may vary from system to system. Once you have the correct settings the program automatically kicks into TEII downloading and displays a counter similar to the counter displayed when using the TEII cartridge. Activating the upload function requires a keystroke from command mode. For XMODEM there is a menu for uploading and downloading. Remember I said that these modes use an 8K buffer so they are a little faster and a little easier on the drives than many other terminal emulators. There is also a "bell" that sounds when the file transfers are complete.

(4A/TALK does not support text scrolling, so the only way to refer back to data is to dump it to a printer or to a disk for later recall. Ed)

Ease of Use: This is an easy assembly language program to load and run. After loading the program it gives you a title screen then loads the configure file. If you don't need to make any corrections to the file just hit enter at each prompt. And if you made an error on a previous line you can back up to it and make the neccessary corrections. After

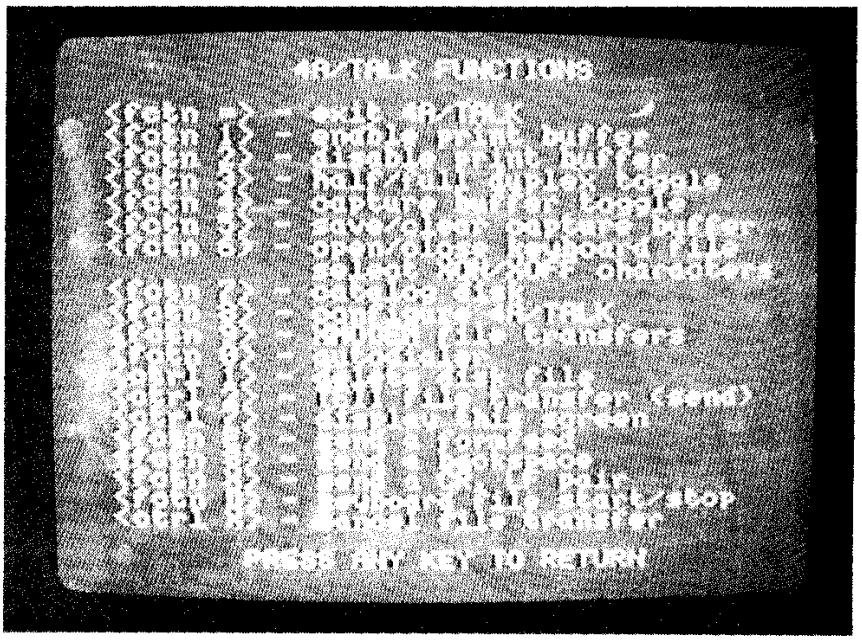
(Please turn to Page 48)

Review

Report Card

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

Cost: $19.95 (disk)
Manufacturer: DataBioTics, P.O. Box 1194, Palos Verde Estates, CA 90274
Requirements: TI 99/4A console, RS232 interface, modem, 32K memory, disk system, monitor or TV, and one of following cartridges: Editor/Assembler, Extended BASIC, Mini-Memory Module or TI-Writer (printer is optional)



DataBioTics

MINIWRITER I, II, AND III

MINIWRITER is a Word Processor available in three (3) different options.

You are able to imbed printer control commands direct from the keyboard to make the printer do whatever you desire. MINIWRITER uses the same formatting as TI-Writer and displays the codes on the screen. Version III is available in a cartridge and requires only a console and optional printer and cable.

This is an excellent choice for anyone desiring a printer without investing in an expansion system.

Version II includes all the features of III without the parallel printer interface.

Version I on cassette is a low cost yet powerful word processor for use with Mini-Memory.

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MINIWRITER III - $99.95	Order #DBMOM3

PILOT *

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Product available 4th Quarter, 1985. Order #DBDOPI

Suggested Retail Price - $24.95

SUPERDISK

A RAM Disk for the 99/4A, SUPERDISK contains Assembly, Basic, and X-Basic utilities operating faster than hard disks. Additional routines included are peek/poke, memory move, write VDP, call catalog, screen dump, and sort files. SUPERDISK is a PE box card at 256K, expandable to 512K. The latest advanced technology to afford the ability to place 512K on a 5" by 7" card.

Product available 4th Quarter, 1985. Order #DBPOSD

Suggested Retail Price - $299.00

4A / TALK *

A Terminal Emulator program with an operating range of 300 to 9600 Baud, 4A/TALK supports three file transfer methods. (1) Manual transfer using the capture buffer and "keyboard" files which will transfer text to any other system. (2) XMODEM file transfer protocol. (3) The Terminal Emulator II mode. There is a built-in Disk Directory and Auto-Dialer function.

You will need either the Editor/Assembler, Mini-Memory, Extended Basic module or a CorComp Disk Controller Card.

Product available immediately. Order #DBDOTA.

Suggested Retail Price - $19.95

BITMAC *

BITMAC is a comprehensive bit-mapped graphics program for the TI-99/4A computer.

Product available immediately. Order #DBDOBI.

Suggested Retail Price - $39.95

RENOIR

A module which contains the FORTH language with a Graphic Generation Package. The module contains 64K of memory and a menu driven choice of either Forth or Renoir. Renoir has the ability to save graphics to any desired device.

Product available 4th Quarter, 1985. Order #DBMORE.

Suggested Retail Price - $99.95

*4A/TALK, PILOT and BITMAC equipment requirements include at least one disk drive system, 32K memory expansion, RS-232 card, and a modem (modem for 4A/TALK only).

DISK MASTER I

DISK MASTER I is a powerful new program that can be loaded from BASIC, Extended BASIC, MINI MEMORY, ED/ASM, TI WRITER using the TI, CorComp or MYARC disk controller cards. DISK MASTER I provides features similar to the CorComp Disk Manager, plus even greater power. With full screen editing, Configure Master and the ability to activate all file utilities at the same time, this program is a major advance in computing power.

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Extended BASIC II Plus

Upgrade hails from Germany

By JOHN KOLOEN

Extended BASIC II Plus is the first upgrade to TI's Extended BASIC to hit the market, and it had to travel a long way to get here, from West Germany no less. This cartridge includes TI's complete Extended BASIC program but an additional 8 kilobytes of programming statements that will be of use to programmers and those who enjoy using graphics.

A number of the statements included in this cartridge are available in some form elsewhere. For example, CorComp's disk manager includes an assortment of 'toolshed' utilities such as VPEEK and VPOKE. These, however, are accessible only through the use of CorComp's disk controller. Likewise, there are a number of assembly language routines that provide some graphics functions similar to those supported in this cartridge, but none is as easily accessible. Nor am I aware of any collection of such routines that provide the breadth of graphics control offered by XBII+.

Performance: Extended BASIC II Plus appears to be completely compatible with TI's Extended BASIC. I found no Extended BASIC program that did not run perfectly through this cartridge. (The only anomaly I could detect involves the use of the Widget cartridge expander manufactured by Navarone Inc. When the XBII+ was plugged in, none of the other two cartridges could be accessed.)

XBII+ appears to be fully compatible with the CorComp and TI disk controller cards, the Foundation Computing 128K card and the Myarc 32/128K card.

XBII+ does not offer enhancements to TI's Extended BASIC. It does not appear to run faster nor slower than the standard Extended BASIC. Rather, it provides an extended set of statements that can be used to gain greater control over the computer than is possible through Extended BASIC.

The cartridge provides two sets of features: an extended statement set and a series of high resolution graphics statements. There are some 20 new programming statements and 40 graphics-oriented statements.

Review

Report Card

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

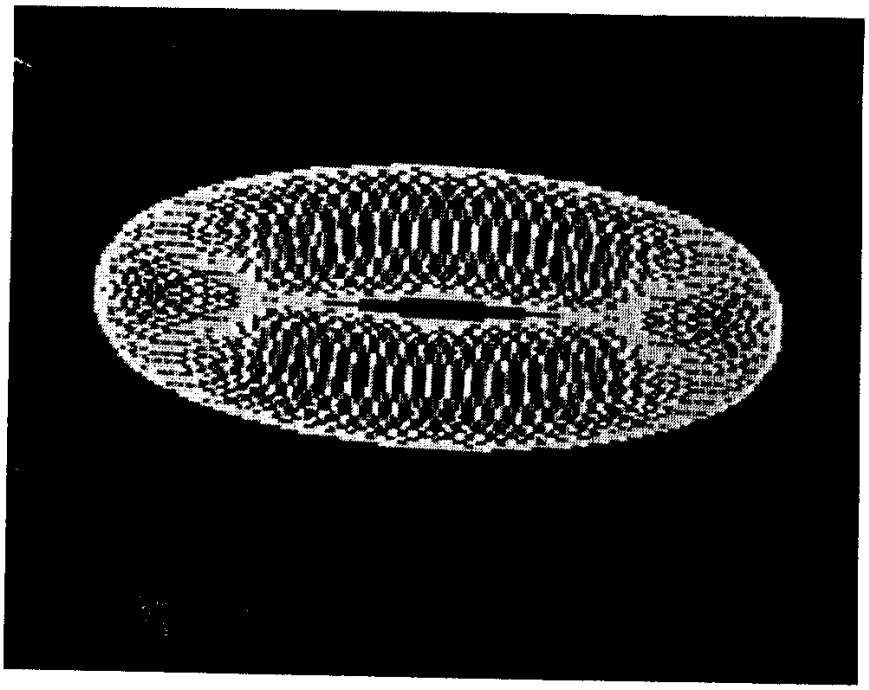
Cost: $98
Manufacturer: Mechatronic GmbH, Dresdener StraBe 21, D 7032 Sindelfingen, West Germany
Requirements: console and monitor or television, expansion memory and disk system recommended, printer optional

The extended statement set includes the following: BHCOPY, VPEEK, VPOKE, GPEEK, ALLSET, WAIT, MOVE, MSAVE, MLOAD, BYE, NEW, RESTORE, QUITON, QUITOF, SPROF, SPRON, SCREENOF, SCREENON and FIND. (See Fig. 1 for definitions.)

Graphics statements include: APESOFT, CLRAPE, GRAFIC, BYEBYE, WINDOW, SETBLE, CLTBLE, TABLE, SETCOL, INVERT, CLSCRN, CENTRE, SETTO, RESET, IFSET, MOVE, REMOVE, MOVETO, REMVTO, TURN, TURNTO, RECT, CLRECT, CIRCLE, CLCRCL, ARCUS, CLARCS, ELLIPS, CLLIPS, VALUES, AXIS, HSTDIA, CRCDIA, WRITE, DSPLAY, ACCEPT, SHIFT, GSAVE, GLOAD and BHCOPY.

To demonstrate the power of some of these commands, examine the program in Figure 2. A printout of the graphic produced, a torus, is pictured above it. (A photo of the screen

(Please turn to Page 45)



XBASICII+—

(Continued from Page 44)

display is shown below.) Line number 190 is not needed to produce the torus. Its only function is to send it to the printer. The program is one of many used to illustrate use of the statements in the English version of the XBII+ manual.

As indicated above, some of the extended programming statements are available elsewhere as assembly language subroutines. CALL LOADs used to disable the QUIT key and

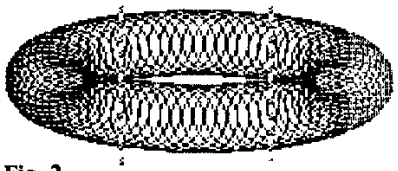


Fig. 2.

```
100 POPT$="PIO"
110 CALL LINK("GRAFIC",0)
120 CALL LINK("SETBLE",24)
130 CALL LINK("WINDOW",1,1)
140 CALL LINK("CENTRE",96,40)
150 PIARC=4*ATN(1)
160 FOR PHI=0 TO 2*PIARC STEP
PIARC/40
170 CALL LINK("CIRCLE",66*SIN(
PHI),20*COS(PHI),17)
180 NEXT PHI
190 CALL BHCOPY(POPT$,"K")
```

sprites have been published in MICROpendium. Although some of the statements BYE and NEW, for example appear to be redundant, they aren't. These statements can be used in programs to perform the same functions as the Extended BASIC commands of the same name. (The commands, of course, cannot be used in programs.)

I found the BHCOPY statement to be extremely useful. This one line screen dump command is easy to incorporate into a program and very effective at dumping text or graphics.

While some of the extended programming statements will be useful only to sophisticated programmers, most of the graphics statements seem ac-

(Please turn to Page 48)

Fig. 1 EXTENDED STATEMENT SET

The following subroutines are accessed via CALL statements.

BHCOPY—generates hardcopy of the screen on printer in BIT IMAGE MODE.

VPEEK—allows direct access to memory addresses in VDP RAM.

VPOKE—permits writing directly to addresses in VDP RAM.

GPEEK—allows reading of addresses in GROM. Function corresponds to CALL PEEK.

ALLSET—resets characters with ASCII codes 32-126 to initial definitions.

WAIT—results in delay with duration determined by user.

MOVE—used to move contents of memory blocks within RAM. Modes include: Source VDP RAM, drain VDP RAM; source VDP RAM, drain CPU RAM; source CPU RAM, drain VDP RAM; source CPU RAM, drain CPU RAM.

MSAVE—saves segments of CPU RAM in program format to an external device.

MLOAD—loads program files into CPU RAM that have been saved with CALL MSAVE.

BYE—has same function as command BYE but can be used in programs.

NEW—has same function as command NEW but can be used in programs.

RESTORE—prepares computer for next data statement. The Extended BASIC RESTORE can use only numeric value.

QUITOF/QUITON—QUITOF disables function of QUIT (FCTN +) key. QUITON reactivates QUIT function.

SPROF/SPRON—SPROF disables motion sprites. SPRON reactivates motion of sprites following CALL MOTION or CALL SPRITE statement.

SCREENOF/SCREENON—SCREENOF disables the data transfer between VDP RAM and the display screen. SCREENON reactivates the display.

FIND—used to examine one dimensional string array for a string defined by user.

GRAPHIC STATEMENTS

The following graphics statements are accessed through use of CALL LINK.

APESOFT—command used to transfer the high resolution statement set into expansion memory.

CLRAPE—restores initial condition of computer as if Extended BASIC had just been accessed. Operates CALL INIT, resets VDP RAM, closes all opened files and executes NEW.

GRAPHIC--accesses graphics mode by initializing registers, defining a graphics table consisting of 15,360 pixels.

BYEBYE—used to exit graphics mode and return to standard Extended BASIC.

WINDOW—used to transmit sections of graphics table or the complete graphics table to the screen.

SETBLE—used to set height and width dimensions of the graphics table.

CLTBLEL—erases the graphics table and the graphic.

TABLE—returns the current parameters of the graphics table.

SETCOL—defines foreground and background colors.

INVERT—swaps foreground and background colors of the graphic.

CLSCRN—similar to CALL CLEAR. Erases the graphic.

CENTRE—defines the system of user coordinates (X and Y).

SETTO—sets pixels at the X and Y coordinates.

RESET—deletes pixels with the given coordinates of X, Y.

(Please turn to Page 48)

XB Detective

This sleuth aids programmers

By WARREN AGEE

Programming in Extended BASIC can be confusing at times. Since BASIC is not a structured language, GOTOs, GOSUBs, and variables are often scattered throughout programs, making things messy and hard to read. The only help an Extended BASIC programmer has had in the past was Programming Aids III, a cross-reference program that was s-s-slow and very cumbersome to use, and Neatlist, a freeware offering which does make listings easier to read but with few features.

Utilitee Software, a brand new company from the Detroit area, has just come out with XB Detective, which is simply the most useful utility a BASIC or Extended BASIC programmer could have in his toolbox. It is written entirely in assembly language, and may be loaded into Extended BASIC or console BASIC with Editor/Assembler or Mini-Memory installed. It auto-loads from From Extended BASIC. From BASIC, merely type in:

CALL INIT
C A L L
LOAD("DSK1.DETECTIVE")

Once the program is loaded, you may load in any BASIC or Extended BASIC program, or begin to type in your own program¢Detective resides in memory with your program. In fact, XB Detective does not have to be in memory to begin with; you may load in the BASIC program first, then type in the above two lines to load in XB Detective.

The following is a list of options which you may perform on the BASIC program once the utility is loaded into the machine:

1) List Variables
2) Find Variables
3) Find Reserved Words
4) Delete Lines
5) String Search
6) Return to BASIC

For instance, if you select option 1, XB Detective will list all of the variable names in your program within seconds. With option 2, you may choose the variable name for which you want to search, and the line number with which to start the search, and XB Detective will instantaneously list to the screen (or printer) all of the line numbers containing that variable. "Find Reserved Words" works in exactly the same way. "Delete Lines" allows you to quickly and easily delete an entire block of line numbers, instead of typing: line number to delete, (enter), line to delete, (enter).

Lastly, with "String Search," you may choose to search for a string that is enclosed in quotes, in a data statement, or in a CALL statement. For example, suppose you want to find all the occurrences of RS232/2 in a program; you want these changed to your printer specification, say PIO. All you do is select String Search, then search for a string in quotes, namely "RS232/2." XB Detective will list to the screen all occurrences of "RS232/2" in your program. You may optionally print out the results. Now, perhaps, you want to find all the occurrences of the CALL LOAD statement. CALL LOAD is not available under the Find Reserved Words option, but it is under String Search. Just select In a CALL Statement, then enter LOAD for the string. Similarly, you may search for CALL CLEAR, CALL COLOR, CALL SPRITE, etc.

Performance: XB Detective operates flawlessly. I could honestly find no bugs whatsoever. It does exactly what it is supposed to do. It is very fast and efficient.

Ease of Use: Here is the best part: this program is INCREDIBLY easy to use. With practically all of the assembly utilities up till now, one had to use cumbersome CALL LINK statements to access the new functions. Not here. All that you need do his hit FCTN-7 (AID) and you are presented with the menu of options. From here on everything is menu driven. Once you select option 6 "Return to BASIC," the screen is restored to the condition it was in when you hit FCTN-7.

Finding a deficiency in this program is very difficult, though I believe one minor drawback is that not every reserved word can be searched with XB Detective. Most of the major ones are present on the menu, but not all. For instance, RANDOMIZE and RND are not available for the search. A function that I found missing (now I am getting picky) is an "Oops" key. This would recover a program lost by typing NEW. I am told that this program uses up every bit of the 8 kilobytes of space allotted for assembly language in the expansion memory; if more memory were used, it would infringe on the size of the Extended BASIC program you are editing. Having that limitation would be worse than not having an "Oops" key.

Value: For $19.95, this program cannot be beat. In addition, it is designed to be fully compatible with the TI,

(Please turn to Page 49)

Review

Report Card

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

Price: $19.95
Manufacturer: Utilitee Software, P.O. Box 7275, Dearborn, MI 48121
Requirements: console and monitor or television, expansion and disk system, Extended BASIC, Editor/Assembler or Mini-Memory, printer optional

Console Writer 2.1

A speedy word processor

By BILL GASKILL

This review was written using Console Writer 2.1 from Navarone Industries.

Like every other Navarone product I own, Console Writer is written in assembly language and therefore is extremely fast in its operation. In fact, it is *the* fastest booting word processor I have ever used. Though I didn't time start-up operations, it couldn't take more than a few seconds to plug the module in, press any key to get off the TI master screen and then press 2 for Console Writer.

That is all it takes to get the program started. The main menu appears instantaneously, much faster than any of the TI modules I own. No prompting to wait "ONE MOMENT PLEASE..." with Console Writer. Just right to business.

From the main menu you press the 4 key and begin typing. In short, for speed and ease of access, Console Writer is without equal anywhere.

Also as with all Navarone products that I own, Console Writer's documentation leaves much to be desired. Although it is not as bad as the horrible mess included with my Data Base Management System, it is equally as sparse, though not as useless. The documentation takes up a whole six pages in the manual, one of which is wasted on a disclaimer. Examples for various program operations are nonexistent. What you get are worthless little notations like "Adheres to the TI99/4A file naming procedures." I sure hope Will Hadley and company have gotten the message on the importance of adequate documentation.

Main menu options include:

1. SET SCREEN COLOR
2. SET UP PRINTER
3. GET DOCUMENT FILE
4. EDIT DOCUMENT
5. SAVE DOCUMENT FILE
6. PRINT DOCUMENT

Each option is accessed simply by pressing the number key that precedes the desired operation. Again, access to any operation from any other area in the program is lightning quick. Blazing speed is certainly a big feature of this application.

Setting screen colors is a treat. Rarely will you get the opportunity to choose from a greater array of options. Console Writer 2.1 allows you to set the Background, Foreground, Highlight and Enhanced areas of the screen to any of 16 different colors/hues for each one of the four areas. Of course you may elect to accept the default colors and just simply begin typing without even messing with color changes.

Setting up the printer is less exciting, but even easier. In fact, if you have a parallel I/O interface, don't even bother pressing number 2, since the default is PIO.

GETting a document file is Navarone's way of saying this is the LOAD option. Here, one simply types in the name of the file to LOAD, preceded by the device name (DSK1 or CS1 and the file name) and presses ENTER. Loading is fast and efficient.

Editing a document is the EDIT mode. Here, the program offers the ability to crank out text as quickly as one can type. Unlike TI-Writer, Console Writer can keep up with a fast typist when the screen moves from the far right to the far left window. No characters are lost in the transfer. A total of 10 options are available in the EDIT mode to manipulate text. All are accessed via Function keys.

1. deletes a character
2. inserts a space
3. erases to the end of a line
4. clears the screen
5. toggles the 28 column window
6. jumps backwards, one 15 line screen
7. deletes an entire line
8. inserts a blank line
9. returns program to main menu

+. performs the same function as number 9

Curiously, while Console Writer 2.1 offers the ability to jump backwards a screen at a time, one cannot jump forward. In other words, to get to the bottom of a page, you must hold the Fctn X (down arrow) key to scroll downwards. This can be a real inconvenience when going back into the EDIT mode in a file that has a page or more of text.

Many of the other features of more expensive word processors such as moving text around the page in blocks, justification and special printing functions are also absent. When it comes to editing a document, Console Writer 2.1 is what you might call a "plain paper" word processor. In other words, it is not chock-full of fancy features. It simply performs text editing in a simple and easy-to-use manner. You must manually insert spaces to tab, press ENTER twice to get double spacing (the printer cannot be told to do it), press ENTER prior to the end of a line (or the word will be cut off wherever you left it at column 80) and you must guess what line

(Please turn to Page 49)

Review

Report Card

Performance	**A**
Ease of Use	**A+**
Documentation	**C**
Value	**A**
Final Grade	**A**

Cost: $29.95

Manufacturer: Navarone Industries, 19968 El Ray Lane, Sonora, CA 95370

Requirements: Console, monitor or television, cassette recorder or disk drive, printer.

4A/TALK—

(Continued from Page 42)

the configuring is done it is ready to go. Now, for reference purposes, you may press CTRL 7 and a menu listing every command appears on the screen. There is no other terminal emulator program that I know of that allows this convenient operation.

You can also turn the ASCII buffer on and off, reset the buffer, send it to the printer and most of the usual commands. However, when the buffer is full it doesn't automatically dump to the disk, though it does keep the buffer intact.

Documentation: Possibly the best point of the package is the 32-page manual. It leaves little to the imagination. Every function is thoroughly explained to the last detail: How to load the program, function keys, how to write a configuration file, using the printer, how to do file transfers, how to use the autodialer, a glossary of terms, control characters, RS232 software switches, and color tables.

There seems to be an item missing, however: how to use the ASCII file to upload continuously. It mentions line-at-a-time.

I found a change file that mentions when using the "Keyboard Files" that to do a line-at-a-time transfer you should use the same character for XON and XOFF. But if you make these values different it will do a continuous file transfer. This applies only to ASCII uploads.

Value: The bottom line is this: If you need a program for all three types of telecommunications protocols, this one will fit the bill. If you can make do with a relatively small ASCII buffer, this program will fit you to a tee. The savings on the wear and tear on your drives alone makes this program a worthwhile investment.

XBASICII+—

(Continued from Page 45)

essible to those who have limited programming abilities. (This is due primarily to the extensive use of examples in the manual that demonstrate how to use each statement in a program. Programming statements are similarly described, but the use of them in one's own programs seems to require a more-than-passing familiarity with Extended BASIC programming.) For example, the GPEEK subroutine is intriguing in so far as its function is to read the contents in GROM (Graphics Read Only Memory). However, it is the one statement that is not well-documented in the manual. In fact, the manual refers the reader to a book called TI99/4A Intern, which Mechatronics expects to publish this month.

The graphics statements allow the user to address every pixel on the screen (256x192), with control over foreground and background colors. The graphics may be stored on a floppy disk for later use. Although the user may open a maximum of only two files while in the graphic mode, it is easy to move in and out of the standard and graphic modes through program statements.

XBII+ offers the user two modes of operation: the standard mode and the extended graphics mode. When planning to use the extended graphics statements, it is necessary to enter CALL APESOFT to initialize the expansion memory followed by CALL LINK("GRAFIC",MODUS).

Ease of Use: Extended BASIC II

(Please turn to Page 49)

STATEMENTS—

(Continued from Page 45)

IFSET—checks whether a pixel with the coordinates of X, Y is set.
MOVE—used to draw a line of a given length starting from the current cursor position.
REMOVE—like MOVE only erases line.
MOVETO—draws a line from the current internal position of the cursor to the next using X, Y parameter.
REMVTO—like MOVETO, only lines are deleted.
TURN—used to add to the current internal angle of the cursor in degrees.
TURNTO—sets the internal angle of the cursor in degrees.
RECT—used to draw rectangles.
CLRECT—used to erase rectangles.
CIRCLE—draws circles using X, Y and R (radius) parameters.
CLCRCL—erases circles.
ARCUS/CLARCS—draws arcs/erases arcs.
ELLIPS/CLLIPS—draws ellipses/erases ellipses.
VALUES—returns current parameters of row (X), column (Y), angle, foreground and background colors.
AXIS—draws system of coordinates based on center point, lefthand axis, righthand axis, pitch of the L/R axis, top axis, bottom axis and pitch of the top and bottom axis.
HSTDIA—draws a block diagram based on height, width and depth of the block.
CRCDIA—draws circular diagram based on X and Y coordinates, radius, the starting angle and final angle of the circular segment.
WRITE—enables the mixing of graphics and text.
DSPLAY—corresponds to DISPLAY AT, uses row, column, size and string variable. Graphic values located under a string are erased, which is the difference between WRITE and DSPLAY.
ACCEPT—corresponds to ACCEPT AT.
SHIFT—performs linear transformation of the graphic (moves it).
GSAVE—used to save screen displays.
GLOAD—used to load screen displays.
BHCOPY—produces screen dump of display in bit image mode, in single or double-density

XBASICII+—

(Continued from Page 48)

Plus replaces the standard Extended BASIC. Anyone who has Extended BASIC should have a good idea of what is involved in XBII+. Having TI's Extended BASIC manual is a must, since the XBII+ manual describes only those statements and commands that are not part of Extended BASIC.

Documentation: I have seen two manuals for XBII+. One is in German and the other is a draft of the English version. Aside from errors of syntax and word usage, the English version is quite helpful. The reliance on programming examples to illustrate the use of each command and statement is extremely beneficial. The draft manual is more than 100 pages long, printed on 8½ x 11 paper. The German version is typeset and printed on white paper with a glossy cover on book-sized paper.

Value: Anyone looking for a back-up Extended BASIC cartridge certainly should give thought to purchasing this version. (Because it does not include TI's Extended BASIC manual I do not recommend it to those who have yet to buy Extended BASIC.) The $98 price tag does not seem to be out of line, considering that you are getting TIs Extended BASIC plus 8 kilobytes of additional statements.

CONSOLE WRITER 2.1

(Continued from Page 47)

number you are on. When writing this review, I would have to press the down arrow key 60 times to get to the bottom of my page, then write in a line number flag so that I would know when the bottom of each page had been reached.

I also had to limit myself to one page per file and name each page separately since Console Writer 2.1 holds only about 1½ pages of text. It also only warns you of the buffer full condition when it actually occurs.

Another quirk I found rather interesting was the fact that while Console Writer 2.1 files can be loaded by TI-Writer, they cannot be edited. Trying to edit a file caused TI-Writer to lock up.

Saving a document is as simple as Loading one. Simply type in the device name and the file name (disk device only) and press ENTER. In saving or loading to cassette, Console Writer 2.1 appears to save the entire buffer rather than just the text that exists in the file. This causes a longer wait than necessary but is of minor inconvenience. Besides, the Mini-Writer word processor I also own does the same thing. Perhaps it is a necessary evil in cassette storage media.

Printing a file, as mentioned earlier, is a breeze. What you typed on the screen in the EDIT mode is what you will get on paper. Nothing less and nothing more. Twice during attempts to print other text files that I have prepared, the program went squirrelly. I have no idea what the problem was, nor has it appeared again. So I guess I'll chalk it up to "break-in" of a new module. One last little quirk of the program I will let you in on. You cannot use the Fctn 7 (delete a line) feature to delete text that does not begin at the position of the cursor. In other words, if the cursor is at column 1 and the first word is at column 5, as in an indented paragraph, you must use Fctn 3 (delete to end of line) to erase the line. Fctn 7 will not do the job.

In summary, Console Writer 2.1 is perhaps the best value a TI owner can buy if you are looking for a simple and easy-to-use text processing tool. While it lacks many of the features of a "high-powered" word processor such as TI-Writer or Companion, it does not promise to be a competitor with those products. Console Writer 2.1 can be used by any TI owner, with any system configuration. It is certainly ideal for the console, cassette recorder and printer only owner. However, it also shines for the owner of a full-blown TI system since it offers the ability to boot up, crank out your letter or memo or whatever and get it printed in the shortest time I know of.

While this product has a couple of quirks, it is (are you ready for this?), in my opinion, the BEST Navarone product to date. It is a must for your library if speed and simplicity of use are concerns in your word processing needs.

XB DETECTIVE—

(Continued from Page 46)

CorComp, and Myarc disk controllers. If you are an avid BASIC or Extended BASIC programmer and you have a fully configured system, you will find yourself reaching for XB Detective time and time again. And even if you are not heavily into programming, just think of how many times you wanted to modify someone else's program to fit your system. XB Detective makes the entire process much easier.

Disk Master I set for Faire display

Todd Kaplan, author of the Diskmaster program, has entered into an agreement to write Diskmaster I for DataBioTics.

According to Bill Moseid of DataBioTics, the program has the functions of the CorComp Disk Manager except for the interlace function, as well as some new functions.

Moseid says the program works with TI, CorComp and Myark disk controller cards and will format the Myark to 1260 or 1440 sectors. It will configure the screen and allow it to handle up to six disks and display information in hex or ASCII.

Moseid said that Diskmaster I, which retails for $19.95 is among the products scheduled to be shown at the DataBioTics booth at the Chicago TI-Faire. He said Kaplan will be on hand at the booth, along with Tom Frerichs, co-author of 4A Talk and Jerome Prinkl, author of Mini-Writer.

No SVC catalogs

Users will not receive a free catalog by writing SVC Computer Company of Round Rock, Texas, as announced in the August issue. The company is not in business.

Newsbytes

New TI parts number

We have been informed that the Texas Instruments Parts Department has changed its telephone number from that published in our August Feedback column. New number is (806) 762-7457.

Winchesters offered

John J. Meshna Jr. Inc. of Lynn, Massachusetts, offers a Winchester disk drive system for the TI99/4A.

The system is based around the Myarc system which is no longer produced. Several changes have been made by Meshna from the original Myarc system.

The first is that a single floppy disk drive is included in the same case as the Winchester hard disk drive. The second is that the "Time of Day" clock which was optional in the original Myarc system is standard in the Meshna system.

The five-megabyte Winchester system with one single-sided floppy disk drive sells for $1,200. A 10-megabyte Winchester system with one single-sided floppy disk drive sells for $1,400. A five-megabyte Winchester system with one double-sided floppy disk drive is $1,300 and a 10-megabyte Winchester system with one double-sided floppy disk drive is $1,500. The double-sided mini floppy drive replaces the single-sided drive in the case when ordered.

Each system comes with one 5¼" Winchester disk drive, one 5¼" mini floppy disk drive, power supply fan and controller card enclosed in a metal case. Also included are all cables, personality card which plugs into the TI Expansion Box, two 5¼" floppy diskettes and a users manual.

The mini-floppy drives will run only in a single-density mode when used with the TI controller. They will run in a double-density mode when used with either a Cor-Comp controller or a Myarc controller. The controller provided with the Winchester system is strictly for running the Winchester drive only.

Systems sold by Meshna have a 90-day parts and labor warranty.

For further information, contact John J. Meshna Jr. Inc., 19 Allerton St., Lynn MA 01904 or (617) 595-2275.

Microtech sells disks

Microtech International Inc., a Connecticut-based company with additional offices in Japan, is selling BASF diskettes for the TI99/4A.

The 5¼" single-sided, double-density disks for the TI99/4A, PHP1850, sell for $1.15 each, 10 per box.

The double-sided double-density disks for the TI-Pro, 810, are $1.20 each, 10 per box, and the DS/DD 96TPI for the Business System 200 are $1.50 each 10 per box.

The company requires a minimum order of $100 and does not permit splitting boxes.

For further information, contact Microtech International Inc., 29 Business Park Drive, Branford, CT 06405 or 1-800-626-4276.

Trinity offers game

Trinity Systems offers USA States and Capitals, a game designed to teach youngsters and adults about the United States.

The game incorporates high-resolution graphics, sound effects, flashing colors and text.

The game is available on cassette for $12. It is designed to be played by one or two players or teams. The object of the game is to identify a state and its capital as indicated on the USA/Graphic map. Identification is accomplished by typing in the state or capital name as prompted by on-screen instructions. Points are given for each correct letter in the name and bonus points are rewarded for an entirely correct entry. Musical tones accompany the evaluation of a state or capital name and flashing colors and further rewarding tones accompany bonus points. Scores and game status are kept on the screen.

If an entry is incorrect the first misspelled letter is highlighted, a buzzer sounds and the correct answer is displayed accompanied by musical tones the developers describe as "slightly mocking." After 10 state and capital pairs are alternately guessed by each player, the winner (if two players) is indicated and the final score(s) evaluated. The 10 evaluations range from Perfect for the best possible score to See Tutor and Use a Map for the lowest scores.

The Tutor mode indicates a state's location on the USA/Graphic map and then displays that state's name, capital and nickname. Tutor moves through all 50 states alphabetically at the touch of any key. If a key is held down, Tutor shows only the state location and name and then moves to the next state. When the key is released, Tutor will also show that state's capital and nickname.

Trinity Systems was founded in 1984 by David Butalla and Philip Van Sickel, who say their purpose is "to provide entertaining, educational and Christian software for better utilization of home computers."

For further information, write Trinity Systems, 1022 Grandview Ave., Pittsburgh, PA 15237 or call (412) 366-5811.

Trivia games differ

Robert Wessler of Fort Worth says that his Trivia 99er game program offered as freeware should not be confused with Trivia 99® , written by Ken Kuehnle and marketed by Tex-Comp of California.

Clarification

Asgard Software officials have announced that the top line of their advertisement for their Schedule Manager, advertised in the August MICROpendium, should have read

(Please turn to Page 51)

Newsbytes

(Continued from Page 50)

"TI BASIC subset of this program featured on cover of HCM."

PRE/SST program

SST Software offers the PRE/SST program, a program translator aid which facilitates preparing existing BASIC and Extended BASIC programs for processing by the SST Compiler System.

According to the manufacturer, the program allows the user to write programs with any length variable names, to use imbedded numeric constants, to DIM multiple arrays within the same statement and to use the in-line (!) remarks. The manufacturer says the program frees the user from defining all his variables and constants at the beginning of the program and converts multiple-line statements to single lines.

The manufacturer says that the program, which sells for $30, changes all variables into the correct form for the SST Expanded BASIC Compiler, changes all string and numeric constants into variables for processing, inserts "LET" statements at the beginning of the program for all variables and constants, breaks all multiple statement lines (::) into separate lines and deletes in-line (!) remarks, or optionally converts them into separate-line REM statements.

SST announces that the Graphics Package for the compiler has been reduced to $15. This package also contains all of the latest revisions and corrections to the Expanded Compiler. Users who would like a copy of the revisions and corrections only may send $6. The correction disk is not required for the compiler labeled SST5 or SST/EXP1.

For further information contact SST Software Inc., Box 26, Cedarburg, WI 53012 or (414) 771-8415.

Bull Board 2 runs

A Caltex BBS, The Bull Board 2, runs 24 hours a day, seven days a week, in Upper Marlboro, Maryland.

Number is (301) 927-7079.

SAC TIBBS offers files

Woody Large of Sacramento, California, operates a TIBBS software BBS 24 hours a day.

It has download and upload capability at 300 and 1200 baud. No charge is made for downloading freeware or public domain files or programs. The name is SAC TIBBS and the phone number is (916) 927-3012.

Enterprise programs

Enterprise software announces six programs for the TI99/4A

SQUEEZE is a program written for TI BASIC which will also run in Extended BASIC. Two players compete against each other by controlling an ever-growing line. Players must not touch anything or they lose one round. A player loses the game after losing 10 rounds. Joysticks are required. Price is $15.

A BASIC one-player game called DRAGONS requires the user to try to find the elusive dragon and slay it. The dungeon has 100 rooms and the contents of them are different in every game, according to the manufacturer. Price is $15.

An Extended BASIC game called STARR TREKK is a one-player game in which the user attempts to pilot a ship back to earth while dealing with enemies and asteroids. Combat is depicted three-dimensionally, with enemy crafts growing larger as they approach, according to the manufacturer. The user may refuel at space stations. Variations exist for eight levels. Requirements are a disk system, Extended BASIC and 32K memory expansion.

INVOICER is an Extended BASIC invoice creating program, in which "all repetitive things such as the company header are stored on diskette," according to Robert Petrocone, Enterprise Software's president. It requires a disk system and Extended BASIC and is priced at $17.

FASSSST LOADER is an Extended BASIC program which allows a user to run any program with two key strokes, and also delete files and print out a hard copy, according to the manufacturer. The catalog is read and placed on the screen. The top of the screen shows disk name, free and used sectors, number of files and a list of the keys and their functions. Below that is placed the catalog, which can be paged through if it does not all fit. The cursor can be moved up and down to choose programs to run and delete. The unprotected program requires a disk system and Extended BASIC and sells for $17.

ALPP, which stands for assembly language producing program, is an Extended BASIC program which the manufacturer claims will write assembled code without an Editor/Assembler and does not require knowledge of assembly languages. The manufacturer says that with the program, an entire screen (graphics or text) can be placed on the screen with one line in about three seconds. The program requires a disk system, Extended BASIC and 32K memory expansion and is priced at $17.

Petrocone says that custom programming is available from the company, an estimate will be made for a $5 fee.

For a limited time, the company offers a second diskette or cassette filled with "best of public domain programs," and those ordering more than once will receive another diskette or cassette with different unprotected programs.

For further information or a free catalog, write Enterprise Software, 561 Watkins Drive, Mineola, NY 11501.

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

NUMTALK

The use of CALL SAY provides Extended BASIC programmers with the capability of enhancing their efforts with speech. Unfortunately, there are some limitations to the use of CALL SAY, among which is the limited vocabulary of the speech synthesizer. This is evident when using numbers. For example, the number 1 will be pronounced by the speech synthesizer. However, the number 123 will be pronounced 1-2-3, rather than "one hundred twenty-three." A Swedish programmer, Anders Persson, has developed a subroutine that gets around this pronunciation problem, which was published in the newsletter of the Mid-Atlantic Ninety-Niners by Maurice E. T. Swinnen.

The subprogram, which is usually kept in a MERGEd format, can be used only in a program and cannot be accessed directly from the keyboard. Extended BASIC, disk system and an expansion memory are required. The correct format to use is CALL SAY_NUM(). The may be any number between 0 and 999. Swinnen offers the following program as an example:

```
100 CALL CLEAR
110 CALL SAY("999")
120 CALL SAY_NUM(999)
130 END
```

Now, if you merge NUMTALK into this program and run it, you will notice the difference.

Beyond this, Swinnen notes, you may add a FOR-NEXT loop to permit counting by the CALL SAY statement. Here's an example:

```
100 CALL CLEAR
110 FOR I=499 TO 510
120 CALL SAY_NUM(I)
130 NEXT I
140 END
```

And here's another variation we're all familiar with:

```
100 FOR I=5 TO 0 STEP -1 :: CALL SAY_NUM(I) :: NEXT I
120 CALL SAY("TAKE+OFF")
```

Here is the subroutine listing:

```
25000 !NUMTALK, a subprogram
 which allows pronunciation
of numbers correctly in a CA
LL SAY statement
25010 !Can be used in a prog
ram only. Correct format is:
 CALL SAY_NUM(#)
25020 !# Can be any numerica
l data between 0 and 999.
25030 !Keep NUMTALK in MERGE
d format, to be merged with
any program that may be need
ed.
25040 ! Author: Anders Perss
on, Lund, Sweden
25050 SUB SAY_NUM(NR)
25060 IF INITED THEN 25120
25070 DIM TEXT$(33)
25080 RESTORE 25370
25090 FOR I=1 TO 33 :: READ
TEXT$(I):: NEXT I
25100 NUMPOS$="-+.E012345678
9"
25110 INITED=-1
25120 NUM$=STR$(NR)
25130 IF ABS(NRA)>=1000 OR A
BS(NR)<10 THEN 25210
25140 NEG=(NR<0)
25150 IF NEG THEN NUM$=SEG$(
NUM$,2,LEN(NUM$)):: NR=ABS(N
R):: CALL SAY(TEXT$(1))
25160 IF NR>=100 THEN GOSUB
25240 !SAY HUNDREDS
25170 ON ERROR 25400
25180 IF VAL(NUM$)>=20 THEN
25300 !SAY TY'S
25190 IF VAL(NUM$)>=10 THEN
25350 !SAY TEENS
25200 !SAY DIGITS
25210 FOR I=1 TO LEN(NUM$)::
 CALL SAY(TEXT$(POS(NUMPOS$,
SEG$(NUM$,I,1),1))):: NEXT I
25220 SUBEXIT
25230 !SAY HUNDREDS
25240 SPEAK$=TEXT$(POS(NUMPO
S$,SEG$(NUM$,1,1),1))&TEXT$(
33)
25250 IF SEG$(NUM$,2,2)<>"00
" THEN SPEAK$=SPEAK$&"+AND"
25260 NUM$=STR$(VAL(SEG$(NUM
$,2,LEN(NUM$)))):: IF NUM$="
0" THEN NUM$=""
25270 CALL SAY(SPEAK$)
25280 RETURN
25290 !SAY TY'S
25300 SPEAK$=TEXT$(VAL(SEG$(
NUM$,1,1))+23)
25310 IF SEG$(NUM$,2,1)<>"0"
 THEN SPEAK$=SPEAK$&"+"&TEXT
$(POS(NUMPOS$,SEG$(NUM$,2,1)
,1))
25320 CALL SAY(SPEAK$):: NUM
$=SEG$(NUM$,3,LEN(NUM$))
25330 GOTO 25210 !TO SAY DEI
GITS
25340 ! SAY TEENS
25350 CALL SAY(TEXT$(INT(VAL
(NUM$))+5)):: NUM$=SEG$(NUM$
,3,LEN(NUM$))
25360 GOTO 25210 !TO SAY DIG
ITS
25370 DATA NEGATIVE,,POINT,4
,ZERO,ONE,TWO,THREE,FOUR,FIV
E,SIX,SEVEN,EIGHT,NINE
25380 DATA TEN,ELEVEN,TWELVE
,THIRTEEN,FOURTEEN,FIFTEEN,S
IX+TEEN,SEVEN+TEEN,EIGHT+TEE
N,NINE+TEEN
25390 DATA TWENTY,THIRTY,FOR
TY,FIFTY,SIXTY,SEVENTY,EIGHT
Y,NINETY,+HUNDRED
25400 RETURN 25410
25410 ON ERROR STOP :: SUBEN
D
```

GROM replacement

Leroy Thompson of the Northeast Tarrant (County) Home Computer Users Group (Texas) notes that in some cases there may be no replacement for genuine TI parts, at least not when it comes to replacing a GROM port connector. Writing in his user group newsletter, he reports: "When I began the search for a replacement GROM port connector I didn't expect to encounter any great problem. However, I have been unable to to locate any locally. There are many connectors with gold-plated contacts listed in catalogs but they are all special order, which involves a minimum buy. I was also alerted to another technical problem. When a connector with gold contacts is soldered to a tin-plated circuit trace a phenomenon known as 'gold migration' begins and it ends in corrosion. It

(Please turn to Page 53)

User Notes

(Continued from Page 52)

is suggested that you order Part No. 1049693-1 ($5.84+ $1.50 shipping) from Texas Instruments Inc., Dealer Parts Dept., P.O. Box 53, Lubbock, TX 79408."

Users may want to include a description of the part ordered when doing this.

Print file tips

Howard Cunningham made note of two tips that are useful when using the Print File command of TI-Writer. The items appeared in the newsletter of the Brevard Users Group Inc. in Satellite Beach, Florida.

According to Cunningham, when you want to print a file with line numbers enter the following: L PIO.LF. This will print the line numbers plus 74 characters per line.

When you want to print a file but do not want to send linefeed or carriage return control codes, enter the following: C PIO.LF.

New address for firm

Thomson Software (D.I.P.) has a new address and telephone number.

Address is 1461 Beach Street, Muskegon MI 49441-1099. Telephone number is (616) 726-4602.

Amortize

The following program is used to amortize loans. It was submitted by Tom Bergeron of Normandy, Missouri.

Users input the amount of the loan, the interest rate (make sure you use a decimal point) and the number of payments. The results will be outputted to a printer. Those who use RS232 ports with printers will have to modify line 170 to suit their printers. The output may also be displayed to screen by eliminating the OPEN command and modifying the PRINT statements. For example, eliminate "-2:" in line 370 and replace the commas with semicolons. Other adjustments may also be made to improve the screen display. The program requires Extended BASIC to operate.

```
100 DEF FMT=INT(NU*10^P
L+.5)/10^PL
110 INPUT "AMOUNT=":A
120 INPUT "INTEREST RAT
E=":I
130 INPUT "TOT NUM OF P
AYMENTS=":J
140 H=INT(0)
150 C=0
160 D=A*((I/12)/(1-(1/(
(1+(I/12))^J))))
170 OPEN #2:"PIO"
180 PL=2
190 NU=D
200 D=FMT
210 PRINT #2:"THE PAYME
NT IS ",D ::
220 PRINT #2:"PAYMENT#
      INTEREST       PRI
NCIPAL      LOAN BALANCE
" ::
230 CALL CLEAR
240 CALL SCREEN(6)
250 PRINT :"THE PAYMENT
IS",D ::
260 PRINT "PRESS THE 'S
' KEY TO STOP"
270 H=H+1
280 E=A*I*J/(12*J)
290 F=D-E
300 A=A-F
310 NU=E
320 E=FMT
330 NU=F
340 F=FMT
350 NU=A
360 A=FMT
365 IF H=J+1 THEN 480
370 PRINT #2:H,E,F,A
380 CALL KEY(0,KY,STT)
390 IF STT=0 THEN 270
400 IF KY=83 THEN 410
410 INPUT "ENTER 'Q' TO
 QUIT ===>":Q$
420 IF Q$="Q" THEN 460
430 CLR=INT(14*RND)+2
440 CALL SCREEN(CLR)
450 GOTO 270
460 CLOSE #2
470 STOP
480 END
```

Bomb-proofing

This tip comes from the Jackson County 99ers via the Atlanta (Georgia) 99/4A Computer Users Group. It has to do with eliminating a problem with Tom Knight's *TK-Writer* that results in crashing the program whenever one tries to use the (S)how (D)irectory command. While TK-Writer virtually eliminates the need to use the TI-Writer cartridge to use the TI-Writer programs, the directory command resides in the cartridge. Thus, whenever calling up the SD command out of TK-Writer the program is dropped from memory and the computer's title screen suddenly takes over.

This fix is permanent, in so far as it requires modifying the EDITA1 file. You will not be able to use the SD function, even when using the TI-Writer cartridge. However, with this modification, you will eliminate the danger of losing the program when inadvertantly calling for a directory through TK-Writer.

Using a sector access program, locate the third sector of the EDITA1 file. the hex values at bytes 14 and 15 are 53 and 44 (ASCII S and D). Change the 53 to 20 (space character). Leave the 44 alone. Save this change to disk.

Now if you try to SD with TK-Writer the program will return to the command line without any loss of data.

GRAPHX delays

A postal strike in Australia is reportedly causing delays in GRAPHX being shipped to dealers in the United States.

GRAPHX, a graphics program, is produced in Sydney, Australia.

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. MICROpendium will pay $10 for any item sent in by readers that appears in this column. Mail tips to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

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