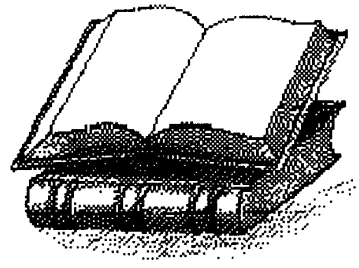
Covering the TI99/4A and the Myarc 9640

MICROpendium

Volume 7 Number 5 June 1990 $2.50

Learning to read with Regena



MY-MENU gives Geneve users control over their disks

INSIDE

A DOS-like directory program in Extended BASIC

Upgrading the Foundation Computing 128K RAMdisk to 512K

Expanding your system with extended keyboards and 80-column cards

Bill Gaskill shows you how to get more out of TI-Base, starting with faster loading

Introducing a new programming column

Barry Traver shows how to combine Extended BASIC with assembly language

REVIEWS

Quest RD200 RAMdisk, 'Artoons, Funnelweb 80-column upgrade, Coney Games, Multiplan Exercises

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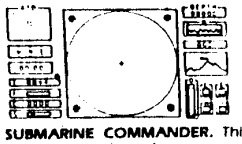

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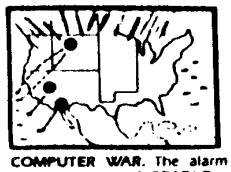

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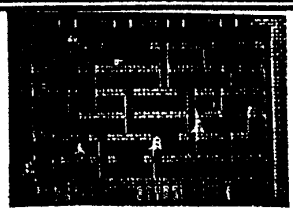
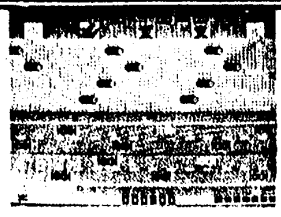


MIDNIGHT MASON
Avoid the ghosts who chase you while you gather up your tools from a haunted mansion.



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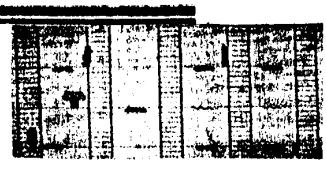

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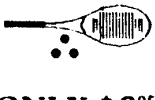
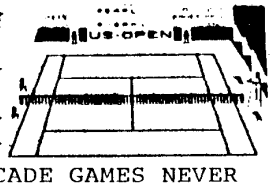


Championship Tennis lets you enjoy the excitement, action and thtrills of a professional tennis match with complete control.

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

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



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*READ THIS

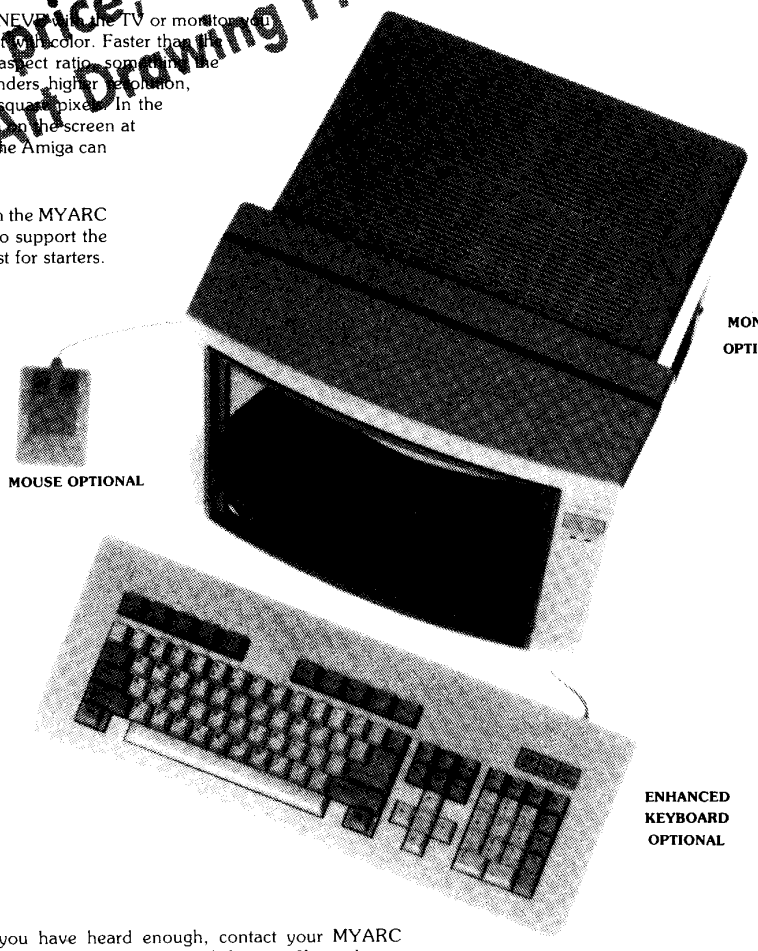
Here are some tips to help you when entering programs from MICROpendium:
1. All BASIC and Extended BASIC programs are run through Checksum, the numbers that follow exclamation points at the end of each program line. Do not enter these numbers or exclamation points. Checksum was published in the October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

THE GENEVE 9640 HAS LANDED

You will recognize it by its trade mark, a graceful gray swan swimming on blue water, an apt symbol. The ugly duckling TI no longer wanted, is no ugly duckling anymore. The GENEVE has surpassed everyones expectations, even our own; with power, speed, graphics, and adaptibility not found in other microcomputers. In fact, the GENEVE does so much, this ad can only begin to tell you about it.

- **Near 100% Compatible:**
  - If you have a program written in Basic, Extended Basic, XBII, Assembly Language, Forth, Pascal, you name it, if it runs on the 99/4A then it is near certain to run on the GENEVE.
- **32K No Wait State High Speed RAM:**
  - Programs like MultiPlan, which are painfully slow on the 99/4A, run many times faster, thanks to the High Speed RAM.
- **V9938 Video Processor with 7 Graphics Modes:**
  - Compatible with the 99/4A so you can use the GENEVE with the TV or monitor you are currently using. Same resolution as the Mac but with color. Faster than the Amiga, as fast as the Atari and does it with true aspect ratio something the Amiga and IBM AT can not do. As an aside renders higher resolution, better color, and appearance, through the use of square pixels. In the high resolution mode, 256 colors may be displayed on the screen at one time by the GENEVE, eight times as many as the Amiga can display in its high resolution mode.
- **Mouse Interface:**
  - The mouse interface is built in and ready to use with the MYARC mouse. But, we didn't stop there, it is also ready to support the newest hardware like video digitzers, and that's just for starters.
- **6 Complete Pieces Of Software Are Included WithThe GENEVE. But, three you will not be able to see how you ever did without are:**
  - My-Word Processor; 80 columns, help screens for all modes of operation including control-U, initialize a disk without leaving the program, print formatted text to the screen for viewing before sending it to the printer and that's still not all My-Word will do.
  - Advanced Basic; the best and most powerful basic on the market today.
  - Pascal V4.21; if you have a standard USCD Pascal program, you will be able to run it with this program. If you do not have any Pascal programs, let me tell you, one of the largest library of programs available, is Pascal. Compilers for Fortran, Modula 2, Lisp, and Pilot, as well as business programs from A to Z, are all there. USCD Pascal Software developed for computers from Apple to IBM, will run on the GENEVE, without modification.

Now at new lower price, includes Myarc Mouse and MY-Art Drawing Program



MONITOR OPTIONAL

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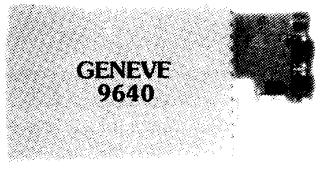

If you have heard enough, contact your MYARC dealer, they have one in stock for you. If you do not know who your stocking MYARC dealers are, or, if you want to know more about the GENEVE, telephone the number listed below, or mail your name and complete address with zip code to the address shown below.We will be happy to mail you a brochure covering the GENEVE in detail and a list of our stocking dealers. Supplies of the brochure are limited, so please hurry.

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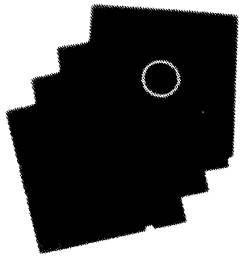

Comments

Canadians lose Laflamme shop

This month's Comments column is devoted to news items from TI vendors and groups. (Actually, we couldn't fit in the Newsbytes page so the material is being used here.)

A quick addendum to this month's Expanding your System article: The item concerning the Mechatronics 80-column card is based on information from earlier versions of the device. Mechatronics ceased production of this device last year. However, according to Chris Bobbitt of Asgard Software, Asgard has an agreement whereby the device will be available if a minimum order requirement is fulfilled. According to Asgard, this version of the Mechatronics card is enhanced and will work with a composite monochrome monitor as well as color monitors. Also, the documentation is being rewritten. (The documentation that came with the original Mechatronics card was poorly done.) Other enhancements include improved software and internal program code.

Asgard is planning to sell the card for about $210, including shipping. Those who are interested in ordering the device should contact Asgard (P.O. Box 10306, Rockville, MD 20850; 703-255-3085).

LAFLAMME & WRIGLEY PHASING OUT BUSINESS

The "wind-down" of Laflamme & Wrigley has been announced "with great regret" by Jane Laflamme.

She says, "We have realized in the last year that the TI world is unable to support a Canadian distributor, but were continuing on a part-time basis, supplementing income through another venture. But because of a change in my personal life, I am unable to continue."

As a last commitment to the Canadian user, the company will be offering the 3.1 upgrades to Inscebot's TI-Base to those who have purchased the 2.04 version.

In addition, Laflamme notes, "We have stock from all companies we have represented to dispose of and there should be some great deals for the summer."

For information, contact Laflamme & Wrigley Wholesale, 5480 Canotek Rd., Unit 16, Gloucester, Ontario, Canada K1J 9H6; telephone, (613) 745-2225; Fax, (613) 744-4784; Delphi, JANELAFLAMME; Compuserve, 760446,2006.

TIGERCUB CATALOG OUT OF CATALOGS

Tigercub Software's catalogs are out of print and will not be reprinted because few orders are being received, according to Jim Peterson on the company. However, the catalog can be supplied on disk and he will continue to fill orders, he says.

Peterson says he is releasing all Tigercub software except the Nuts & Bolts disks for free distribution, with the stipulation that no price or copying fee may be charged without his permission. The Nuts & Bolts disks are reduced to $5 each; documentation will be supplied on disk if printed copies are exhausted.

Peterson has placed his Tigercub programs according to category in his TI-PD library, which now totals almost 400 disks, he says. These programs are included in his TI-PD catalog supplement No. 8, which is being mailed to all recent Tigercub customers and is available to all other purchasers of his catalog on request. TI-PD catalog No. 2 with supplement No. 8 is available for $1, refundable.

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

PENNSYLVANIA FAIR CHANGES DATE, PLACE

The Central PA 99/4A Users Group has changed the date and location of its Fourth Annual CPUG Computer/Electronics Exposition, according to Barry Long, secretary of the group.

The Expo will be held from 7 a.m. to 3:30 p.m. at the National Guard Armory in Palmdale, Pennsylvania. Long says the change was made because of scheduling conflicts. He says the new location will offer a larger floor area, greater parking facilities and a larger ""tailgating" area.

Preregistration will be accepted through Aug. 3. For information, write the Central PA 99/4A Users Group, P.O. Box 14126, Harrisburg, PA 17104-0126, or call Dave Ratcliffe, (717) 238-5414; Barry Long, (717) 564-2975; Anthony DeDonatis, (717) 534-2056; Terry Longenecker, (717) 838-7843; or the Data Factory BBS, (717) 657-4992 or 4997, 24 hours, 8-N-1, 300/1200/2400.

'ANIMATOR' RELEASED

Asgard Software has released The Animator by Brad Snyder, for generating animation sequences on the TI99/4A or the Geneve 9640.

The program includes two disks and a manual and requires 32K, Extended BASIC and one disk drive. A printer is recommended. Cost is $14.95.

For information, contact Asgard Software, P.O. Box 10306, Rockville, MD 20849, or (703) 255-3085.

BBS IN FORT WORTH AREA

The North East Texas 99ers operate a bulletin board with a 10 meg hard drive and 2400 baud 24 hours a day, 7E1, according to Lee W. DeForest of the group.

Phone number of the board is (817) 457-7043.

READER TO READER

Charles Lisby writes: I would like to know of a Mini-Memory assembly language program that would count the contact closures of one of the joysticks, for example the up contacts, and reset the count to zero when the fire contacts were closed and display this number as counts per second."

Write Lisby at 119 Brunswick Dr., Greenwood, IN 46143.

Dan Greenlee is looking for a Gram Kracker with disk and manual, as well as other TI equipment. Write him at 2435 E. North St., Box 341, Greenville, SC 29615, or call (803) 271-9232.

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

JOIN THE CHICAGO-AREA TI-99/4A USERS' GROUP

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Chicago, Illinois 60657

Hot Line: 708-869-4304

Feedback

GRAM devices still out there

I would like to take issue with some of your conclusions in "GROM boxes like keys to kingdom" (April 1990).

You simply did not do your homework when it came to CaDD Electronics and the Gramulator. You claim that the P-Gram card from Bud mills is "the only one of the four GRAM devices . . . that is still actively marketed." In fact, CaDD is still in the marketplace, so much so that the company has recently released an upgrade option for the Gramulator which allows a user to have up to 104K of GRAM and 20K of RAM in the device. This upgrade, known as the Alternate Gram Option, uses the "REVIEW MODULE LIBRARY" feature built into the TI console, and permits two or more cartridges to be loaded into the Gramulator and be accessed from the TI Master Selection List.

In addition, CaDD has developed a program that will convert GRAM files to and from TI GROM box format to Gramulator (also Gram Kracker) format, and to and from the Mechatronics GRAM Karte format — a device which you neglected to cover but which was probably more available than the Maximem.

It could be argued that your favoring of the P-Gram is because the manufacturer advertises in your magazine. For those who like to be spoonfed, the Gramulator is without quibble the best GRAM device available — based as it is on the genius of Craig Miller. No other Gram device can do all that the Gram Kracker could, and in addition allow for MBX cartridges, alternate GRAM and console GROMS 0, 1 and 2.

Without wanting to be too nasty, what kind of reporting is "Front panel includes switches to control the divice." We were always taught that dog bites man is not news. Now if the switches did not control the device . . . .

For the record, CaDD's address is 81 Prescott Rd., Raymond, NH 03077, telephone (603) 895-0119. They have an answering machine and they do return calls. CaDD's owner, Mark van Coppenolle, is a bright, friendly, knowledgeable individual who is willing to promote the cause of the TI community. Try him. You'll like him.

I could not agree more with Ollie Hebert (Feedback, April 1990). It has long been my lament that Chris Faherty never received his due in any Texaments advertising for TI-Artist and its upgrades. Chris Faherty is too valuable a programmer in this community to be denied the recognition he duly deserves.

It's also nice to see that Mr. Hebert is still active after being left alone at the helm of the South Mobile and Alabama User Group (SMAUG). Here was yet another case of a single individual who was expected to do it all with little or no support from those he was helping. This should be a lesson to all.

Terrie Masters
Beverly Hills, California

Book wanted

I'm still trying to decipher the assembly language. I have most of the books and several disks on the subject, but still the perspective eludes me.

I found an article by John Clulow in your February 1985 issue. He says learning this language requires a new approach to historic learning processes.

I'm for that. He recommended *Beginning Assembly Language for the TI Home Computer* by Ed York and Tim Inzana. However, the D&D Publishing Co. is no longer in Toledo, Ohio.

Where can I get a copy? I already have *Introduction to ...*, *Fundamentals of ...* and *Beginners Guide to Assembly Language.*

I'm somewhat familiar with BASIC but that doesn't seem to be enough. Any suggestions would be appreciated.

Bob Zink
Naples, Florida

Sometimes persons selling their systems include books — you might inquire if someone has this one, and if he would sell it separately. — Ed.

Poor editing?

It is unfortunate that MICROpendium editing is like some of my programs — less than perfect. In my article on checksums some things were left out or misstated. First, the checksum numbers were left off both programs. Second, the ASCII values are the values returned when using CALL KEY in the call key modes. Third, (my typo error) the second sentence of the paragraph after the freespace chart should read "For each 1k (1024 bytes) increase an additional page of memory is added."

In spite of the above, I think everyone would agree that MICROpendium is the best computer magazine being published today.

I think I as a Geneve owner, should respond to Mr. Brashear's letter "It's All Coming," (Feedback, May 1990) wherein he stated "Be advised that I am talking about the 99/4A, not the disaster-prone Geneve." The Geneve has had birthing pains and continues to have them, but Geneve owners, hold on to your hats, there is a breeze blowing. MYMENU, MYSCHEDULE, GRAPHIC DEMO PROGRAMS, TIDBITS and a remake of an old TI favorite, MYKENO , even a TIPS graphic viewer are all coming right here in MICROpendium. What this all means is that statements by a non-Geneve owner (I assume) must be taken with a grain of salt.

Jim Uzzell
Austin, Texas

***Feedback is a forum for TI99/4A and Geneve 9640 users. The editor will condense submissions when necessary. We ask readers to restrict themselves to one subject for the sake of simplicity. Mail Feedback items to* MICROpendium, P.O. Box 1343, Round Rock, TX 78680.**

USER GROUP UPDATE

These are additions and updates to our user group listings, begun in our May 1987 issue.

Kansas

Mid-America 99 Users Group, 8726 Marty Lane, Overland Park KS 66212 (new address).

Michigan

Great Lakes Computer Group Inc., P.O. Box 152, Roseville, MI 48066-0152 (new address).

BASIC

Learning to Read

By REGENA

The program this month requires the Speech Synthesizer and the Terminal Emulator 2 command module.

My little four-year-old has been able to identify and write the capital letters of the alphabet for some time now, but he still has difficulty with the lowercase letters. The program this month is designed to help him learn the lowercase letters and then to read three-letter words.

I have always taught my children to read with capital letters; then they seemed to learn the lowercase letters naturally and to be able to adjust to words printed in books. However, many educators now recommend that we begin teaching our children reading by using lowercase letters. This program uses lowercase letters that are the Roman style, the type of letters with serifs that are usually used in printed (typewritten) materials.

The TI Speech Synthesizer and the command module Terminal Emulator 2 are required for this program so that speech can be used. Hook the computer up with the Speech Synthesizer at the side. Put the Terminal Emulator 2 (TE 2) command module in. Press any key to start, then press 1 for TI BASIC. You may now program with speech capabilities. Remember that the TE 2 module allows you to use speech by spelling phonetically. The procedure within a program is to use an OPEN # statement first:

OPEN #1:"SPEECH", OUTPUT

Then you may use PRINT #1 to have the computer say something, such as

PRINT #1:"HELLO"

I usually use the "^" symbol to get a deeper voice:

PRINT #1:"^HELLO"

There are three main sections of this program. The first section shows the lowercase letter on the screen, and the computer says the letter. The child must then press the corresponding letter on the keyboard before the program will continue. After all 26 letters have been shown (in order), the complete alphabet is printed on the screen. The child presses any key to get back to the main menu screen.

The second section is a quiz for the child. A random letter is chosen. The child must press the corresponding letter on the keyboard. A quiz of 10 random letters is given, then the child may choose to have another quiz or to stop (go back to the main menu).

The third section is an introduction to reading by showing words that are three letters long. First the child chooses a middle vowel — a, e, i, o, u. Next the child chooses an ending letter. This choice varies depending on the vowel chosen. After the child chooses the second letter, which is the ending letter, a list of words with different starting letters is shown on the screen, and the computer says each word. The child may then practice reading the words. To continue, the child must press the ENTER key. To get back to the main menu screen, the child may press the ENTER key (represented by the yellow symbol) whenever a choice of letters is given.

Lines 220-390 define the graphic characters for the Roman lowercase letters. Most of the letters are actually made up of four characters, and some of the graphic characters are used in more than one letter to try to economize on memory. Letters with descending parts require another row. The letters "m" and "w" are three characters wide instead of two.

Line 400 opens the speech file. If you do not have the Speech Synthesizer and Terminal Emulator 2, you may delete all the lines that use the "#1 for speech.

Lines 410-510 contain the main menu screen and branching.

Lines 520-1850 are the subroutines to draw the lowercase letter depending on the value of L (which may be from 1 to 26 for the 26 letters of the alphabet). The subroutines draw the letter at a given ROW and COLumn.

Lines 1860-1950 show the lowercase letters one at a time and wait for the child to press the appropriate key. Lines 1960-2310 print the complete alphabet on the screen and wait until the child presses any key to return to the main menu screen.

The variable L is the number of the letter, and PRINT #1: "^" &CHR$(64+L) has the computer say the letter. LW is the width of the letter, which will be 2 or 3.

Lines 2320-2620 present the quiz of random letters.

Lines 2630-2800 define strings for letters used in the words the first time this third option is chosen. E$(T) each contain the possible ending letters for the five vowels. For example, E$(1) is "BDGNPRT". For the vowel "a", the first vowel, the letters in E$ are the possible ending letters that will be used in the words. Then, for each of those ending letters, the possible first letters of the words are in F$(T,E). For example, F$(2,1) is "BFLRW". The second vowel is "e" and the first ending letter is "d". The possible letters to start the word ending "ed" are b, f, l, r and w. The computer can then generate the words bed, fed, led, red and wed.

Lines 2810-2860 allow the child to choose the vowel. Lines 2870-2910 allow the child to choose the ending letter. Lines 2920-3190 print the words on the screen and say the words. CC is the column number used in COL. If there are too many words for one column, CC changes so a second column of words is started.

Lines 3200-3440 are the subroutine used in choosing a letter. Given a string such as "AEIOU", the program uses L=ASC(SEG$(N$,T,1))-64 to separate the string and print the appropriate lowercase letter. Lines 3360-3420 then determine which letter was pressed. Lines 3450-3460 end the program. (The program listing starts on the next page—Ed.)

If you wish to save typing effort, you may have a copy of this program by sending $4 to *REGENA, 918 Cedar Knolls West, Cedar City, UT 84720.* Be sure to specify that you need the TI version of "Learning to Read" and whether you want cassette or diskette.

REGENA ON BASIC—

```
100 REM LEARNING TO READ !04
1
110 REM BY REGENA !071
120 REM !186
130 REM REQUIRED:  !149
140 REM SPEECH SYNTHESIZER !
026
150 REM TERMINAL EMULATOR 2
!017
160 CALL CLEAR !209
170 PRINT TAB(4);"LEARNING T
O READ" !220
180 CALL CHAR(35,"183C7EFFFF
7E3C18")!126
190 PRINT :TAB(4);"LOWERCASE
 LETTERS": : :!074
200 CALL COLOR(1,12,1)!221
210 PRINT "THIS PROGRAM MAY
BE USED TO HELP A YOUNG CHIL
D LEARN THELOWERCASE ALPHABE
T." !135
220 FOR C=91 TO 151 !212
230 READ C$ !254
240 CALL CHAR(C,C$)!081
250 NEXT C !217
260 DATA 00000000000F1C18,00
00000000E0303,00030C18181808
07,30F03030303030EC !185
270 DATA 38181818181B1C18,00
00000000E03018,1818181818181
C1B,18181818181830E !006
280 DATA 0000000000070C18,18
18181818180C07,1800000000083
0C,3818181818D83818,18181818
181838DC !199
290 DATA 18181F1818180C07,18
18F800000830C !113
300 DATA 000103030303030F03,F0
9818000000C,0303030303030307
,000000000000008 !213
310 DATA 000000000CD03018,18
18180C0708100F,18181830E0000
08,070810100C03,F008080830C
!218
320 DATA 181818181818183C,00
03030000070303,0303030303030
303,6363261E !052
330 DATA 3818181818181818,00
00000000F0608,1B1E1918181818
3C,0000008040603078 !218
340 DATA 00000000003B1C18,00
00000000E33418,1818181818181
81F,0000000000DC3818,1818181
8181818F8 !223
350 DATA 0703030303030303,18
,0000000000E83818,181E070000
181C17,0000F018181830E !162
360 DATA 0000030303030F03,00
0000000000C,0303030303030301,0
0000000001090E,0000000000381
818 !248
370 DATA 00000000003C1818,00
000000001C0808,0C0C060603030
101,101020204040808,2C2C2646
43438181 !102
380 DATA 00000000003C180C,00
000000001C081,060301020408 10
38,204080C06030183C !151
390 DATA 01010202242418,0000
0000001F181,0000000000F8183,
00000103060C181F,60C08000000
818F8 !198
400 OPEN #1:"SPEECH",OUTPUT
!122
410 PRINT : :"CHOOSE:" !207
420 PRINT :"1  ALPHABET" !21
3
430 PRINT :"2  RANDOM LETTER
S" !159
440 PRINT :"3  WORDS" !034
450 PRINT :"4  END PROGRAM"
!169
460 CALL KEY(3,K,S)!190
470 IF (K<49)+(K>52)THEN 460
 !226
480 CALL CLEAR !209
490 ON K-48 GOSUB 1860,2320,
2630,3450 !221
500 CALL CLEAR !209
510 GOTO 410 !234
520 IF L>13 THEN 550 !095
530 ON L GOSUB 570,620,670,7
20,770,820,870,940,980,1020,
1060,1110,1150 !081
540 GOTO 560 !129
550 ON L-13 GOSUB 1210,1250,
1300,1360,1420,1470,1520,157
0,1610,1660,1730,1780,1810 !
039
560 RETURN !136
570 CALL HCHAR(ROW,COL,91)!1
73
580 CALL HCHAR(ROW,COL+1,92)
!105
590 CALL HCHAR(ROW+1,COL,93)
!106
600 CALL HCHAR(ROW+1,COL+1,9
4)!038
610 RETURN !136
620 CALL HCHAR(ROW,COL,95)!1
77
630 CALL HCHAR(ROW,COL+1,96)
!109
640 CALL HCHAR(ROW+1,COL,97)
!110
650 CALL HCHAR(ROW+1,COL+1,9
8)!042
660 RETURN !136
670 CALL HCHAR(ROW,COL,99)!1
81
680 CALL HCHAR(ROW,COL+1,96)
!109
690 CALL HCHAR(ROW+1,COL,100
)!144
700 CALL HCHAR(ROW+1,COL+1,1
01)!076
710 RETURN !136
720 CALL HCHAR(ROW,COL,99)!1
81
730 CALL HCHAR(ROW,COL+1,102
)!146
740 CALL HCHAR(ROW+1,COL,100
)!144
750 CALL HCHAR(ROW+1,COL+1,1
03)!078
760 RETURN !136
770 CALL HCHAR(ROW,COL,99)!1
81
780 CALL HCHAR(ROW,COL+1,96)
!109
790 CALL HCHAR(ROW+1,COL,104
)!148
800 CALL HCHAR(ROW+1,COL+1,1
05)!080
810 RETURN !136
820 CALL HCHAR(ROW,COL,106)!
219
830 CALL HCHAR(ROW,COL+1,107
)!151
840 CALL HCHAR(ROW+1,COL,108
)!152
850 CALL HCHAR(ROW+1,COL+1,1
09)!084
860 RETURN !136
870 CALL HCHAR(ROW,COL,99)!1
81
880 CALL HCHAR(ROW,COL+1,110
)!145
890 CALL HCHAR(ROW+1,COL,111
)!146
900 CALL HCHAR(ROW+1,COL+1,1
12)!078
910 CALL HCHAR(ROW+2,COL,113
)!149
920 CALL HCHAR(ROW+2,COL+1,1
14)!081
930 RETURN !136
```

(See Page 11)

REGENA ON BASIC—

(Continued from Page 10)

```
940 CALL HCHAR(ROW,COL,95)!1
77
950 CALL HCHAR(ROW,COL+1,96)
!109
960 CALL HCHAR(ROW+1,COL,115
,2)!068
970 RETURN !136
980 CALL HCHAR(ROW,COL,116)!
220
990 CALL HCHAR(ROW+1,COL,108
)!152
1000 CALL HCHAR(ROW+1,COL+1,
109)!084
1010 RETURN !136
1020 CALL HCHAR(ROW,COL,116)
!220
1030 CALL HCHAR(ROW+1,COL,11
7)!152
1040 CALL HCHAR(ROW+2,COL,11
8)!154
1050 RETURN !136
1060 CALL HCHAR(ROW,COL,119)
!223
1070 CALL HCHAR(ROW,COL+1,12
0)!146
1080 CALL HCHAR(ROW+1,COL,12
1)!147
1090 CALL HCHAR(ROW+1,COL+1,
122)!079
1100 RETURN !136
1110 CALL HCHAR(ROW,COL,128)
!223
1120 CALL HCHAR(ROW+1,COL,10
8)!152
1130 CALL HCHAR(ROW+1,COL+1,
109)!084
1140 RETURN !136
1150 CALL HCHAR(ROW,COL,123)
!218
1160 CALL HCHAR(ROW,COL+1,12
4)!150
1170 CALL HCHAR(ROW,COL+2,96
)!110
1180 CALL HCHAR(ROW+1,COL,11
5,3)!069
1190 LW=3 !093
1200 RETURN !136
1210 CALL HCHAR(ROW,COL,123)
!218
1220 CALL HCHAR(ROW,COL+1,96
)!109
1230 CALL HCHAR(ROW+1,COL,11
5,2)!068
1240 RETURN !136
1250 CALL HCHAR(ROW,COL,99)!
181
1260 CALL HCHAR(ROW,COL+1,96
)!109
1270 CALL HCHAR(ROW+1,COL,10
0)!144
1280 CALL HCHAR(ROW+1,COL+1,
98)!042
1290 RETURN !136
1300 CALL HCHAR(ROW,COL,123)
!218
1310 CALL HCHAR(ROW,COL+1,96
)!109
1320 CALL HCHAR(ROW+1,COL,12
5)!151
1330 CALL HCHAR(ROW+1,COL+1,
98)!042
1340 CALL HCHAR(ROW+2,COL,11
5)!151
1350 RETURN !136
1360 CALL HCHAR(ROW,COL,99)!
181
1370 CALL HCHAR(ROW,COL+1,12
6)!152
1380 CALL HCHAR(ROW+1,COL,10
0)!144
1390 CALL HCHAR(ROW+1,COL+1,
127)!084
1400 CALL HCHAR(ROW+2,COL+1,
115)!082
1410 RETURN !136
1420 CALL HCHAR(ROW,COL,123)
!218
1430 CALL HCHAR(ROW,COL+1,96
)!109
1440 CALL HCHAR(ROW+1,COL,11
5)!150
1450 CALL HCHAR(ROW+1,COL+1,
129)!086
1460 RETURN !136
1470 CALL HCHAR(ROW,COL,99)!
181
1480 CALL HCHAR(ROW,COL+1,13
0)!147
1490 CALL HCHAR(ROW+1,COL,13
1)!148
1500 CALL HCHAR(ROW+1,COL+1,
132)!080
1510 RETURN !136
1520 CALL HCHAR(ROW,COL,133)
!219
1530 CALL HCHAR(ROW,COL+1,13
4)!151
1540 CALL HCHAR(ROW+1,COL,13
5)!152
1550 CALL HCHAR(ROW+1,COL+1,
136)!084
1560 RETURN !136
1570 CALL HCHAR(ROW,COL,137,
2)!141
1580 CALL HCHAR(ROW+1,COL,10
0)!144
1590 CALL HCHAR(ROW+1,COL+1,
103)!078
1600 RETURN !136
1610 CALL HCHAR(ROW,COL,138)
!224
1620 CALL HCHAR(ROW,COL+1,13
9)!156
1630 CALL HCHAR(ROW+1,COL,14
0)!148
1640 CALL HCHAR(ROW+1,COL+1,
141)!080
1650 RETURN !136
1660 CALL HCHAR(ROW,COL,138,
2)!142
1670 CALL HCHAR(ROW,COL+2,13
9)!157
1680 CALL HCHAR(ROW+1,COL,14
0)!148
1690 CALL HCHAR(ROW+1,COL+1,
142)!081
1700 CALL HCHAR(ROW+1,COL+2,
141)!081
1710 LW=3 !093
1720 RETURN !136
1730 CALL HCHAR(ROW,COL,143)
!220
1740 CALL HCHAR(ROW,COL+1,14
4)!152
1750 CALL HCHAR(ROW+1,COL,14
5)!153
1760 CALL HCHAR(ROW+1,COL+1,
146)!085
1770 RETURN !136
1780 GOSUB 1610 !160
1790 CALL HCHAR(ROW+2,COL,14
7)!156
1800 RETURN !136
1810 CALL HCHAR(ROW,COL,148)
!225
1820 CALL HCHAR(ROW,COL+1,14
9)!157
1830 CALL HCHAR(ROW+1,COL,15
0)!149
1840 CALL HCHAR(ROW+1,COL+1,
151)!081
1850 RETURN !136
1860 PRINT "YOU WILL SEE A L
ETTER ON THESCREEN.  PRESS T
HE LETTER ONTHE KEYBOARD." !
242
```

(See Page 12)

REGENA ON BASIC—

(Continued from Page 11)

```
1870 ROW=10 !225
1880 COL=12 !201
1890 FOR L=1 TO 26 !115
1900 GOSUB 520 !090
1910 PRINT #1:"^"&CHR$(64+L)
!170
1920 CALL KEY(3,K,S)!190
1930 IF K<>64+L THEN 1920 !1
43
1940 CALL HCHAR(ROW,COL,32,9
6)!148
1950 NEXT L !226
1960 CALL CLEAR !209
1970 ROW=2 !177
1980 COL=4 !153
1990 FOR L=1 TO 7 !065
2000 PRINT #1:"^"&CHR$(64+L)
!170
2010 GOSUB 520 !090
2020 COL=COL+3 !055
2030 NEXT L !226
2040 ROW=6 !181
2050 COL=4 !153
2060 FOR L=8 TO 13 !118
2070 LW=2 !092
2080 PRINT #1:"^"&CHR$(64+L)
!170
2090 GOSUB 520 !090
2100 COL=COL+LW+1 !153
2110 NEXT L !226
2120 ROW=10 !225
2130 COL=4 !153
2140 FOR L=14 TO 20 !162
2150 LW=2 !092
2160 PRINT #1:"^"&CHR$(64+L)
!170
2170 GOSUB 520 !090
2180 COL=COL+LW+1 !153
2190 NEXT L !226
2200 ROW=14 !229
2210 COL=4 !153
2220 FOR L=21 TO 26 !166
2230 LW=2 !092
2240 PRINT #1:"^"&CHR$(64+L)
!170
2250 GOSUB 520 !090
2260 COL=COL+LW+1 !153
2270 NEXT L !226
2280 PRINT "PRESS ANY KEY.";
!241
2290 CALL KEY(3,K,S)!190
2300 IF S<1 THEN 2290 !003
2310 RETURN !136
2320 CALL CLEAR !209
2330 PRINT "PRESS THE LETTER
." !032
2340 ROW=10 !225
2350 COL=12 !201
2360 FOR T=1 TO 10 !116
2370 RANDOMIZE !149
2380 L=INT(26*RND+1)!205
2390 GOSUB 520 !090
2400 CALL KEY(3,K,S)!190
2410 IF S<1 THEN 2400 !114
2420 IF K=64+L THEN 2460 !23
6
2430 CALL SOUND(100,165,2)!1
32
2440 CALL SOUND(100,131,2)!1
25
2450 GOTO 2400 !184
2460 CALL SOUND(100,262,2)!1
30
2470 CALL SOUND(100,330,2)!1
26
2480 CALL SOUND(100,392,2)!1
34
2490 CALL SOUND(200,524,2)!1
32
2500 CALL SOUND(1,9999,30)!1
57
2510 PRINT #1:"^"&CHR$(64+L)
!170
2520 CALL HCHAR(ROW,COL,32,9
6)!148
2530 NEXT T !234
2540 CALL CLEAR !209
2550 PRINT "PRESS 1 FOR MORE
 LETTERS" !246
2560 PRINT "       2 TO STOP"
 !141
2570 PRINT #1:"^PRESS 1 FOR
MORE LETTERS." !048
2580 PRINT #1:"^PRESS 2 TO S
TOP." !180
2590 CALL KEY(3,K,S)!190
2600 IF K=49 THEN 2320 !086
2610 IF K<>50 THEN 2590 !030
2620 RETURN !136
2630 IF FLAG=1 THEN 2810 !21
1
2640 PRINT "ONE MOMENT PLEAS
E . . ." !016
2650 RESTORE 2690 !233
2660 FOR T=1 TO 5 !071
2670 READ E$(T)!193
2680 NEXT T !234
2690 DATA BDGNPRT,DNT,DGMNPT
,BDGNPT,BGNT !012
2700 FOR T=1 TO 5 !071
2710 FOR E=1 TO LEN(E$(T))!1
66
2720 READ F$(T,E)!186
2730 NEXT E !219
2740 NEXT T !234
2750 DATA CDGJLNT,BDFHLMPS,B
GLNRSTW,BCFMPRTV,CGLMNRSTZ,B
CFMPT,BCFHMPRSTV !033
2760 DATA BFLRW,DHMPT,BGJLMN
PSW !018
2770 DATA BDHKLMR,BDFPRW,DHR
V,BDFKPSTW,DHLNRSTZ,BFHKLPS
!207
2780 DATA BCLMRS,CNPRS,BCDFH
JL,STW,BCHLMPT,CDGHJLNPRT !0
22
2790 DATA CHRT,BDHJLMRT,BFNP
RS,BCJNR !165
2800 FLAG=1 !210
2810 CALL CLEAR !209
2820 N$="AEIOU" !111
2830 GOSUB 3200 !220
2840 IF K=13 THEN 3180 !172
2850 V$=CHR$(K)!198
2860 V=LL !172
2870 N$=E$(V)!092
2880 GOSUB 3200 !220
2890 IF K=13 THEN 3180 !172
2900 VE$=CHR$(K)!011
2910 E=LL !155
2920 N$=F$(V,E)!085
2930 ROW=1 !176
2940 CC=5 !066
2950 FOR T=1 TO LEN(N$)!253
2960 COL=CC !034
2970 LW=2 !092
2980 A=ASC(SEG$(N$,T,1))!179
2990 A$=CHR$(A)!167
3000 L=A-64 !065
3010 GOSUB 520 !090
3020 COL=COL+LW+1 !153
3030 L=ASC(V$)-64 !195
3040 GOSUB 520 !090
3050 COL=COL+3 !055
3060 L=ASC(VE$)-64 !008
3070 GOSUB 520 !090
3080 PRINT #1:"^"&A$&V$&VE$
!052
3090 ROW=ROW+3 !107
3100 IF ROW<22 THEN 3130 !04
0
3110 ROW=1 !176
3120 CC=20 !112
3130 NEXT T !234
3140 PRINT "PRESS #ENTER";!1
13
```

(See Page 13)

REGENA ON BASIC—

(Continued from Page 12)

```
3150 CALL KEY(3,K,S)!190
3160 IF K<>13 THEN 3150 !079
3170 GOTO 2810 !083
3180 CALL CLEAR !209
3190 RETURN !136
3200 CALL CLEAR !209
3210 PRINT "CHOOSE A LETTER.
" !179
3220 PRINT #1:"^CHOOZ UH LET
TER." !220
3230 ROW=10 !225
3240 COL=4 !153
3250 FOR T=1 TO LEN(N$)!253
3260 L=ASC(SEG$(N$,T,1))-64
!180
3270 LW=2 !092
3280 GOSUB 520 !090
3290 COL=COL+LW+1 !153
3300 NEXT T !234
3310 CALL HCHAR(11,26,35)!05
1
3320 CALL KEY(3,K,S)!190
3330 IF S<1 THEN 3320 !013
3340 IF K=13 THEN 3440 !177
3350 IF (K<65)+(K>90)THEN 33
20 !025
3360 FOR T=1 TO LEN(N$)!253
3370 IF K=ASC(SEG$(N$,T,1))T
HEN 3420 !035
3380 NEXT T !234
3390 CALL SOUND(100,165,2)!1
32
3400 CALL SOUND(100,131,2)!1
25
3410 GOTO 3320 !083
3420 LL=T !170
3430 CALL CLEAR !209
3440 RETURN !136
3450 CLOSE #1 !151
3460 END !139
```

Traver releases Coney Games

Barry Traver has released a disk, Coney Games, which come from the first two volumes of his TI magazine on disk, the Genial TRAVelER.

The eight games include 31/CARDS, 31/DICE and 31/STICKS (three variations of the "31" game); GALE/GAME (also known as BRIDG-IT); NIMROW; PENNEYTOSS; SHUTOUT; and TIC-TAC/PHI (Tic-Tac-Toe, Philadelphia style). The games pit a single player against the computer or by two competing players (except TICTAC/PHI).

The Coney Games disk is available for $10 from Barry Traver, 835 Green Valley Dr., Philadelphia, PA 19128. Phone is (215) 483-1379.

KBCC releases YALP!

KBCC has released YALP! (Yet Another Lotto Program, described as "loaded with features that allow you to approach the lottery with a serious, proven strategy for winning big!"

YALP! requires Extended BASIC and is available on cassette or disk for $6.

Phrase Disk 3: Challenge Words containing 120 single-word puzzles, described as very difficult puzzles designed for advanced players, is available for $4.

KBCC has reduced prices on Spinner, Memory Motel and Quizzard, $6 each, and Spinner Phrase Disks, $4.

For a catalog, write KBCC, 653 Fair Ave. N.W., New Philadelphia, OH 44663.

1990 TI FAIRS

FEBRUARY

TI-Fest West '90, Feb. 17-18, Day's Inn, 88 E. Broadway, Tucson, Arizona. Sponsored by Southwest 99ers. For information, call (602) 747-5046 or the Cactus Patch BBS, (602) 795-1953, check GEnie or write P.O. Box 17831, Tuscon, AZ 85730. For room reservations, call (602) 622-4000 by Jan. 16 and mention Fest-West.

MARCH

West Coast Computer Fair, 10 a.m.-6 p.m. March 1-4, Brooks Hall/Civic Center, San Francisco, California. San Francisco 99ers at Booth 1960. Fee $10 per day, discounts for multiple days. Call Neil Wood, (707) 425-3854.

TICOFF (TI Computer Owners' Fun Faire — The IBM & Clone Owners' Fun Faire, 9:30 a.m.-4 p.m. March 17, Roselle Park, New Jersey. For information, call (201) 241-4550 or the TICOFF BBS (201) 241-8902.

APRIL

Canadian TI-FEST, April 28, Merivale High School, Nepean, Ontario, Canada. For information, contact Ruth O'Neill, 34 McLeod St., Ottawa, Ontario, Canada K2P 0Z5 or (613) 234-8050 or CompuServe 72117,3541 or Delphi REON.

MAY

Boston Computer Society Home Computer Fair, 10 a.m.-4 p.m. May 5, cafeteria, Waltham Central Middle School, 55 School St., Waltham, Massachusetts. Contact Justin Dowling, The Boston Computer Society, TI99 User Group, One Center Plaza, Boston, MA 02108.

Alberta TI Orphan Reunion, 10 a.m.-5 p.m. May 12, Innisfail Lions Hall, Innisfail, Alberta, Canada. Contact Fred Kessler, Box 20, Sundre, Alberta, Canada T0M 1X0. Phone: (403) 638-3916.

TI Multi User Group Conference, 9 a.m.-6 p.m. May 26, Reed Hall/Student Activities Building, Ohio State University Lima Campus. For information write Lima Ohio User Group, P.O. Box 647, Venedocia, OH 45894, or call Dave Szippl evenings (419) 228-7109.

Annual Meet of TI99/4A Users Group UK, May 26, North Gate Arena, Chester, England. Contact Stephen Shaw, 10 Alstone Rd., Stockport, Cheshire, England SK4 5AH.

SEPTEMBER

Seattle TI Convention, Sept. 22. Call Queen Anne Computer Shoppe TIBBS, (206) 546-1865.

OCTOBER

Fourth Annual CPUG Computer/Electronics Exposition, 7 a.m.-3:30 p.m. Oct. 7, National Guard Armory, Palmdale, Pennsylvania. Preregistration through Aug. 3. Write Central PA 99/4A Users Group, P.O. Box 14126, Harrisburg, PA 17104-0126 or call Dave Ratcliffe (717) 238-5414 or The Data Factory BBS (717) 657-4992 or 4997 (24 hours 8-N-1 300/240.

Columbia Northwest TI Computer Fair, Oct. 27-28, Jantzen Beach Red Lion Inn, Portland, Oregon. Sponsored by NOVA (Ninety-Niners Of the Vancouver Area), Washington, and PUNN (Portland Users of Ninety-Nines), Oregon. Contact N. Michal Calkins, 1215 S.W. Cedar St., Lake Oswego, OR 97034, or (503) 636-1839.

NOVEMBER

Chicago TI Faire, Nov. 2-3. Write Chicago TI Users Group, P.O. Box 578341, Chicago, IL 60657.

This TI event listing is a permanent feature of MICROpendium. User groups and others planning events for TI/Geneve users may send information for inclusion in this standing column. Send information to: MICROpendium Fairs, P.O. Box 1343, Round Rock, TX 78680.

EXTENDED BASIC

A DOS-like directory program for the TI

By JERRY STERN

©1990 J.L. Stern

Last month, we listed conversions of commands from other versions of BASIC. This month, we'll emulate the MS-DOS DIR command. This is not a translation. A true translation would be written in assembly code, and would copy the features of the command exactly. DIR is only a functional copy, and I've taken some poetic license during the conversion.

The DIR command in DOS lists files by name, extension, size, and date. "Wildcard" characters allow only files with certain names or extensions, or certain characters in a name or an extension, to be listed. Switches, like /W, create a display of file names only, but listed across the screen in columns. The /P switch creates a "paged" output, showing only one screen at a time of file names.

Those options are useful. Sometimes we are only looking for the text files, with extensions of .TXT or .DOC, or the .EXE program files. On our TI 99/4As, those would be Display/Variable 80, or Program format files. Our file types can be treated as DOS extensions. Instead of an unlimited number of extensions, that allows us just five, Display/Variable, Display/Fixed, Internal/Variable, Internal/Fixed, and Program.

The switches for Wide output, or Paged output, are usable on a TI, probably even essential because of the 28-column screen. Another switch would be both useful and easy to add; an option for creating Hardcopy will send a printed directory to the default printer, and the switch will be the letter H.

Wildcard searches could be a problem. The DOS implementation of DIR allows question marks to represent any single character, or asterisks to stand for any string of characters. Although that could be done in TI Extended BASIC, it would involve several lines of code, and that code would be executed for every file in the disk directory. A simpler method would speed up the processing: The TI POS command can search a string for another string, and report back on the position of the string, or the lack of that search string. Using POS would result in a different search pattern from that of DOS: The DOS search FR*.* would list all files beginning with FR, but in the TI version, using POS, F will list all the files containing FR anywhere in the file name.

While it might be useful to emulate the wildcard methods of MS-DOS, saving a few lines of code inside a loop is more practical. A directory utility to be run from within TI Extended BASIC must be faster than the process of leaving BASIC, loading an assembly-based utility program like DM-1000, reading the directory, leaving the utility, and returning to BASIC. Adding those extra lines of code would slow down the program too much.

A full-screen display would also slow down the program. The fastest way to run a program is to use only one prompted input, and simply scroll the results up the screen. Yes, the DISPLAY AT statement is slightly faster if no calculations are needed and no disk access will be needed between lines. Neither of those conditions will be true for this application.

While it might be useful to emulate the wildcard methods of MS-DOS, saving a few lines of code inside a loop is more practical.

Using a single line for input could be very limiting. The INPUT statement in TI Extended BASIC cannot load a varied number of options from one INPUT statement. However, last month we used the subprogram MINPUT to recreate the MAT INPUT statement of DECsystem-10 BASIC. That subprogram uses the LINPUT statement, and some string manipulation, to accept up to ten different numbers as input variables. A variation on that technique will work in DIR. MINPUT2 is a subprogram that returns up to ten string variables in an array. DIR only needs the first four variables, and these will be the drive number, filename string for searching, file type by number, and switches. An unneeded option can be skipped by adding an extra comma.

DIR can't be run on a TI by simply typing DIR and the options, like we would on a PC. Instead, load and run the program with the command, "RUN DSK1.DIR" DIR will respond with a five-line prompt

```
DIR 1,*,*,P
Drive, Name, Type, Options
1:DF 2:DV 3:IF 4:IV 5:PROG.
P paged, W wide, H hardcopy
?
```

Here are some sample responses to the prompt, and how MINPUT2 will interpret them. DIR will substitute the default values shown in the first line of the prompt.

1,*,*,P

This will display all the files on the disk in drive 1, shown one screen at a time. However, since the default is shown in the prompt and set for drive one, all file names, all file types, and Paged output, just pressing ENTER by itself would produce exactly the same results.

2,FR

This will display on screen all the files on drive 2 containing the string FR in their file names, one screen at a time.

2

Displays all the files on drive 2, one screen at a time.

3,,H

Prints a listing on the printer of all the files on drive 3.

2,,5

Displays all the PROGRAM files found on disk 2.

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TIMP,,,WH

Prints, in two-column Wide format, all the files on the disk named TIMP. If you enter a diskname instead of a drive number, the diskname must start with a period.

The defaults are important in DIR. Because they can be changed, your current defaults are always displayed on the first line of the prompt. In line numbers 130 and 140, you can set these defaults to suit your own system. PR$ must be the name of your printer. D$(1) is the default drive number or drive name, IN QUOTES. All the defaults are string variables, and need quotes. D$(2) is the default search string. If you change this string to anything except "*", or " ", or "", DIR will always search for just those file names satisfying that search string, unless you type in a replacement at the prompt. I recommend leaving the default for D$(2) unchanged. D$(3) is the default file type, using the same numbers as the command prompt. A "5" here would cause DIR to display only program files, or "2" would show only Display/Variable files. D$(4) must be a combination of the letters W, P, or H, in capital letters. "WH" would choose a two-column printout as default, or "PW" would display the directory one screen at a time, in two columns. Either in the default, or on the command line, "P" is ignored when "H" is present, just to avoid a silly printout with "Press any key to continue" printed after every 23rd line.

DIR can read a directory using a method published by TI in the manual to the Disk Memory System #PHP-1240, which we call the Disk Drive Controller Card. I've used the same variable names and order of steps in DIR, but the program is more complex because each of the extra options requires extra lines of code. Some lines are skipped when some options are turned on, and other lines may be skipped for other options. Rather than lengthen the program with code that is simpler, but duplicated, I've inserted jumps past lines that aren't needed under certain option choices.

For example, if Hardcopy is selected, line 290 opens a file for the printer, and line 530 closes that file. No other lines had to be changed, because there is a trick to choosing file numbers. When a file number is zero, the file is automatically the screen, and no OPEN or CLOSE statements are needed. Any other file number must be OPENed, defined, and CLOSEd. Line 290 changes the file number to two for the printer, or zero for the screen. This technique could be used another way. A program could place a print routine in a loop, using a variable to print first to device #0, the screen, then to #1, a printer, and finally to #2, a Display/Variable 80 disk file. The OPEN and CLOSE statements must be outside the loop for this method to run.

The disk directory on a TI disk can be opened like any other file. That file, unlike any other, has no file name. It is opened as an internal format file, in relative format. The input option prevents the program from writing to the directory, and destroying data.

The disk directory on a TI disk can be opened like any other file. That file, unlike any other, has no file name. It is opened as an internal format file, in relative format. The input option prevents the program from writing to the directory, and destroying data.

OPEN #5:"DSK [drive number] .",INPUT , RELATIVE, INTERNAL

The first record in the file contains the disk name, the number of sectors formatted on the disk, and the number of sectors available to use. Each of the records that follows is the filename information for one file. Each record consists of the filename, the file type by number, the size of the file, and the record length (in bytes) for that file. For example, the record length for a text file is 80, or 163 for a merge format subprogram. A protected program is indicated by a negative number for the file type.

Although these records are in alphabetical order, the actual files are in random order on the disk. Each time a file is edited and written back to the disk, the old file it replaces is deleted, and the new file replaces it. When a file is saved to a blank disk, the file is saved in one block of data starting at the beginning of the disk, immediately after the directory. A second file would be saved right after the first. At this point, if the first file were to be edited, made longer, and saved again, the file would be stored in the space it originally occupied, plus a second block of space after the second file.

This splitting process is called fragmentation. The disk controller keeps track of the placement of the fractured pieces of the files on each disk, and we will not usually notice that the files have been split. When disk access slows down, we may suspect that the files are fractured. The fractured files on a disk may be restored to unbroken form by copying the disk in file by file format. Most of the sector-copying "fast" copiers keep the files fragmented as they were on the original disk. TI Disk Manager II can do a file by file copy, as can Disk Manager 1000, or Mike Dodd's M-Copier.

There are several possible errors that can occur when reading disk files. The program will crash if the drive door is open, or if the disk drive number does not represent a real drive. It is possible to control these errors using ON ERROR statements. I have used these statements in the MINPUT2 subprogram to prevent a crash caused by bad input at the prompt, but the error instructions are reset to STOP before the subprogram returns program control to the main program in lines 28740 or 28775. Input errors are easily controlled and corrected, but drive errors must be fixed by the program operator.

The amount of program code needed to catch all the possible drive errors would

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be excessively large. On a program like DIR, where there is no data stored in memory, there is no advantage to using large error trapping routines to prevent crashes. It is far more practical to let TI Extended BASIC provide the error messages if any are needed.

Here are the possible error messages.

I/O ERROR 07 IN 300: The program is trying to open a drive using a diskname that is not available.

I/O ERROR 26 in 310: The drive door may be open, or the disk unformatted, or the drive number doesn't exist, or there is no disk in the drive.

I/O ERROR 26 in 360: Trying to read a double-sided disk in a single-sided drive.

Obviously, these errors might never occur; they are all fairly simple problems. DIR should help prevent other errors, like writing over old files, or trying to load a file from the wrong disk.

DIR's emulation of a command from another computer system is a good example of what happens in these translations. In adapting the command to fit the language and hardware available, some compromises are made, some improvements are added, and some features are converted to suit different needs. The result is a program is custom fit for the TI 99/4A.

DIR

```
100 ! DIR !130
110 ! MS-DOS DIR STATEMENT E
MULATION  JLS 6/90 !015
120 ! DEFAULT PRINTER AND SE
ARCH STRINGS, OPTIONS !119
130 PR$="RS232.DA=8.BA=9600.
PA=N.LF" !144
140 D$(1)="1" :: D$(2)="*" :
: D$(3)="*" :: D$(4)="P" !18
1
150 T$(1)="DIS/FIX" :: T$(2)
="DIS/VAR" :: T$(3)="INT/FIX
" !055
160 T$(4)="INT/VAR" :: T$(5)
="PROGRAM" !122
170 PRINT "DIR ";D$(1);",";D
$(2);",";D$(3);",";D$(4)!112
180 PRINT "Drive, Name, Type
, Options" !106
190 PRINT "1:DF 2:DV 3:IF 4:
IV 5:PROG." !215
200 PRINT "P paged, W wide,
H hardcopy" !105
210 CALL MINPUT2("",N,P$())!
068
220 FOR L=1 TO 4 !062
230 IF P$(L)="" THEN P$(L)=D
$(L)!242
240 NEXT L !226
250 W=-SGN(POS(P$(4),"W",1))
!184
260 H=-SGN(POS(P$(4),"H",1))
!154
270 IF H THEN P=0 ELSE P=-SG
N(POS(P$(4),"P",1))!174
280 IF (P$(3)="")OR(P$(3)="*
")THEN TY=0 ELSE TY=VAL(P$(3
))!043
290 IF H=0 THEN S=0 ELSE S=2
 :: OPEN #2:PR$,DISPLAY ,VAR
IABLE 80,OUTPUT !053
300 OPEN #5:"DSK"&P$(1)&".",
INPUT ,RELATIVE,INTERNAL !20
8
310 INPUT #5:A$,J,J,K !159
320 PRINT #S:"DSK   DISKNAME
=";A$:"AVAILABLE=";K;"USED="
;J-K !151
330 IF W THEN PRINT #S:"File
name       Filename":"_____
___  _____" :: GOTO 3
50 !187
340 PRINT #S:"FILENAME   SIZ
E TYPE       P":"_________
_____ _____ _" !049
350 FOR L=1 TO 127 !166
360 INPUT #5:A$,A,J,K !150
370 IF LEN(A$)=0 THEN 520 !1
01
380 IF (P$(2)="*")OR(P$(2)="
")THEN 400 !015
390 IF POS(A$,P$(2),1)=0 THE
N 510 !154
400 IF (TY>0)AND(ABS(A)<>TY)
THEN 510 !156
410 T=CNT+3 :: IF P AND(T-IN
T(T/23)*23=0)THEN IF W THEN
PRINT #S :: CALL PAUSE ELSE
CALL PAUSE !110
420 CNT=CNT+1+.5*W !075
430 T=CNT-.5 :: IF W THEN PR
INT #S:TAB(1+(T-INT(T))*28);
A$;:: GOTO 510 !095
440 PRINT #S:A$;TAB(12);J;TA
B(17);T$(ABS(A));!099
450 IF ABS(A)=5 THEN 480 !01
9
460 B$=" "&STR$(K)!087
470 PRINT #S:SEG$(B$,LEN(B$)
-2,3);!199
480 IF A>0 THEN 500 !236
490 PRINT #S:TAB(28);"P";!19
0
500 PRINT #S !236
510 NEXT L !226
520 CLOSE #5 :: IF H THEN CL
OSE #2 !049
28730 SUB MINPUT2(A$,N,X$())
!238
28735 ! MINPUT2(PROMPT,NUMBE
R OF INPUTS RETURNED,STRING
ARRAY OF INPUTS) !117
28740 ON ERROR 28780 :: CALL
 KEY(3,K,S):: LINPUT A$:Y$ :
: N=1 :: P1=0 :: IF Y$="" TH
EN N=0 :: ON ERROR STOP :: S
UBEXIT !106
28745 IF SEG$(Y$,LEN(Y$),1)=
CHR$(32)THEN Y$=SEG$(Y$,1,LE
N(Y$)-1):: GOTO 28745 !167
28750 P2=POS(Y$,",",P1+1)::
IF P2=0 THEN 28765 !030
28755 IF P2-P1=1 THEN X$(N)=
"" :: N=N+1 :: P1=P2 :: GOTO
 28750 !214
28760 X$(N)=SEG$(Y$,P1+1,P2-
P1-1):: N=N+1 :: P1=P2 :: GO
TO 28750 !067
28765 IF P1=LEN(Y$)THEN X$(N
)="" :: GOTO 28775 !150
28770 X$(N)=SEG$(Y$,P1+1,LEN
(Y$)-P1)!091
28775 ON ERROR STOP :: SUBEX
IT !001
28780 CALL SOUND(90,-1,0)::
CALL SOUND(400,-3,0):: RETUR
N 28740 !147
28785 SUBEND !168
30820 SUB PAUSE !236
30825 FOR D=1 TO 100 :: NEXT
 D !241
30830 DISPLAY AT(24,1):" PRE
SS ANY KEY TO CONTINUE" !120
30835 CALL KEY(0,K,S):: IF S
<1 THEN 30835 !049
30840 SUBEND !168
```

MY-BASIC

MY-MENU lets you display files, load and run programs

By JIM UZZELL
©1990 DDI Software

MY-MENU is a new MY-BASIC program that creates a load and run menu from the files on your disk.

MY-MENU autoloads if it is on the same disk as MY-BASIC and is named LOAD. You can run any program on your disk or view on screen Display, Internal files or print files to your printer.

MY-MENU also supports Myarc Hard & Floppy Disk Controller subdirectory files for floppies. Yes, you can run programs from your subdirectories. MY-MENU does not support RAMdisk or hard drives directly, but can be used to run programs from these devices through the use of batch-type files. For example, you could access such programs on a disk by using dummy file names for batch files:

100 RUN "HDS1.DIRECTORY.PATHNAME"

or

100 RUN "DSK5.FILENAME"

You would then select the program you wish to run from the menu displayed by MY-MENU.

However, MY-MENU does not support programs saved in merge format.

MY-MENU can handle up to 508 files (includes subdirectories) or the capacity of the disk, whichever comes first.

Here are MY-MENU commands:

1. Print Catalog
2. Page Up
3. Page Down
4. Change Drive
5. Stop

Here are Sub-Menu commands:

(T)ext on printer
(F)ile on printer
(S)creen
(Z) Aborts
Spacebar — pauses screen

If you plan to use MY-MENU on a hard disk, the following is one way to autorun MY-MENU from MDOS:

MB=DIRECTORY
XXX=MEMORY ALLOCATION
E·Ω/MB.BASIC1 XXX/MB.LOAD

The above assumes that MY-BASIC files and LOAD (MY-MENU) are in the MY-BASIC directory. Do not install LOAD in a DSK1 directory if you expect to use TI Extended BASIC.

Use of this program requires MY-BASIC Version 2.99A and MDOS 1.14F or 0.97h . It will not work with MY-BASIC 2.99. For a copy of 2.99A, 1.14F and 0.97h, send $5 to MICROpendium MBASIC, P.O. Box 1343, Round Rock, TX 78680. (Specify disk format.)

Because the HFDC disk manager (V1.29) is not complete, do not use the Move command or Copy command to transfer files from directory to directory on the same floppy disk.

Readers should be using Myarc HDOS V0.96 or V0.97 and MY-BASIC V2.99 or V2.99A when using programs from this column—Ed.

MY-MENU

```
100 CALL GRAPHICS(3,3) !2-22
-90
110 !VERSION HFDC-F
120 ! LOAD MENU FOR HFDC FLO
PPIES
130 ! (C)1990 By DDI SOFTWAR
E    2004B LEEANN    AUSTIN,
 TX 78758
140 D$="12" :: P$="PIO" :: F
$="DSK1."
150 CALL CHAR(126,"C0A0D8141
8E040E0")
160 ON ERROR 800 :: GOTO 180
 :: DIM Z$(127) :: DIM G(127
),Y(127) :: DIM A$(127)
170 X$=0 :: D$=0
180 CALL MARGINS(1,39,1,23)
190 @=1 :: DISPLAY ERASE ALL
 :: Y$="<Z> Aborts" :: ON ER
ROR 810 :: OPEN #@:F$,INPUT
,RELATIVE,INTERNAL :: L,A,D=
0 :: INPUT #@:A$(D),G(D),X,Y
(D) :: A$(D)=F$&A$(D)&"." ::
 DIR$=F$ :: DIR1$=A$(D)
200 MZ=X
210 DISPLAY AT(5,17):"MYMENU
"; :: D$=0
220 DISPLAY AT(7,12):"MYBASI
C   MENU "; :: DISPLAY AT(9,
1):"       Press any key to
interrupt";: :TAB(16-LEN(A$(
D))/2);"Scanning ";A$(D);
230 D=D+@ :: INPUT #@:A$(D),
G(D),C,Y(D) :: IF A$(D)="" T
HEN 290 ELSE A=A+C :: B$=STR
$(C) :: CC$=B$ :: C=ABS(G(D)
) :: AA=A
240 IF C=6 THEN B$=""
250 B$=A$(D)&RPT$(" ",14-LEN
(A$(D))-LEN(B$))&B$
260 B$=B$&" "&SEG$(" DisFix
DisVar IntFix IntVar Progrm
SubDir",7*C-6,7-(C=5)) :: DI
R=C :: IF C<5 THEN B$=B$&STR
$(Y(D))
270 IF DIR=6 THEN A=A-256
280 Z$(D)=B$&RPT$(" ",26-LEN
(B$))&SEG$("PU",@-(G(D)>0),@
) :: DISPLAY AT(15,8):Z$(D)
:: A$(D)=F$&A$(D) :: CALL KE
Y(3,I,B) :: IF B<@ THEN 230
ELSE S,D=D+@
290 CLOSE #@ :: D=D-@ :: P=I
```

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MY-MENU—

(Continued from Page 17)

```
NT(D/16+.99) :: X=X-Y(Ø)
3ØØ CALL TCOLOR(4,7) :: IF X
S=2 THEN X=A
31Ø IF DS=1 THEN 33Ø :: GOSU
B 1Ø1Ø
32Ø CALL MARGINS(4Ø,8Ø,1,24)
33Ø DISPLAY AT(Ø,2)ERASE ALL
 :A$(Ø);TAB(25);" Page";L+@
;"of ";STR$(P):"      Free";
Y(Ø);"      Used";X:"     Fi
lename     Size    Type"; ::
CALL TCOLOR(2,15) :: IF DIR<
6 THEN 36Ø
34Ø DISPLAY AT(2,34)BEEP :A;
 :: FOR C=@ TO 1Ø :: DISPLAY
 AT(2,33)SIZE(@):CHR$(126) :
: CALL SOUND(-99,11Ø,Ø,-4,Ø)
 :: NEXT C
35Ø CALL TCOLOR(2,15)
36Ø IF D THEN DISPLAY AT(@,3
2)SIZE(@):STR$(L+@); ELSE DI
SPLAY AT(13,8):"No files thi
s disk/directory"; :: M=Ø ::
 GOTO 4ØØ
37Ø M=16+(L+@=P)*(16*P-D) ::
 FOR C=@ TO M :: CALL HCHAR(
C+3,45,32,31) :: DISPLAY AT(
C+3,6):CHR$(C+64);" ";Z$(C+1
6*L); :: NEXT C
38Ø IF M<16 THEN 39Ø ELSE 4Ø
Ø
39Ø FOR C=M+1 TO 16 :: CALL
HCHAR(C+3,45,32,31) :: NEXT
C
4ØØ CALL TCOLOR(2,16) :: DIS
PLAY AT(21,1):"      <1>Prin
t Catalog <2>Page Up   ";"
 <3>Page Down <4>Change Driv
e <5>Stop      "; :: DISPLAY
AT(23,1):RPT$(" ",41);
41Ø IF SX=2 THEN CALL TCOLOR
(16,2) :: DISPLAY AT(23,17):
"<R>oot"&" ";
42Ø CALL TCOLOR(7,16) :: DIS
PLAY AT(22,33)INVERT :"<5>St
op "; :: CALL TCOLOR(16,5)
43Ø CALL DRAW(1,1,496,184,49
6) :: CALL DRAW(1,184,251,18
4,495) :: CALL DCOLOR(7,7) :
: CALL DRAW(1,25,289,152,289
) :: CALL DCOLOR(4,5)
44Ø GOSUB 68Ø :: IF E=49 THE
N 63Ø :: IF E=5Ø THEN L=MIN(
L+@,P-@) :: GOTO 35Ø ELSE IF
 E=51 THEN L=MAX(L-@,Ø) :: G
OTO 35Ø ELSE IF E=52 THEN 65
Ø :: IF E=53 THEN CLS :: GOT
O 1ØØØ ELSE IF E<65 OR E>64+
M THEN 45Ø
45Ø IF E=82 THEN XS=Ø :: SX=
Ø :: GOTO 18Ø ELSE IF E>64+M
 THEN 44Ø
46Ø CALL TCOLOR(2,16)
47Ø A=E+L*16-64 :: F=ABS(G(A
)) :: IF F=6 THEN 96Ø :: IF
F=5 OR (F=4 AND Y(A)=254) TH
EN 89Ø :: DISPLAY AT(21,1):"
     Print ";A$(A):"      <T>
ext on Printer ";Y$:"      <F
>ile on Printer <S>creen"
48Ø CALL TCOLOR(16,5)
49Ø GOSUB 68Ø :: IF E=9Ø THE
N 4ØØ :: IF E<>7Ø AND E<>83
AND E<>84 THEN 49Ø :: C=-(E=
7Ø)-2*(E=84) :: IF C THEN ON
 ERROR 83Ø :: OPEN #@:P$ ::
DISPLAY AT(21,6):"Printing "
;A$(A):TAB(12);Y$: : ELSE DI
SPLAY ERASE ALL :: PRINT A$(
A): :
5ØØ ON ERROR 84Ø
51Ø IF F>2 THEN 56Ø ELSE IF
F=@ THEN OPEN #2:A$(A),INPUT
 ,FIXED ELSE OPEN #2:A$(A),I
NPUT
52Ø IF EOF(2)=Ø AND E<>9Ø TH
EN LINPUT#2:B$ :: GOSUB 74Ø
:: GOTO 52Ø
53Ø CLOSE #2 :: IF C THEN CL
OSE #@ :: GOTO 4ØØ ELSE PRIN
T : : :: IF DIR<6 THEN A=X E
LSE A=(AA-256)
54Ø DS=1 :: IF E=9Ø THEN 3ØØ
55Ø DS=1 :: GOSUB 69Ø :: GOT
O 3ØØ
56Ø IF F=3 THEN OPEN #2:A$(A
),INPUT ,INTERNAL,FIXED ELSE
 OPEN #2:A$(A),INPUT ,INTERN
AL
57Ø IF EOF(2) OR E=9Ø THEN 5
3Ø :: INPUT #2:B$ :: IF LEN(
B$)<>8 THEN 62Ø :: A=2*ASC(B
$) :: B=ASC(SEG$(B$,2,@)) ::
 IF A=Ø AND B=Ø THEN B$="Ø"
:: GOTO 62Ø
58Ø IF (A<255 AND B>99) OR (
A>255 AND B<157) THEN 62Ø
59Ø E=Ø :: FOR I=3 TO 8 :: F
=ASC(SEG$(B$,I,@))
6ØØ IF F>99 OR (I>5 AND (F>3
1 AND F<127)) THEN 62Ø
61Ø E=E+F*1Ø^(4-2*I) :: NEXT
 I :: IF B<1ØØ THEN B$=STR$(
(B+E)*1Ø^(A-128)) ELSE B$=ST
R$((B-256-E)*1Ø^(382-A))
62Ø GOSUB 74Ø :: GOTO 57Ø
63Ø ON ERROR 83Ø :: OPEN #@:
P$ :: DISPLAY AT(21,@):"Prin
ting disk catalog"
64Ø PRINT #@:"Disk:  ";SEG$(
A$(Ø),6,1Ø):"Free: ";Y(Ø);"*
 Used: ";X:"FILENAME  SIZE T
YPE":RPT$("-",28) :: FOR I=@
 TO D :: PRINT #@:Z$(I) :: N
EXT I :: CLOSE #@ :: GOTO 4Ø
Ø
65Ø A=LEN(D$) :: B=VAL(SEG$(
F$,4,@)) :: A=B+@+A*(B=A) ::
 DIR=Ø
66Ø DISPLAY AT(24,15):"Drive
:  ";A;
67Ø ACCEPT AT(24,24)VALIDATE
(D$)SIZE(-@)BEEP :F$ :: IF F
$="" THEN 66Ø ELSE F$="DSK"&
F$&"." :: IF DIR=6 THEN 96Ø
ELSE 18Ø
68Ø B$="  Press your choice"
 :: GOTO 7ØØ
69Ø B$=" Press any key to co
ntinue"
7ØØ DISPLAY AT(24,@):B$ :: F
OR I=@ TO 18 :: CALL KEY(4,E
,B)
71Ø IF B=@ THEN DISPLAY AT(2
4,@) :: RETURN
72Ø CALL TCOLOR(16,7) :: DIS
PLAY AT(24,71):" TIME ";SEG$
(TIME$ ,1,5)&" "; :: CALL TC
OLOR(16,5) :: NEXT I
73Ø DISPLAY AT(24,@) :: FOR
I=@ TO 25 :: NEXT I :: GOTO
7ØØ
74Ø IF C=Ø THEN PRINT B$ ::
CALL KEY(3,A,B)
75Ø IF B=Ø THEN RETURN ELSE
PRINT :: B$="Any key continu
es "&Y$ :: GOTO 7ØØ
76Ø IF C=2 THEN 79Ø
77Ø FOR A=@ TO LEN(B$) :: B=
ASC(SEG$(B$,A,@)) :: IF B<32
 OR B>127 THEN B$=SEG$(B$,@,
A-@)&"*"&SEG$(B$,A+@,255)
78Ø NEXT A
79Ø PRINT #@:B$ :: CALL KEY(
3,E,B) :: RETURN
8ØØ CALL INIT :: RETURN 16Ø
```

(See Page 19)

MY-MENU—

(Continued from Page 18)

```
810 ON ERROR 820 :: CLOSE #@
820 DISPLAY AT(11,6)ERASE AL
L :" ";SEG$(F$,@,4);" could
not be accessed" :: RETURN 6
50
830 DISPLAY AT(11,@)ERASE AL
L :P$: :"is not a valid prin
ter name": :"Modify name in
line 140" :: STOP
840 ON ERROR 850 :: CLOSE #2
850 ON ERROR 860 :: CLOSE #@
860 ON ERROR 870 :: DISPLAY
AT(11,5)ERASE ALL :"File ";A
$(A): :"    could not be acc
essed" :: GOSUB 690 :: RETUR
N 190
870 DISPLAY AT(22,2):"Could
not find file": : :: RUN 880
880 @=1 :: GOSUB 690 :: GOTO
 140
890 B$=DIR$&SEG$(A$(A),6,(LE
N(A$(A))-5)) :: DISPLAY AT(1
1,@)ERASE ALL BEEP :"Loading
 ";B$
900 CALL KEY(5,A,B) :: ON ER
ROR 930
910 CALL MARGINS(1,39,1,23)
920 CALL TCOLOR(16,5) :: RUN
 B$
930 B$=DIR$&SEG$(A$(A),6,(LE
N(A$(A))-5)) :: ON ERROR 870
940 CALL MARGINS(1,39,1,23)
950 CALL TCOLOR(16,5) :: RUN
 B$
960 DIR$=F$&SEG$(A$(A),6,(LE
N(A$(A))-5))&"."
970 CALL MARGINS(1,39,1,23)
980 DISPLAY ERASE ALL :: Y$=
"<Z> Aborts" :: ON ERROR 810
 :: OPEN #@:DIR$,INPUT ,RELA
TIVE,INTERNAL :: L,A,D=0 ::
INPUT #@:A$(D),G(D),X,Y(D) :
: A$(D)=DIR$
990 XS=2 :: SX=2 :: DS=0 ::
GOTO 210
1000 CALL MARGINS(1,80,1,24)
 :: CALL CLEAR :: STOP
1010 CLS :: CALL TCOLOR(4,14
) :: DISPLAY AT(1,3):" DISK
STATUS " :: CALL TCOLOR(2,15
)
1020 DISPLAY AT(2,3):"VOLUME
        ";SEG$(DIR1$,6,(LEN
(DIR1$)-5))
1030 DISPLAY AT(3,3):"TOTAL
SECTORS ";MZ
1040 CALL PEEK(VALHEX("FC00"
),A1,A2,A3,A4)
1050 DW$=CHR$(A1)&CHR$(A2)&C
HR$(A3)&CHR$(A4)
1060 DISPLAY AT(4,3):"WORKIN
G DIR    ";DW$
1070 IF DIR=6 THEN CALL TCOL
OR(2,16) ELSE 1090
1080 DISPLAY AT(7,3)INVERT :
" SUBDIRECTORIES PRESENT ";
:: CALL TCOLOR(16,7)
1090 CALL TCOLOR(4,14) :: DI
SPLAY AT(10,3):" SYSTEM STAT
US " :: CALL TCOLOR(2,15)
1100 CALL PEEK(VALHEX("0243"
),J,Q,U)
1110 IF CHR$(J)>"0" THEN 114
0
1120 IF CHR$(Q)="0" THEN IF
CHR$(U)="0" THEN 1130 ELSE 1
140
1130 DISPLAY AT(11,3):"DEFAU
LT MEMORY ALLOCATION" :: GOT
O 1160
1140 IF CHR$(J)<"3" THEN DIS
PLAY AT(11,3):"MEMORY ALLOCA
TION ";CHR$(J)&CHR$(Q)&CHR$(
U) :: GOTO 1160
1150 DISPLAY AT(11,3):"MEMOR
Y ALLOCATION ";CHR$(J)&CHR$(
Q)
1160 DISPLAY AT(12,3):"FREES
PACE        BYTES"
1170 MA$=CHR$(J)&CHR$(Q)&CHR
$(U) :: IF VAL(MA$)=0 THEN A
L=181098 :: DAT=63862 :: GOT
O 1190
1180 AL=181098+((VAL(MA$)-64
)*1024) :: DAT=63862+((VAL(M
A$)-64)*1024)
1190 DISPLAY AT(13,3):"   AL
L          ";AL
1200 DISPLAY AT(14,3):"   PR
OGRAM      ";"  65536"
1210 DISPLAY AT(15,3):"   DA
TA         ";DAT
1220 DISPLAY AT(16,3):"   AS
SEMBLY     ";"  47732"
1230 DISPLAY AT(17,3):"   ST
ACK        ";"   3968"
1240 CALL PEEK(VALHEX("F110"
),FA,FB,FC,FD,FE,FF,FG,FH)
1250 DISPLAY AT(18,3):"MEMOR
Y MAP"
1260 DISPLAY AT(19,3):"   00
=";SEG$(HEX$ (FA),3,2);"  01
=";SEG$(HEX$ (FB),3,2);"  02
=";SEG$(HEX$ (FC),3,2)
1270 DISPLAY AT(20,3):"   03
=";SEG$(HEX$ (FD),3,2);"  04
=";SEG$(HEX$ (FE),3,2);"  05
=";SEG$(HEX$ (FF),3,2)
1280 DISPLAY AT(21,3):"   06
=";SEG$(HEX$ (FG),3,2);"  07
=";SEG$(HEX$ (FH),3,2)
1290 CALL DCOLOR(4,5)
1300 DISPLAY AT(23,3):"DATE
";DATE$ ;" "; :: CALL DRAW(1
,1,17,184,17) :: CALL DRAW(1
,1,250,184,250) :: CALL DRAW
(1,184,18,184,249) :: CALL T
COLOR(4,7) :: RETURN
 0  1851  1281  2183  3917
1906  2022  4289  904  1550
 4944  4705  1598  494
 2276  5004  3976  4361  226
6  1137  2432  5602  2250  1
458  4369  3975  2916
 2412  1923  1594  4690  499
9  1064  4719  2337  1244  5
127  3091  4523  2546
 1634  3210  5064  5186  100
  4156  4938  94  4457  2958
  4624  4667  2675  3793 124
7  4399  5014  2521  1252  4
496  4624  4354  952  4758
582  3902  4704
 1049  1550  1874  4936  486
  4469  3882  2909  2553  27
63  4462  1507  1436
 5120  4832  4650  525  3400
  2169  4630  2221  2832  28
60  3407  2615  4515
 1460  3443  2516  5098  106
9  4522  1447  607  2656  16
51  1639  5347  347
 6006  1456  1631  1647  507
7  2494  3841  1795  4635  6
45  2038  1551  1810
 3061  1554  1813  2266  155
7  5075  4286  2050  2980  4
821  237  3694  2521
 2395  2410  2478  2736  481
8  4853  41  2094  1557  326
4  3865  4790  1081
 3553  2649  4507  580  3640
  2217  2657  2321  2699  25
50  3202  2081  4254
 1360  4259  1366  4180  123
3  4459  4503  32 TOTAL  478
975
```

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

#1. THE SINGING TI-99/4A SPEECH & MUSIC DISK
This is the disk everyone is talking about. The computer voice actually sings to animated graphics. Includes routines by master programmer Ken Gilliland. Bert & Earnie, Maltilda & much much more. 2 disk sides, speech & 32 K req. Exbasic autoload.

#2. WHEEL OF FORTUNE, BLACKJACK & JOKER POKER
Three fantastic freeware programs on one disk. Professional quality and the best "wheel" game around at any price. Vanna would love it !

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

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

#5 ORIGINAL TI SALES DEMO DISK WITH TI-TREK GAME
This disk is packed full of assorted files of all types. Graphics, speech etc. Contains complete TI-TREK game for Speech Editor or TE-II module.

#5A. TI MUSIC/GRAPHICS
A great collection of music and matching graphics. Great examples of music & sprite programming.

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

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

#8. LOTTO PICKER
This program randomly generates numbers for use in the various state lotto games and even runs a simulated lotto game. Easy to modify for pick 6 etc. games. A great learning and fun disk.

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

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

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

#12. TI-99 OLOPY
This great piece of programming actually simulates and plays the famous board game. For legal reasons we cannot name the game but "do not pass Go! but go directly to Jail!"

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

#14. FIGURE STUDY (PG RATED)
A collection of Playboy type centerfolds that can be printed out at your command. Use with any printer.

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

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

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

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

#19. TI WRITER/MULTIPLAN UPGRADE
This disk released by TI adds real lower case to your TI Writer, speed to Multiplan and other enhancements. Easy to use., just substitute new files for old! Instructions included.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#34. SOLITAIRE & SCRABBLE
Another collection of classic games for the TI-99/4A. Exbasic & 32K req.

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

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

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

#38. GREAT 99/4A GAMES VOL. I
A collection of professional games in assembly and exbasic that all load from a menu in exbasic. Includes a great ski game where you dodge the trees in a fast downhill run. We have included only the best.

#39. GREAT 99/4A GAMES VOL. II
Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially.

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

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

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

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

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

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

#46. SUPER TRIVIA 99
A great trivia game for 1 to 4 players with great questions and capability to add your own and print out the files. This one is a real challenge.

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

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#48. GHOSTMAN (from England)
This Pacman/Munchman type game starts at a slow pace and slowly speeds up to a break-neck pace. A totally new experience.

#49. DEMON DESTROYER (from France)
This great assembly game starts where Invaders leaves off. Add features like descending aliens and closing walls. Hours of great arcade action.

#50. OH MUMMY (from Germany)
Move through the chambers of a Pyramid in search of hidden treasure. Fantastic graphics and great entertainment.

#51. BERLIN WALL (from Canada)
This game requires a mine field to be crossed before escaping from E. Berlin. Good graphics and a real challenge.

#52. ANIMATION 99 (from Germany)
THIS IS THE ONE!!! A demo disk filled with computer animation routines like you have never seen before on any computer. See famous cartoon figures move with more realism that on Sat. morning TV. This disk received a standing ovation when previewed at a local users group. We have even included instructions how to do it yourself on the second disk side. This one is a show stopper!!!

#53. HACKER/CRACKER
A collection of disk copying programs that copy TI disks by tracks. If one of these can't copy a protected disk nothing will. We included a collection of the very best ones including both TI and CorComp compatible. These programs require 2 disk drives and 32K of memory.

#54. ASTRONOMY
This program from Australia plots the heavens and teaches you about the solar system. A great learning and reference tool. Exbasic and 32K required. Don't confuse this one with our Astrology demo. They are not the same...ask Nancy!

#55. SCREEN DUMP
This program allows you to dump disk and even module programs to a Star/Epson compatible printer. Comes with easy to follow plans to build a load interrupt switch which is needed to dump module programs. This dump program by Danny Michael is considered the best of the bunch! Complete with documentation.

#56. SPREAD SHEET
OK, it's not Multiplan but it works great and handles many spread sheet applications. A great way to learn to use spread sheet software. Comes with full instructions and documentation.

#57. TELCO
Considered one of the best data communications programs for the TI-99/4A. Complete with documentation.

#58. PR BASE
The alltime most popular and widely used data base program for the TI-99/4A. A freeware program that is widely supported and updated.

#59. GRAPH MAKER
A collection of the best programs for producing graphs and charts from your data. Exbasic and printer.

#60. FREDDY
A fantastic game where you guide the hero through underground passages filled with danger. Nintendo quality, great graphics and fast action. One of the best we have ever seen!!!

#61. THE MINE
A fast action game from F.R.C. that will keep you going for hours. Many screens and skills required.

#62. DISK MANAGER II MODULE BACKUP
The complete TI Disk Manager II on Disk. For legal reasons it is only available to owners of the original module for backup use.

#63. ASTROBLITZ/MAZOG
A pair of great games that continue where Parsec and Munchman leave off. Imagine Parsec with enemy space craft coming from in front and in back of your ship!!!

#64. MAJOR TOM/SPACE STATION PHETA
A pair of great space games. These two are going to keep you in front of the 99/4A for hours. Great!

#65. PERFECT PUSH
An all new space game where you assemble and launch a rocket ship in outer space while avoiding a space monster. This one is professional in very way..graphics, speed and action!!!

#66. HEBREW TYPEWRITER
This program converts your TI-99/4A keyboard into a typewriter that displays Hebrew letters on the screen. Can also be printed when used in conjunction with screen dump program (included). Great for religious training or making your copy of the dead sea scrolls or ten commandments!

#67. GENEALOGY
Now you can set up your family tree and store or print out the records. Great for keeping track of family relationships and records.

#68. CHESS
The original computer chess game Sargon has been reprogrammed for the TI-99/4A. Now play chess with your computer. Documentation included. Exbasic autoload.

#69. COMPUTER PLAYER PIANO/KEYBOARD CHORD ANALYSIS
A unique music program which displays a piano on the screen and actually plays your selections.

#70. TI RUNNER II
The very latest (and best) "runner" game based on TI Runner and Star Runner. Great action, graphics and entertainment.

#71. KIDS LEARNING II
Two more disk sides loaded with the best in educational programs. Kids improve their math, spelling and comprehension skills while having fun.

#72. CERBERUS
Fantastic space game from Germany. Pilot your ship through narrow and crooked channels in space without colliding. Great graphics and music.

#73. CRYPTO (gram)
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BASIC Assembly

Using assembly with XBASIC

By BARRY A. TRAVER
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Although this new column may be of interest to others as well, it is primarily intended for Extended BASIC programmers who are interested in learning assembly language or who are not interested in learning assembly language, but want to take advantage of assembly language routines in their programming. It is called "BASIC Assembly," because it ties together (X)BASIC and assembly.

First, let me say a few words in defense of BASIC and assembly, two languages sometimes commonly maligned. BASIC is faulted because it doesn't force structured programming (the GOTO command is especially bad here, it is said), and it's not as powerful or as fast as some other languages. Assembly is sometimes looked down upon because it is supposedly too difficult for the ordinary person to learn.

In defense of BASIC, it should be noted that BASIC is a "Beginner's All-Purpose Symbolic Instruction Code." (That just means a "Beginner's All-Purpose Language, but BAL doesn't spell anything interesting!) What this means is that BASIC as a language (just like the TI-99/4A as a computer) is good for a wide variety of applications (not to mention being simple to learn).

COBOL, for example, is great for commericial applications, but not as useful elsewhere (and, in the opinion of most people, is more difficult to learn than BASIC). Another specific example: BASIC contains a number of useful string-handling routines (e.g., SEG$) which FORTAN lacks, so it can be more difficult to work in FORTRAN with strings without the assistance of some specialized assembly routines. This is not to put down COBOL or FORTRAN: It is simply to point out that all languages have their particular strengths and weaknesses.

Some other languages are stronger for specific applications, but one nice thing about BASIC is its all-purpose nature. Along with that is the fact that many more people know BASIC than any other language. (In fact, I suspect that it was the first language learned by almost all of those who are now notable for work in other languages). If a program is written in BASIC, anyone who knows BASIC can usually easily modify or customize that program to his or her own liking, but fewer people can adapt programs written in other languages.

True, BASIC doesn't "force" structured programming, but it doesn't force unstructured programming either: it leaves the choice up to the programmer. In other words, BASIC is more flexible than some other languages (such as those in which the specific nature of variables must be carefully defined "up front"), so the BASIC programmer is free to write a throw-away quick-and-dirty program if he chooses, a more structured program if he so desires, or anything in between.

In defense of assembly, my own opinion is that assembly seems less accessible because of the way it is usually taught. In one assembly course that I visited, rather than teaching assembly in terms of what the students already knew, the teacher seemed to consider BASIC to be "an expletive to be deleted." (Telling the class that a JMP or B in assembly was similar to a GOTO in BASIC was perhaps regarded as corresponding to allowing a "pony" or "interlinear" in a course in Latin or Greek. For shame!)

Well, many good assembly programmers (including Mike Dodd, for example) learned assembly through writing CALL LINKs, linking BASIC and assembly. So far as assembly language is concerned for you, rather than having people treat you like a kindergartener, you should be permitted to build upon (and use) everything you already know about Extended BASIC while learning how to do even more through adding assembly routines in those specialized cases (and there are some) where more power or speed may be required than BASIC ordinarily allows.

As an XB programmer, of course, you can use these assembly CALL LINKs without understanding anything about assembly language, if you just want to use routines others have written without writing your own. A CALL LINK works essentially (or should I say BASICally?) just like a regular CALL in BASIC. All you need to know is what the routine does and what parameters (if any) you need to include.

In BASIC, you have, for instance, CALL HCHAR(ROW,COL,CHAR,NUMBER). If we had to invent a CALL LINK to do the same thing, it might look something like this: CALL LINK("HCHAR",ROW,COL,CHAR,NUMBER). In either case, there may be parameters that need to be passed along (in this case, ROW, COL, CHAR, and NUMBER), but that's not difficult to do.

Passing parameters is simple, but it can get a little tiresome, since in assembly you're continually writing minor variations of the same code. A CALL LINK may result in up to three operations: (1) passing parameters from BASIC to assembly, (2) doing what needs to be done in assembly, and (3) passing parameters from assembly back to BASIC. The heart of the matter is the middle step, but the before and after steps for short routines may actually take up more lines of code.

Here are examples of how to GET a numeric or string parameter from XBASIC:

```
* GET NUMBER FROM XB TO ASSEMBLY
        CLR     R0          (not a whole array)
        LI      R1,1        (number of parameter, e.g., 1st, 2nd, 3rd, etc.)
        LI      R2,PARAM1   (place to put it, e.g., PARAM1, PARAM2,
                             PARAM3, etc.)
        BLWP    @NUMREF     (REFerence the NUMber, i.e., GET it!)
        BLWP    @XMLLNK
        DATA    CFI         (Convert Floating point to Integer)
        MOV     @FAC,*R2    (move it from FAC to storage place)
* GET STRING FROM XB TO ASSEMBLY
```

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BASIC ASSEMBLY—

(Continued from Page 24)

```
CLR   R0          (not a whole array)
LI    R1,2        (number of parameter, e.g., 1st, 2nd, 3rd, etc.)
LI    R2,PARAM2   (place to put it, e.g., PARAM1, PARAM2,
                   PARAM3, etc.)
LI    R6,>FF00    (these two lines allow maximum size string to be
MOVB  R6,*R2      passed from XBASIC to assembly, i.e., 255
                   chars)
BLWP  @STRREF     (REFerence the STRing, i.e., GET it!)
```

Here are examples of how to SEND a numeric or string parameter to XBASIC:

```
* SEND NUMBER FROM ASSEMBLY TO XB
      CLR   R0          (not a whole array)
      LI    R1,3        (number of parameter, e.g., 1st, 2nd, 3rd, etc.)
      LI    R2,PARAM3   (place it is at, e.g., PARAM1, PARAM2,
                         PARAM3, etc.)
      MOV   *R2,@FAC    (move it from storage place to FAC)
      BLWP  @XMLLNK
      DATA  CIF         (Convert Integer to Floating point)
      BLWP  @NUMASG     (ASsiGn the NUMber, i.e., SEND it!)
* SEND STRING FROM ASSEMBLY TO XB
      CLR   R0          (not a whole array)
      LI    R1,4        (number of parameter, e.g., 1st, 2nd, 3rd, etc.)
      LI    R2,PARAM4   (place it is at, e.g., PARAM1, PARAM2,
                         PARAM3, etc.)
      BLWP  @STRASG     (ASsiGn the STRing, i.e., SEND it!)
```

To save work (and to reduce space required for future articles in this series), I have invented a universal "Practical Parameter Passer," designed to simplify the GETting of parameters from BASIC and the SENDing of parameters back to BASIC. Using it is as simple as adding a BL @GET before your main routine and a B @SEND after it (or a B @RETURN if no parameters are passed back to BASIC).

Included with this article are four text files: GET/SEND/S (a file also needed for future articles in this series, so don't lose it!), OUTLINE/S (which shows the basic structure for writing CALL LINKs using this approach), WINDOW/S (yes, Virginia, assembly does do windows, and here's a simple "window" routine to put on the screen a string in a rectangular box), and WINDOWDEMO (the text listing of a short XB program to demonstrate how CALL LINK("WINDOW",ROW,COL,WIDTH,STRNG$) works). (Needless to say, the WINDOW routine could be used to put a graphic icon or image rather than text in a box on the screen, assuming that characters have been properly redefined.)

This column is designed to be (not the primary aid but) a supplementary aid for those learning assembly. If you are an assembly student, I trust that you are also already making use of a main

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BASIC ASSEMBLY—

(Continued from Page 25)

resource, such as Lottrup, McComic, Molesworth, Morley, or York and Inzana. (By the way, if you are using Lottrup, you may be interested to know that I have prepared a disk to assist with the opening chapters of Lottrup; if you want it, ask for 'Lottrup disk' and send $7.50 to Barry Traver, 835 Green Valley Drive, 835 Green Valley Drive, Philadelphia, PA 19128. Don't send for the disk, however, unless you already own the book: otherwise the disk will be useless to you.)

For simplicity's sake, the WINDOW assembly routine does not do any error checking, but such could be added if desired (or you can do the checking in XB before the parameters are passed, as is done in my XB demo program). The aim here is working assembly source code that is easy to follow rather than what may be necessarily the most efficient, detailed, or complete code. (Example: it is more customary for assembly programmers to use a smaller number of Registers for a wide variety of purposes, but in WINDOW/S I use many Registers, each with a single purpose, to make it simpler for a novice to track the logic involved.)

The teaching approach in this column is more inductive than deductive, so if something isn't explained one month, it may be another month. If you can't wait and are willing to pay the phone charges, you are invited to call me at 215/483-1379. (As some people are aware, I'm not as good with written correspondence, although you are invited to write or phone me with suggestions as to what you'd like to see in future columns.) I'm personally excited about how well (X)BASIC and Assembly work together, and hope that the material shared here will be helpful and enjoyable to you, leading to the enrichment of the TI community as a whole as a result of new programs you may write with these techniques!

TECHNICAL NOTES

MOVB *R8+,R1 is just a shorter way of saying MOVB *R8,R1 followed by INC R8; you can do it the longer way if you're not yet comfortable with the '+'. If you're wondering why there's no CI R9,0 between the DEC R9 and the JEQ LSTLNE, you'll be happy to know that if a DEC command is followed by a conditional Jump (such as JEQ, JNE, etc.), it acts as if there were such a Compare command between the two. These are two very common ways of saving a couple of bytes of memory here and there, but there's no harm in doing it the longer way, if it's easier for you to follow.

MICROPEND!.GET/SEND/S

```
*****************************************
*                                       *
* PRACTICAL PARAMETER PASSER            *
*  (A.K.A. GET/SEND/S)                  *
*    COPYRIGHT (C) 1989, 1990           *
*     BY BARRY A. TRAVER                *
* If you frequently do CALL LINKs that  *
*  pass along simple numbers and        *
*  strings (either as variables or as   *
*  constants), BL @GET and B @SEND      *
*  will make that a lot simpler to do.  *
* The parameter (whether it be numeric  *
*  or string) will be placed at         *
*  PARAM1, PARAM2, PARAM3, etc.         *
* This routine can handle all of these  *
*  parameter types:                     *
*    0 - Numeric expression             *
*    1 - String expression              *
*    2 - Numeric variable (incl. array  *
*     element)                          *
*    3 - String variable (incl. array   *
*     element)                          *
* It cannot handle these two parameter  *
*  types:                               *
*    4 - Numeric array                  *
*    5 - String array                   *
* In other words, it can handle         *
*  everything except for full arrays.   *
*****************************************

* SET UP XB EQUATES (Expand if desired;
*  see pages 415-416 of E/A manual.)

ARG1ID EQU  >8300
ARGNUM EQU  >8312
BASIC  EQU  >006A
CIF    EQU  >0020
CFI    EQU  >12B8
CSN    EQU  >11AE
ERR    EQU  >2034
FAC    EQU  >834A
GPLWS  EQU  >83E0
KEYDEV EQU  >8374
KEYVAL EQU  >8375
KSCAN  EQU  >201C
NUMASG EQU  >2008
NUMREF EQU  >200C
STATUS EQU  >837C
STRASG EQU  >2010
STRREF EQU  >2014
VMBR   EQU  >202C
VMBW   EQU  >2024
VSBR   EQU  >2028
VSBW   EQU  >2020
VWTR   EQU  >2030
XMLLNK EQU  >2018
XRTN   EQU  >8377
YRTN   EQU  >8376

*****************************************

* SET ASIDE SPACE FOR WORKSPACE
WS     BSS  32

* SET ASIDE TEMPORARY NUMERIC STORAGE
*  PLACE (SOMETIMES USEFUL FOR FLAG)
TEMP   BSS  2

* SET ASIDE SPACE FOR PARAMETERS
*  (EXPAND IF NEEDED, ACCORDING TO
*   NUMBER OF PASSED PARAMETERS,
*   OR IF NOT ALL ARE NEEDED, THEN
*   YOU CAN REDUCE TO SAVE MEMORY)
PARAM1 BSS  256
PARAM2 BSS  256
PARAM3 BSS  256
PARAM4 BSS  256

*****************************************

* Here's how the Registers are used in
*  GET and SEND:
* R0 = 0 (indicates not a whole array)
* R1 = Number of parameter (1st, 2nd,
*  3rd, etc.)
* R2 = Address of storage place for
*  parameter (PARAM1, PARAM2, etc.)
* R3 = (Backwards) counter for number
*  of arguments
* R4 = Address of ID of argument
* R5 = ID of argument (i.e., type)
* R6 = >FF00 (used for STRREF in GET)

*****************************************

* CODE FOR BL @GET

* SET UP THINGS TO GET STARTED
GET    CLR  R0
       LI   R1,1
       LI   R2,PARAM1
       MOVB @ARGNUM,R3
       SRL  R3,8
       LI   R4,ARG1ID
       LI   R6,>FF00

* TEST FOR PARAMETER TYPE
GETTST MOVB *R4+,R5
       SRL  R5,8
       CI   R5,0
       JEQ  GETNUM
       CI   R5,1
       JEQ  GETSTR
       CI   R5,2
       JEQ  GETNUM
       CI   R5,3
       JEQ  GETSTR
       B    @GETNXT

* GET PARAMETER FROM XB (IF IT'S A
*  NUMBER OR NUMERIC EXPRESSION)
GETNUM BLWP @NUMREF
       BLWP @XMLLNK
       DATA CFI
       MOV  @FAC,*R2
       B    @GETNXT

* GET PARAMETER FROM XB (IF IT'S A
*  STRING OR STRING EXPRESSION)
GETSTR MOV  R6,*R2
       BLWP @STRREF

* CHECK ON NEXT PARAMETER
GETNXT DEC  R3
       JEQ  RESUME
       INC  R1
       AI   R2,256
       B    @GETTST
```

(See Page 27)

BASIC ASSEMBLY—

(Continued from Page 26)

```
* RESUME AT MAIN ROUTINE
RESUME RT

*****************************************

* CODE FOR B @SEND

* SET UP THINGS TO GET STARTED
SEND   CLR  R0
       LI   R1,1
       LI   R2,PARAM1
       MOVB @ARGNUM,R3
       SRL  R3,8
       LI   R4,ARG1ID

* TEST FOR PARAMETER TYPE
SNDTST MOVB *R4+,R5
       SRL  R5,8
       CI   R5,2
       JEQ  SNDNUM
       CI   R5,3
       JEQ  SNDSTR
       B    @SNDNXT

* PASS PARAMETER TO XB
*  (IF IT'S A NUMERIC VARIABLE)
SNDNUM MOV  *R2,@FAC
       BLWP @XMLLNK
       DATA CIF
       BLWP @NUMASG
       B    @SNDNXT

* PASS PARAMETER TO XB
*  (IF IT'S A STRING VARIABLE)
SNDSTR BLWP @STRASG

* CHECK ON NEXT PARAMETER
SNDNXT DEC  R3
       JEQ  RETURN
       INC  R1
       AI   R2,256
       B    @SNDTST

* RETURN TO EXTENDED BASIC
RETURN LWPI GPLWS
       B    @BASIC
*****************************************
```

MICROPEND!.OUTLINE/S

```
* OUTLINE/S
*  (C) COPYRIGHT 1990
*   BY BARRY A. TRAVER

       COPY "DSK1.GET/SEND/S"

* CALL LINK("NAME",A,B$,C,D$)

       DEF  NAME
A      EQU  PARAM1
B$     EQU  PARAM2
C      EQU  PARAM3
D$     EQU  PARAM4

* OPTIONAL, BUT GOOD PROGRAMMING
*  PRACTICE (ESPECIALLY FOR THE
*  BEGINNER):  TELL WHAT YOU WILL
*  BE USING THE REGISTERS FOR!

* R0 =
* R1 =
* R2 =
* R3 =
* R4 =
* ETC.

NAME   LWPI WS

       BL   @GET

*****************************************

* THIS IS THE MAIN WORKING PART!
* IT'S THE MEAT BETWEEN THE TWO
* SLICES OF BREAD THAT ARE MADE
* UP OF  BL @GET  AND  B @SEND.

*****************************************

       B    @SEND

* IF YOU KNOW YOU'RE NOT SENDING
*  BACK ANY PARAMETER VALUES TO
*  XB, YOU CAN USE THIS INSTEAD:

*      B    @RETURN

       END
```

MICROPEND!.WINDOW/S

```
* WINDOW/S
*  (C) COPYRIGHT 1990
*   BY BARRY A. TRAVER

       COPY "DSK1.GET/SEND/S"

* CALL LINK("WINDOW",ROW,COL,WIDTH,STRNG$)

       DEF  WINDOW
ROW    EQU  PARAM1
COL    EQU  PARAM2
WIDTH  EQU  PARAM3
STRNG$ EQU  PARAM4

* R0 = SCREEN ADDRESS TO WRITE
* R1 = CHARACTER TO WRITE
* R2 = ROW
* R3 = 32
* R4 = (RESULT OF CALCULATIONS)
* R5 = COL
* R6 = WIDTH
* R7 = WIDTH COUNTER (BACKWARDS)
* R8 = STRING ADDRESS TO READ
* R9 = STRING COUNTER (BACKWARDS)

WINDOW LWPI WS

       BL   @GET

* POSITION = (ROW-1)*32+(COL-1)
*  (PUT RESULT IN R0)
       MOV  @ROW,R2  GET THE ROW
       DEC  R2       THAT'S (ROW-1)
       LI   R3,32    MULTIPLY
       MPY  R2,R3    THAT'S (ROW-1)*32
       MOV  @COL,R5  GET THE COL
       DEC  R5       THAT'S (COL-1)
       A    R5,R4    ADD THE TWO
       MOV  R4,R0    THAT'S THE RESULT!

* PUT STARTING VALUES IN OTHER
*  REGISTERS (EXCEPT R1 FOR NOW)
       MOV  @WIDTH,R6
       MOV  @WIDTH,R7
       LI   R8,STRNG$+1
       MOVB @STRNG$,R9
       SRA  R9,8

* WRITE CHARACTERS, ONE BY ONE
AGAIN  MOVB *R8+,R1   PUT CHAR IN R1
       AI   R1,>6000  ADD BASIC BIAS
       BLWP @VSBW

* CHECK IF WHOLE STRING IS DONE
       DEC  R9
       JEQ  LSTLNE

* CHECK ON WHOLE WIDTH IS DONE
       DEC  R7
       JNE  CONT

* IF NECESSARY, START A NEW ROW
       MOV  R6,R7    RESET COUNTER
       AI   R0,32    JUMP DOWN A ROW
       S    R6,R0    AND BACK UP A BIT

* CONTINUE WITH A NEW CHARACTER
CONT   INC  R0
       JMP  AGAIN

* WAS LAST LINE FILLED BY LAST CHAR?
LSTLNE DEC  R7
       JEQ  DONE

* IF NOT, THEN FILL IN WITH SOME BLANKS
       LI   R1,>2000  PUT "32" IN R1
       AI   R1,>6000  ADD BASIC BIAS
BLANKS INC  R0
       BLWP @VSBW
       DEC  R7
       JNE  BLANKS

* WE'RE FINSHED, READY TO RETURN TO XB!
DONE

       B    @RETURN

       END
```

WINDOWDEMO

```
100 ! WINDOWDEMO (C) COPYRIG
HT 1990 by Barry A. Traver
110 ! WINDOW/S must first be
 assembled to produce file c
alled WINDOW/O
120 ! N.B.:  COL assumes 32
columns (as in HCHAR), not 2
8 (as in DISPLAY AT).
130 CALL INIT
140 CALL LOAD("DSK1.WINDOW/O
")
150 ON WARNING NEXT :: CALL
CLEAR :: CALL SCREEN(12)
160 FOR I=0 TO 12 :: CALL CO
LOR(I,16,5):: NEXT I
170 CALL CHAR(143,""):: CALL
 HCHAR(1,1,143,608)
180 READ ROW,COL,WIDTH,STRNG
$ :: IF ROW=0 THEN 200
190 CALL LINK("WINDOW",ROW,C
OL,WIDTH,STRNG$):: GOTO 180
200 DISPLAY AT(20,1):"ROW?
7":"COL?  8":"WIDTH?  9":"ST
RING?":"THIS IS A DEMO OF WI
NDOW."
210 ACCEPT AT(20,7)SIZE(-2):
ROW :: IF ROW<1 OR ROW>24 TH
EN 210
220 ACCEPT AT(21,7)SIZE(-2):
COL :: IF COL<1 OR COL>32 TH
EN 220
230 ACCEPT AT(22,9)SIZE(-2):
```

(See Page 28)

The TI-Base User's Guide

Speeding up loading times

By BILL GASKILL
©1990 B. Gaskill

TI-Base is indisputably the slowest loading database manager available when run from its native SS/SD floppy disk. Why it is so slow to load is a combination of factors, such as the need to boot the multiple files that make up the program, the hardware used to do the loading and the fact that TI-Base supports a variety of loaders, each of which take varying amounts of time to get TI-Base up and running.

The slowest loader that you can choose is the Extended BASIC loader, which does a CALL LOAD that pokes TIBASEB into memory so that it can set up the loading environment for TI-Base. The slowest hardware environment that you can choose is a mechanical floppy drive because it rotates at only 300 rpm and then only on demand. So you not only have the slow rotation of the disk, but you also lose a little more time waiting for the disk drive to start up and then find things on the floppy. Put the two together and you get a 60-70 second load time.

The fastest loader is the TIBASEP file, which is an E/A option 5 file. When used with the Horizon RAMdisk and John Johnson's Menu (running ROS V7.35 or higher) the load time drops to well under 10 seconds. TIBASEP is a program image file and thus loads with the same kind of speed that causes Personal Record Keeping data files to load so fast. The RAMdisk operation is electronic rather than mechanical, which should explain on it's face why it outperforms a normal floppy disk, and J.J.'s Menu allows TIBASEP to be loaded at the press of a single key, with no module swapping. Put them all together and you have a blazing operational environment that any IBM computer owner would drool over. If you are a hard disk drive owner the load time is only slightly slower than a RAMdisk, since drive speed is comparable and the TIBASEW hard disk loader is also a program image file.

Regardless of the loader used, your choice of hardware will have an impact on most things that TI-Base does. Because the 99/4A has such a small amount of memory for TI-Base to work in, many of the features are placed in a program overlay file. As with most database management programs written for the IBM world, TI-Base uses the overlay concept to switch different functions in and out of memory as needed. This allows the main shell of the program to be memory resident while individual, task-specific features can share the predefined memory space that has been set aside for overlay usage.

Since the overlay file resides on disk rather than in memory, the speed of your disk drive will have a direct effect on how quickly overlay features are accessed. This access time has a corresponding effect on the speed of overall program operation. Thus the more times you perform a function that requires access to TI-Base's OVRLAY/P file and the program segments that it houses, the slower the overall operation of the program is going to be. This becomes painfully obvious to the floppy disk user, but goes almost unnoticed when a ram disk or hard disk drive is used.

It is quite possible that TI-Base can be run just as efficiently from any of the other RAMdisks that are available. I just don't own them and thus cannot verify whether they do or not perform the same. I am not promoting the Horizon RAMdisk over the Corcomp, Myarc, Quest or Rave units, I just happen to own it. I do like being able to turn my computer on, have J.J.'s Menu appear as the default screen, and then just press a single key to have TI-Base up and running in less than 10 seconds. If you are a serious TI-Base owner as I am, I think that you will too.

This is the first of a series of tutorials on using TI-Base.—Ed.

BASIC ASSEMBLY—

(Continued from Page 27)

```
WIDTH :: IF WIDTH<1 OR WIDTH
>32 THEN 230
240 ACCEPT AT(24,1)SIZE(-28)
:STRNG$ :: IF STRNG$="" THEN
 240
250 LASTROW=ROW+INT((LEN(STR
NG$)+WIDTH-1)/WIDTH)-1 :: LA
STCOL=COL+WIDTH-1 :: IF LAST
COL>32 THEN LASTCOL=LASTCOL-
32 :: LASTROW=LASTROW+1
260 IF LASTROW>19 THEN 210
270 CALL LINK("WINDOW",ROW,C
OL,WIDTH,STRNG$)
280 GOTO 210
290 DATA 1,3,9,"A DEMO OFWIN
DOW",4,3,18,"(C) COPYRIGHT 1
990BY BARRY A. TRAVER",1,22,
10,"WINDOWS OFMANY SIZESAND
PLACES"
300 DATA 6,30,2,"ABCDEFGHIJK
LMNOPQRSTUVWXYZ",0,0,0,""
```

Rave demonstrates new expansion box at Boston fair

Rave 99 demonstrated its new expansion box at the Boston Home Computer Fair May 5.

No formal presentations were made at the event. Dr. Donald Mahler of the group notes, however, that other "outstanding demos" were Mi Kyung Kim with MY-Art "with a disk of her whimsical drawings available," Jack Sughrue with Artist Print Shop, Bud Mills with Memex and Wayne Stith with Triad.

Vendors displaying their new products included Texaments (Steve Lamberti), Bud Mills, CaDD Electronics (Mark van Coppenolle), JP Software (Peter Hoddie, Paul Charlton and Stith), Rave 99 (John McDevitt), Asgard Software (represented by Mickey Schmitt) and Comprodine (represented by Jack Sughrue).

User groups with displays included the Boston Computer Society; Club 99 of Attleboro, Massachusetts; MUNCH of Worcester, Massachusetts; Brockton Users Group; and the Nutmeg 99ers of Connecticut.

EXPANDING YOUR SYSTEM

Keyboards and 80-column cards

By JOHN KOLOEN

Last month the subject was RAMdisks, and this month we turn to extended keyboards and a few other items. However, one RAMdisk manufacturer was inadvertantly left out of last month's article. The company, Rave 99, produces a line of RAMdisks, ranging from 64K to 544K. A review of the Rave RAMdisks was published in the April 1990 issue. For information about the Rave cards, write: Rave 99 Co., 112 Rambling Rd., Vernon, CT 06066; 203-871-7824.

Obviously, if you've expanded your system to this point, you've made a big commitment to the TI. By now you've got a system that includes a memory expansion and disk system. Perhaps you've got a color monitor and possibly a printer and RS232 port and maybe even a modem. So, what's next?

Since we haven't gotten into software yet in this series, let's look at more exotic hardware expansion items. In this category I would include extended keyboards, 80-column cards and multi-function cards.

EXTENDED KEYBOARDS

There is only one manufacturer of extended keyboards for the TI99/4A, and that is Rave 99 Co. (112 Rambling Rd., Vernon, CT 06066; 203-871-7824). The company introduced its original extended keyboard several years ago. The system consists of a low-profile, PC-style keyboard and an interface card. The interface card is attached to the TI console and the PC-style keyboard is plugged into the card. The keyboard cable is long enough so that the TI console may be placed out of the way so that it doesn't interfere with the new keyboard. The console is still used as a port for cartridges and for connection to the Peripheral Expansion Box.

The keyboard features several modes of operation, including TI-Writer, Multiplan and Editor/Assembler modes. In these modes, the keyboard's function keys are programmed to make full use of these programs. In any mode, the function keys provide single-keypress access to any of the FCTN-plus-numeric key operations supported by the TI. The Rave keyboard has 101 keys, and is generally easier to use than the TI keyboard. It is of particular advantage to those who frequently use TI-Writer. You can also move the keyboard around — put it on your lap, for example — while computing, which is something you can't do with the TI console.

Rave 99 offers several keyboard packages, including the keyboard by itself, the interface card by itself, the keyboard and interface card together, and an interface card kit. The complete package is $224.95. For more information, refer to the review published in the December 1986 MICROpendium or contact the manufacturer.

80-COLUMN CARDS

There are several 80-column cards on the market, though none is promoted to any great degree. The first one on the market was the Foundation 80-Column Card, which worked in connection with its Z80A card to allow users to run C/PM software on the TI. The Foundation 80-column card could not be used with any TI software, which greatly limited its usefulness.

There are two 80-column cards which do support TI software: One is manufactured in the U.S. by Dijit Systems, and the other is manufactured in Germany by Mechatronics. The video processors in these cards basically replace the VDP processors in the TI.

The best supported 80-column card in North America is the Dijit Systems AVPC card (Advanced Video Processor Card). This card includes a mouse and light pen port and supports a 512-color palette. Installation requires a minor change to the TI console. It features up to 192K of VDP RAM for video processing.

The card sells for for about $250 and is available through Dijit Systems, 4345 Hortensia St., San Diego, CA 92103; 619-295-3301.

The Mechatronics 80-column card (reviewed in the October 1987 MICROpendium) is a German import that has had limited distribution in the U.S. The U.S. distributor stopped carrying the card last year but Asgard Software may order some of the

(See Page 30)

HORIZON RAMDISK MEMEX P-GRAM+

HORIZON BARE BOARD, Manuals,ROS 8.12 $45
ALL KITS INCLUDE THE NEW ROS 8.12 $10
K Zero K Kit= Above + parts, NO memory $100
I NEW 128k Chips allow 1.5 MEG on one layer.
T 128k $170, 256k $235, 384k $300, 512k $365
S 800k $475 ; One Meg $600 ; 1.5meg $CALL
the following are used with the GENEVE
Add 128k Boot to any above kit $90
PHOENIX KITs 128/384k $390, 256/800k $635
All Horizons can add one chip at a time.
THE RAMBO MOD for any HORIZON $45
P-GRAM kit 72k $150 or with Clock $170
NEW P-GRAM+ kit 192k $240 w/Clock $260
Pre-Built READY TO RUN ADD $30 to kit price
* * * * * * * * * * *
MEMEX MEMory EXpansion for the GENEVE
MEMEX 504k without GENEVEMOD $245 NO KIT
A MEMEX over 504k requires a GENEVEMOD.
MEMEXs with GENEVEMOD, 504k $345,
1008k $395, 1512k $445, 2016k $495
GENEVEMOD runs ZERO WAITSTATE Operation
of the MEMEX MEMORY up to 1.5 meg and
all external Buss operations EXCEPT DSRs.
2 meg Zero w/s disables GENEVE 512 and
replaces the GENEVE Eprom.
* * * * * * * * * * *
Ohio Residents add 6% sales tax
Ship OverSeas ADD $5 Surface or $10 AIR,
or orders under $50 add 10% for AIR.
FREE Shipping in U.S. and CANADA.
PRICES may change if memory costs go UP.
Please Call or Write for ORDER or info.
Bud Mills Services, 166 Dartmouth Dr.
Toledo Ohio 43614. Ph 419-385-5946.
Call TI-COMM BBS on 419 385 7484 for
the latest prices or information.
300 Baud,7bit,e / 1200,8,n / 2400,8,n
AmEX or MasterCard or Visa ADD %10
Phone orders CALL Bud on 419-385-5946
OR Disk Only Software 1-800-736-4951

EXPANDING YOUR SYSTEM—

(Continued from Page 29)

cards if enough users want them. However, Mechatronics requires a minimum number to be ordered, which may make receiving a Mechatronics card a problematic prospect at best. Contact Asgard at 703-255-3085 for more information.

Unlike the Dijit card, the Mechatronics card — at least the version that was reviewed — used OPEN and PRINT statements to access ROM-based Extended BASIC operations. This means that information that appears on the screen is sent there as if the monitor were an input/output device like a printer. Programs such as TI-Writer and Multiplan that were specifically modified for use with the card work in a more conventional, direct fashion. Cost of this card is in the $250 range.

What should one expect from an 80-column card? Well, don't expect to see your 32- and 40-column software suddenly transformed to 80 columns (though you can expect sharper images and graphics with your TI software). Software has to be written or rewritten for 80-column display. However, a number of programs are available in 80-column mode, including TI-Writer, Multiplan and Funnelweb. Of course, the cards support the video modes available with the TI, so there should be no problem running most 32-column software.

Any purchasing decisions you make should include the need for a new monitor. These cards are not designed to work with the composite monitors used by the TI. Both require an 80-column rated, analog RGB monitor. This also means that they cannnot be used with a TTL-style PC monitor.

It is important to contact the manufacturer prior to ordering an 80-column card. Specifications may change, which you will want to know about. Also, if you have questions about what other peripheral cards and software will or won't work with the card, this is the best way to get your questions answered. Also, the manufacturer can make recommendations about monitors.

MULTI-FUNCTION CARDS

The only multi-function card I am aware of is Triple Tech by CorComp Inc. This card includes a battery-backed clock/calendar, a 64K printer buffer and a slot for a speech synthesizer board.

The clock/calendar is designed to be accessed through Extended BASIC and continuously updates the time and date. The printer buffer takes files that you send to a printer, places them in a buffer and feeds them to the printer, thus freeing up your computer for other use. Also, Triple Tech lets you move the TI Speech Synthesizer from the side-port of your console into the PEB itself. This is done by removing the speech processing board from the speech synthesizer and plugging it into Triple Tech. The card originally retailed for about $150.

Next month: Odds and ends.

Lima Fair was fun for 300-350 visitors

By HARRY BRASHEAR

I have been to several TI fairs over the past three years and they were all interesting, educational, and fun. The best one yet to my way of thinking was the Lima Fair held in May.

I think a lot of people already knew what I didn't — that this one was strictly top shelf — and waited out a couple of others to come to Lima. Since no charges were involved at Lima, either for the participants or the crowd, it would be hard to say how many people came and went. The only reason to come to the sign-in table was to get a free door prize ticket. Having noticed that a lot of people ignored this, I would estimate that 300-350 people attended. Every user group and retailer that I talked with was tickled with the results of the day. I should also point out that since tables were free, there was a huge contingent of groups from all over the central region. It was positively inspirational.

There were a number of new products available from various vendors, not the least of which was the announcement of a new hard disk controller from Electronic Systems Development Corp. Release date is expected to be announced soon.

Asgard Software introduced some new packages for Page Pro, including a set of new borders, and program called Title Maker. The latter allows you to create extra large font titles outside of the PP environment, then insert them as a Page Pro picture. We'll check these packages out a little further and talk about them next month. There was also some discussion of the new MIDI port from Asgard but that may need a month or two to finish also.

That's all well and good, but what I want to say here is a little further reaching.

The Lima Fair is a phenomenon for a lot of reasons. First of all, the Lima Technical College campus, where it was held, is beautiful. The buildings are neat and blend nicely with the grounds, very conducive to the learning process. The space available to the fair was more than ample, easy to find, and included a cafeteria. There was plenty of parking, and if there were heavy loads, you could drive right up to the door.

The city of Lima is easy to get to, and small enough to get around without half trying. There are enough good motels within proximity of the campus to satisfy the weary traveler, and a good selection of food is offered around the city.

Also, for you train buffs — you can view the last Nickel Plate No. 779 built by the Lima Locomotive Works, and a nifty gear driven Shay while in the area. (That was a bit of editorial license concerning a few of us with "other" hobbies.)

I had the best day of my TI life at the Lima Fair. I want to thank each of this tiny group of dedicated TIers who give themselves to our community so freely: Mel Nomine, Earl Heisterman, Bob Harshe, Charles Good, Harry Muntis, Andy Frueh, Mike Martinko, Aruid Harklow, Leonard Cummings, Dave Szipple, and any others that I may have missed in the rush.

To readers — stick a note to your calendar and come on out to Lima next year — it's worth every minute of the trip.

Quest RD200 RAMdisk

A RAMdisk that lets you start small and grow from there

By BOB CARMANY

Not many RAMdisks have been reviewed in MICROpendium. There hadn't been much need. To be sure, Grand RAM started out with the best of intentions, but I never heard of anyone who actually had a production model in hand. The idea was appealing — a RAMdisk that could be gradually expanded instead of having to fork over $300 (or more) for a fully configured RAMdisk. It sure would be nice to have one that you could add to a few chips at a time.

If you bought one of the early-technology Horizons, you could always get an upgrade kit and piggyback chips until you had what you wanted, but, besides being aesthetically obnoxious, piggybacking chips is not the easiest thing to do.

One of the least-known products of the Hunter Valley Users Group is a neat little PE-Box card called the Quest RAMdisk. I may have the only one in existence in the U.S. It is really too bad that word of Quest hasn't reached the rest of the TI community because it is really superb!

The Quest RD200 comes as what could best be described as a semi- bareboard. That is, all of the unique chips (two PAL chips) are socketed and in place on the board. Along with it come a list of supplies and complete directions on the board's assembly. So, if you have a little expertise in assembling electronics kits, this should prove to be no real problem. Besides, at approximately $60 (U.S) it is a real deal! Software is also provided in the form of an auto-boot program called AUTO and AUTP, a program to configure and load the DSR (Device Service Routine) called QUEST and a DSR to use for your initial load called RQK.

The Quest is relatively simple in construction. The DSR is contained in an 8K 6264-LP chip and takes up no RAM space. Sockets can be easily installed for the 17 32K x 8 chips (62256 or equivalent.). Sixteen of the chips are reserved for RAM and the 17th will replace the 32K card if so desired. The CRU address of the card (i.e., >1000, >1400, >1600) is selectable with a jumper on the board and is well marked. Another jumper is used to select the 32K option if you choose to buy the 17th chip. A third jumper enables the battery circuit, which keeps the three NI-CAD batteries charged whenever the computer and PEB are turned on. One of the most attractive aspects of Quest is that you aren't faced with the outlay of several hundred dollars immediately. The DSR will handle any number of chips from one (128 sectors) to the full compliment of 16 (2048 sectors).

You can find the best deal on RAM chips and put in as many as your budget will allow and add to it from time to time. The batteries will run about $10 for three and the 6264-15LP chip will cost about $4.50. As you might imagine, the RAM chips are the biggest expense. However, the price fluctuates widely and I found them from $6.50 each to $13.95 each for the 150-nanosecond chips. So, the price for a fully-configured 512K model will range from under $200 to a little over $300 depending on how much you pay for the chips.

Performance: The Quest is really superb! It comes with a *heavily* modified version of John Johnson's BOOT program (fairware donations are encouraged) that allows for the bypassing of the TI title screen and the loading of 15 assembly language or Extended BASIC programs residing on the RAMdisk. Built-in commands enable or disable the autoboot program and turn the write-protect on or off on the Quest. Also included is the ability to CALL A/L programs from BASIC or XB by installing them in the DSR. For example, Archiver could be CALLed from BASIC with a CALL AR (assuming that to be the program name).

Loading and reconfiguring the DSR is easy. Once the DSR is installed and your programs have been copied to the Quest, it functions exactly like a physical disk drive, but with one notable exception — sheer, raw speed! Everything loads must faster from RAMdisk than from a physical disk drive. The most noticeable increase in speed will be found with programs that access a drive by moving bits of code in and out of memory like Telco, Multiplan and Dragonslayer's Spellcheck. The performance is excellent!

Even the CALLs that the RD200 uses have been engineered to co exist with other RAMdisks (notably the Horizon). Several are available in the Quest itself, such as CALL AON and CALL AOF which turn the AUTO program on and off, respectively. The write-protect on each partitioned part of the Quest can be turned on or off with CALL WOx or CALL WFx, respectively. Both are written as three-character CALLs so they won't conflict with a Horizon.

No compatibility problems have been associated with the Quest. It works quite happily with Horizon RAMdisks of varying size and with the AVPC card if it is present. In fact, all sorts of PEB combinations within the Hunter Valley Users Group include the Quest and no real problems have been reported.

Ease of Use: The Quest is easy to use. If you are already familiar with disk operations, you will have no trouble with Quest.

(See Page 32)

Review

REPORT CARD

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

Cost: $60 U.S. (approximate)
Manufacturer: Hunter Valley Users Group, 9 Thirlmere Pde, Tarro, New South Wales, Australia 2322
Requirements: Console, monitor or TV, disk system, 32K memory expansion optional

QUEST RAMDISK—

(Continued from Page 31)

The QUEST utility program is menu-driven and all that is necessary is to follow the on-screen instructions to load and reconfigure the DSR to your liking. The only restriction is that in a partitioned Quest neither portion can be initialized to greater than 1600 sectors. A non-destructive self-diagnostic test is provided as a menu option that can be run at any time from the QUEST program and will test both RAM and the optional 32K. All the standard disk functions are available from your favorite disk manager (i.e., file copy, delete, etc.). The only exception is that the Quest RD200 must be initialized with the QUEST utility program.

Documentation: Quest comes with four pages of documentation for the board itself and a separate document file for the AUTO program. Although the documentation file is not lengthy, it is clear and easy to read. A lengthy example of how to format Quest for the first time is included, with information on where to look should you experience a problem in one of the RAM chips — all in all, a complete and concise package.

Value: One of the biggest assets of the Quest RD200 is the fact that you don't have to buy the fully configured RAMdisk at one time. The basic board is relatively inexpensive and the components to complete it can be purchased locally at a reasonable cost. The biggest expenditure will be for the RAM chips, and even that can be done in stages as your budget allows. Since the DSR will handle any number of chips, there is no need to spend several hundred dollars at one time — a real asset if you aren't "independently wealthy."

Final Grade: I found the Quest to be easier to use than the Horizon (which I used for comparison). The initialization and configuration process was much easier to understand. In fact, I found it a little more economical than the Horizon and at least as quick in performance. Quite simply, it is one of the best and most trouble-free devices that I have seen in recent years.

In short, everything about the Quest is truly first-rate. The performance is excellent and it is easy to use. The software that comes with it is excellent, and the author, Ron Kleinschafer, supports it with updates and modifications. There is no reason this fine product should get anything less than straight-A ratings across the board. I would heartily recommend the purchase of a Quest RD200 to anyone who wants to add a RAMdisk to his system.

I would suggest, however, that you check with the Hunter Valley Users Group for a shipping schedule and the current exchange rate before you order, since the international currency rates vary from week to week.

MICRO-REVIEWS

Funnelweb 80-column upgrade, Multiplan guide get high marks

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

★ Leave it alone, back to the drawing board.

★★ Needs improvements, but workable.

★★★ A good program, worth trying.

★★★★ Send your money and buy it.

★★★

'Artoons (graphics for TI-Artist)

Here's another companion package for TI-Artist from Texaments. I don't know where they find all these computer artists, they are always superb. This time it's Jim Luque, a teacher from Washington state who has presented his outstanding talents to the community for the first time on a commercial basis. I can vouch for Jim's talent because I have seen his graphic articles and artwork many times. I'm really

glad he has decided to go world class with his work.

The set contains three disks totaling 61 Instances, many of which are almost full-screen size. They are all familiar characters as you can see by the illustration so they'll get a lot of usage by the kids as well as the poster makers and newsletter editor.

There isn't a whole lot to be said about a package like this, except that the quality is equal all the way through it and the value is excellent.

The cost is $12.95 plus $2.50 for postage and handling. Send to Texaments, 53 Center St., Patchogue NY 11772 or call the Texaments BBS at (516)475-6463 to order COD.

★★★★

Funnelweb 80-Column Upgrade

Version 4.31 (I hope I got that right — they come so fast!) now has a major new upgrade in the 80-column mode.

As you know, the last several versions have included a file called "DiskReview" that allowed you to look at any kind of

(See Page 33)

MICRO-REVIEWS—

(Continued from Page 32)

file. That function has been upgraded to include full sector editing and disk management. No kidding! It will even write files to multiple drives. Everything is handled from a beautifully windowed menu screen that is so darn simple that you probably could figure it all out without docs. Disk Review can also now be configured to come right in from the Funnelweb menu if you like, otherwise, press the space bar to bypass it.

In the sector editor,(which does everything you would expect) you get to see the hex code above and the ASCII below. Toggling between the two for editing doesn't change the screen, it switches the cursor to the appropriate window. Neat!

I would give my right arm to be able to give you some screen dumps showing this program in action, but there's no way. You're going to have to take my word for it and send Will McGrovern some money, after you get the Funnelweb system off the networks. We MUST support this man's efforts because he's the best thing this community has. His son, Tony, has already taken off for Amigaland.

Send at least $20 fairware support to Will McGovern, 215 Grinsell St., Kotara NSW 2289, Australia.

★★★

Coney Games

Barry Traver, author of the GENIAL TRAVeLER diskazine has taken a number of the games from early volumes of TRAVeLER and put them on one disk called Coney Games. Some of them have been updated a little so you can play against a friend, or, if you have no friends like me, (that's what happens when you're a cop, a teacher or a reviewer) you can play the computer, but you'd better be good at the chosen game.

The games are; three versions of "Thirty-one," "Bridge-it," (called Gale/Game on the disk) "Nimrow," "Pennytoss," "Shutout," and two versions of TicTac-Toe. All of them load from a central menu and run quickly, expected when you're a good Xbasic programmer like Barry. The graphics are bold and, I think, designed to hold the attention of the younger set for extended periods.

If you have ever considered getting the TRAVeLER, this would be a good chance for you to get a sample of that great diskazine for a cheap price, only $10 for the disk.

Send to: Barry Traver, "Coney Games", 835 Green Valley Dr., Philadelphia, PA 19128.

★★★★

Multiplan Exercises

Every once in a while a petunia rises from the onion patch. Likewise, someone rewrites the book on something and a lot of people get some real help where there was only fog before. I am speaking of Microsoft Multiplan, probably the least friendly program in all of TI-dom, and, unfortunately, still all we have for real spreadsheets. You either learn Multiplan if you have such a need, (which can be a killer) or hire an accountant. If you have to learn it, this is going to help you a lot.

I'll let Herbert Echlesinger's own words tell you the story on this fabulous effort:

"Multiplan Exercises is the result of finding a book in the local library which I thought explained the use of Multiplan in a very understandable format. It was, however, written for the PC and it was also out of print."

"Like the history professor who took five books to his mountain retreat and came back with six, I want to acknowledge that this work is a combination of the manual provided by TI; the book (library book) and much revision and testing on my part."

The disk contains a 33-page tutorial and Multiplan templates to go with it so you can practice and see what the results should look like. It is one heck of a project for our community. Don't forget, you must own the Multiplan cartridge to use the package. I might also suggest that you get RAG's Multiplan 4.0 enhancements that I mentioned a couple of months back. Between these two men, you just might stand a chance of using MP after all.

Send a disk and return postage to: Herbert Schlesinger, 27384 Strawberry Lane, Farmington Hills, MI 48018-7273

A donation is requested. I suggest $10.

TECHADVISOR ON DELPHI

Many TIers have left the networks — Genie, Compuserve, and Delphi. I believe the reason for this is that they were tired of getting tromped on by the 9640 people. (And you thought all you had to defend yourself against was IBMers) As a result, I have been invited to become a "Tech Advisor" on the Delphi network. I am a TI 99/4A man through and through so you will be able to depend on me to answer your questions and give you feedback that relates to YOUR machine.

I will also be uploading all the fairware I review here to the TI downloads, (unless an author requests otherwise) based on a two month lag time. i.e. April reviews will go up in June.

I would like to see one representative from every group in this country come on over and help me make this the best network TI sig going. The Delphi "advantage plan" makes it the cheapest network around. See their ads in MICROPendium for details. Hope to see you there.

If you would like me to review your software in this column, send it to me at 2753 Main St., Newfane, NY 14108, and if you would like it returned, include a SASE. Please help me make this an exciting column, folks, don't be shy.

User group offers chess disks

The Texas Instruments Club of Oxnard (TICO) has released Chess Traps, a monthly series of traps programmed and ready to load into the TI chess module.

According to the group, Chess Traps is designed for experienced chess players to provide practice in recognizing traps and improve strategy. Skill levels in the series range from novice to Grand Master. Each volume of Chess Traps is planned to contain at least 20 traps, with most volumes containing 30-50 traps. More than 300 traps are planned for the series.

Chess Traps, on disk, requires the Chess module, a widget and Asgard Software's Beyond Video Chess. Each volume is $5 plus $1.50 shipping. Purchasers will be advised monthly of future volumes.

Orders should be sent and checks made payable to TICO's treasurer, Charles McDonald, 2204 Calle Bellota, Camarillo, CA 93010-2348.

512K from Foundation RAMdisk

By TRAVIS WATFORD
Edited by John McKechnie

Foundation Computing produced the first RAMdisk for the TI — $270 bought the Foundation 128k card with the DSR option. The RAMdisk had serious drawbacks — it allowed a maximum of three files and could not be accessed with any of the available disk managers. On the other hand, it was fast and it was the only RAMdisk available for the TI. I was satisfied, until other RAMdisks boasting greater capacity and complete floppy compatibility hit the market. As much as I wanted one of the newer cards, I couldn't justify replacing a working, if inferior, memory card. That's how the situation remained for years. Recently, I started exploring the possibility of upgrading my present card and found that it could be done.

This article is the product of that work. While I can accept no responsibility for your results, the steps outlined below have worked for several people. The procedure is fairly simple. If you follow my instructions carefully, you should not have any problems. While I have painstakingly reviewed these instructions and feel certain that there are no mistakes, I won't be held liable for any misprints. Read the instructions carefully, pay particular attention to my descriptions of the card. If there are any discrepancies, DO NOT PROCEED. I assume that Foundation made no changes in the "REV 1" card, but if a trace or a chip is not where I say it is, STOP!

Fully upgraded, your Foundation card will run the Myarc RAMdisk EPROM used in the 512k card, giving the Foundation all of the features boasted by the Myarc card, including Myarc Extended Basic II. The Myarc software can be purchased directly from Myarc. (The Myarc EPROM will also work without this upgrade, similar to the Myarc 128K card.)

Before you begin, some basic orientation:

This article is written for Foundation 128K cards marked "REV 1." The following terms will be used when describing the Foundation card:

Top — the side of the card nearest the top when installed;

Bottom — the side that plugs into the box;

Front — the side nearest the front of the p-box when installed;

Back — the side nearest the back of the box when installed.

The card has four rows of chips labeled "A", "B", "C", and "D," with "A" at the top of the board and "D" at the bottom. Ignore the numbers printed on the board, we will number chips from front to back including positions that are drilled for IC's but are vacant. Thus A-1, A-5, B-1, C-1, and D-8 are empty slots.

The 16 memory chips are found from A-6 to A-13 and B-6 to B-13. You will be adding integrated circuits to two of the empty slots as well as utilizing unused portions of some existing chips. It is important that you always count the pins on the chips relative to the component side of the board Pin 1 is the Front, Top pin on all of the chips except C-5 and C-6. Pins are counted from pin 1 toward the Bottom. At the Bottom of the chip, go straight across and continue counting toward the Top. On a 14-pin chip, pin 1 is the Top, Front pin while pin 14 is the Top, Back pin. On chip C-6, start with pin 1 and count toward the Back. At the bottom of the chip, move across and continue counting toward the Front. I don't want to bore anyone but it is important that EVERYONE understand. You will be making connections to the following integrated circuits so make sure they are:

A-3=74LS08 A-4=74LS40 B-2=74LS74 B-5=74LS259

C-2=74LS08 C-6=TMS4500A D-1=74LS00 D-4=74LS244 C-5=2732

I recommend using a low wattage soldering iron. For the jumpers, use 30-gauge wire-wrap type wire. At the end of this article you will find a complete parts list.

PART 1 — LED FIX

The led on the Foundation card is always lit when the power is on. You can change this so that it is lights only during ramdisk access.

On the component side of the board, cut the trace to the Top lead of the led at the point where it bends to go toward the Back of the card. Solder a 2N2222A transistor into any three holes at C-1. (Emitter at top) Attach a jumper from the transistor's emitter to pin 14 at D-1. Attach a jumper from the base to pin 4 at B-5. Attach a jumper from the collector to the Top pin of the led.

The led will now only light when the RAMdisk is accessed. You may replace the led with a high-intensity one and change the resistor to a 100 ohm resistor. The color code is brown, black, brown.

PART 2 — MEMORY UPGRADE

This is more complicated than the above change, but not too bad. First, connect all of the pin 1's on the 16 memory chips together. Install a 14-pin socket at A-5. (Use the lower holes.)

—Jumper pin 7 at A-5 to component side trace. (-) (Scrape the solder resist off.)

—Jumper pin 14 at A-5 to component side trace. (+) (Scrape the solder resist off.)

—Jumper pin 1 at A-5 to pin 1 at A-6.

—Jumper pin 2 at A-5 to pin 8 at A-3.

—Jumper pin 3 at A-5 to pin 4 at A-5.

—Jumper pin 5 at A-5 to pin 10 at A-3.

—Jumper pin 6 at A-5 to pin 9 at B-5.

—Jumper pin 7 at B-5 to pin 9 at A-3.

—Jumper pin 10 at A-3 to pin 11 at A-3.

—Jumper pin 6 at C-6 to pin 12 at A-3.

—Jumper pin 7 at C-6 to pin 13 at A-3.

—Jumper pin 27 at C-5 to pin 28 at C-5.

Plug an integrated circuit, 74LS02, into the empty socket.

At this point, the board should operate exactly like it did before. Remove the memory chips and replace them with 16 new chips. The part number is 41256-15(150ns). Extreme care should be used whenever handling memory chips. Don't handle the chips until you install them. Place a sheet of aluminum foil on a table. Lay the board, component side up, on the foil and gently put the chips on the foil. Keep one hand on the foil and with the other, plug each chip carefully into the board. These simple precautions can prevent premature failure of the chips.

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User Notes

Missing Link tip

This comes from Jim Lesher, of Dallas, Texas. He writes:

This Missing Link program is for us beginners (Missing Link is an Extended BASIC upgrade distributed by Texaments). It is important to know that you are working on a grid with 192 rows and 240 columns of pixels. A sheet of graph paper with quarter-inch squares on a 81/2x11 sheet works quite well, counting six pixels per square. This will help you see exactly what numbers to use. For example, to draw a line from one point to another. A much shorter program could be written to do what this one does, but this one will be more illustrative.

```
5 !STIX
10 CALL LINK("LINE",00,120,192,12
0)
20 GOSUB 100
30 CALL LINK("LINE",30,186,162,54)
40 GOSUB 100
50 CALL LINK("LINE",96,024,096,21
6)
60 GOSUB 100
70 CALL LINK("LINE",30,54,162,186)
80 GOSUB 100
90 GOTO 10
100 CALL LINK("CLEAR")
110 RETURN
```

Thoughts on recovering from FCTN QUIT

This comes from Bill Hudson, of Reynoldsburg, Ohio. Hudson is a member of the C.O.N.N.I. User Group. He writes:

The method of recovering from FCTN QUIT is actually useless (see April 1990 User Notes). The numbers you PEEK'ed, A and LB are the address of the line number table, C and D are the address of the end of line number table and also the program area. When you hit FCTN QUIT these are set to zero. If you have a program in memory and CALL PEEK(-31952,A,B,C,D)::PRINT A,B,C,D; then press FCTN QUIT; then enter Extended BASIC and type CALL INIT::CALL LOAD(-31952,A,B,C,D); then list the program to the screen and it will be there. You must PEEK these numbers before hitting FCTN QUIT.

Each time you enter a program line these numbers change as the program changes. You would have to PEEK after entering every line. This is why I said it is useless. A simple interrupt routine to constantly copy these numbers to another area of memory, say >A000, would be simple to write. Then just PEEK -24576 and you could recover. I just thought of that method while typing this letter.

Program prints repayment schedule

The following program is by Tom Freeman of the Los Angeles 99ers. The program appeared in the group's newsletter, TopIcs. The accompanying text has been condensed from the original.

Among the many ways I have found my TI to be so useful over the years is the adaptability of BASIC. Even though I am an adept assembly language programmer, and there is certainly no way to beat the speed of assembly for large programs especially when there is a lot of screen I/O, BASIC cannot be surpassed for the ease with which one can just "figure out" something. Got a problem? Write a quick program to solve it!

The following program is illustrative of this. I wrote it so that it does much of what I used the module Home Budget Management for, and it has print capabilities. When I bought my first house I wanted a printout of the loan payments for the life of the loan. I had to send off to some companby in another city that had a mainframe computer and paid $5 (1970 dollars) for it. Here you have the same thing for free! Of course, it can be used for car loans, too.

The program has two main sections. The first calculates the size of the monthly payment (or any other frequency) based on the size of the loan and the length of the repayment period. The result is given to the next higher cent. The second section prints to the screen or a printer a table of payments based on the figures you input. Frequency of payment defaults to 1, since monthly is the most common. If you make payments on a quarterly basis, you would enter 4 here.

```
100 !  LOAN ANALYSIS PROGRAM
BY      TOM FREEMAN !242
110 F=1 :: DISPLAY AT(10,2)E
RASE ALL:"LOAN ANALYSIS AND
PRINTER": :TAB(7);"BY TOM FR
EEMAN": :TAB(7);"COPYRIGHT 1
990" !218
120 DISPLAY AT(20,1):"TYPE P
 TO PRINT PAYMENTS OR PRESS
ENTER TO CALCULATE THEPAYMEN
T" :: ACCEPT AT(24,9)VALIDAT
E("Pp"):ANS$ :: IF ANS$="P"
OR ANS$="p" THEN 210 !220
130 DISPLAY AT(1,1)ERASE ALL
:"SIZE OF LOAN":"FREQ. OF PA
YMENTS(MO) 1":"INTEREST RATE
(YR)":"NUMBER OF PAYMENTS" !
150
140 ACCEPT AT(1,14)VALIDATE(
NUMERIC):L :: LL=L :: ACCEPT
 AT(2,23)SIZE(-2):F :: ACCEP
T AT(3,19)VALIDATE(NUMERIC):
I :: ACCEPT AT(4,20)VALIDATE
(NUMERIC):N !049
150 I1=I*F/1200 !221
160 I2=(1+I1)^N !238
170 P=L*I1/(1-1/I2):: P=INT(
100*P)/100 :: PP=P :: LL=L !
108
180 DISPLAY AT(10,7):"CORREC
T? (Y/N) Y" :: ACCEPT AT(10,
22)SIZE(-1)VALIDATE("YNyn"):
ANS$ :: ANS=ASC(ANS$):: ANS=
ANS OR 32 :: IF ANS=110 THEN
 130 !248
190 DISPLAY AT(12,1):"EACH P
AYMENT IS: $";STR$(P): :"DO
THIS AGAIN A":"PRINT PAYMENT
S P":"OR STOP? S  P" :: ACCE
PT AT(16,13)SIZE(-1)VALIDATE
("PASpas"):ANS$ :: ANS=ASC(A
NS$):: ANS=ANS OR 32 !086
200 IF ANS=115 THEN STOP ELS
E IF ANS=97 THEN 130 !168
210 DISPLAY AT(1,1)ERASE ALL
:"SIZE OF LOAN";LL:"FREQ. OF
 PAYMENTS(MO)";F:"SIZE OF PA
YMENT";P:"INTEREST RATE(YR)"
;I:"HOW MANY TO PRINT";N:"NO
.DAYS TO START 0" !051
```

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User Notes

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```
220 ACCEPT AT(1,14)SIZE(-10)
:L :: ACCEPT AT(2,23)SIZE(-2
):F :: ACCEPT AT(3,17)SIZE(-
7):P :: ACCEPT AT(4,19)SIZE(
-5):I :: ACCEPT AT(5,19)SIZE
(-3):N :: ACCEPT AT(6,18)SIZ
E(-2):D !138
230 LL=L !162
240 DISPLAY AT(10,7):"CORREC
T? (Y/N) Y" :: ACCEPT AT(10,
22)SIZE(-1)VALIDATE("YNyn"):
ANS$ :: ANS=ASC(ANS$):: ANS=
ANS OR 32 :: IF ANS=110 THEN
 210 !072
250 I1=INT(I*L*D/365+.5)/100
 :: I2=I*F/1200 !110
260 DISPLAY AT(12,1):"DATE T
O START?(MO/YR) 12/89" :: AC
CEPT AT(12,23)SIZE(-2)VALIDA
TE(DIGIT):MO :: ACCEPT AT(12
,26)SIZE(-2)VALIDATE(DIGIT):
YR !210
270 DISPLAY AT(14,1):"USE SC
REEN/PRINTER? (S/P) S" :: AC
CEPT AT(14,27)SIZE(-1)VALIDA
TE("sSpP"):P$ :: IF P$="S" O
R P$="s" THEN 410 !166
280 OPEN #1:"PIO" :: PRINT #
1:CHR$(27);"N";CHR$(4)!251
290 IMAGE ##/## $######.## $
#####.## $#####.## $#####.##
 $######.## !168
300 IMAGE $####.## $####.##
$######.## !121
310 IMAGE ##/## !043
320 PRINT #1,USING 290:"MO",
"YR","CURRENT","PAYMENT","IN
T.","PRINC.","NEW. BAL." !02
8
330 FOR X=1 TO N :: IX=INT(1
00*I2*L+.5)/100 :: IF X=1 TH
EN IX=IX+I1 !112
340 YR$=STR$(YR):: IF YR<10
THEN YR$="0"&YR$ !215
350 PR=P-IX :: NB=L-PR !147
360 IF NB<0 THEN P=P+NB :: G
OTO 350 !091
370 PRINT #1,USING 290:MO,YR
$,L,P,IX,PR,NB :: IT=IT+IX :
: L=NB !216
380 DISPLAY AT(23,1):USING 3
10:MO,YR$ :: DISPLAY AT(24,1
):USING 300:IX,PR,NB !052
390 MO=MO+1 :: IF MO=13 THEN
 MO=1 :: YR=YR+1 :: IF YR=10
0 THEN YR=0 !113
400 NEXT X :: PRINT #1:"TOTA
L INTEREST";IT :: CLOSE #1 :
: STOP !035
410 PRINT "  INT.     PRINC.
 NEW BAL." !071
420 FOR X=1 TO N :: IX=INT(1
00*I2*L+.5)/100 :: IF X=1 TH
EN IX=IX+I1 !112
430 YR$=STR$(YR):: IF YR<10
THEN YR$="0"&YR$ !215
440 PR=P-IX :: NB=L-PR !147
450 IF NB<0 THEN P=P+NB :: G
OTO 440 !181
460 PRINT USING 310:MO,YR$ !
092
470 PRINT USING 300:IX,PR,NB
 :: IT=IT+IX :: L=NB !101
480 CALL KEY(0,K,S):: IF S=0
 THEN 510 !067
490 CALL SOUND(500,20000,30)
!018
500 CALL KEY(0,K,S):: IF S=0
 THEN 500 !057
510 MO=MO+1 :: IF MO=13 THEN
 MO=1 :: YR=YR+1 :: IF YR=10
0 THEN YR=0 !113
520 NEXT X :: PRINT "TOTAL I
NTEREST";IT: :"DO YOU WISH T
O PRINT? (Y/N)Y";:: ACCEPT A
T(24,28)SIZE(-1)VALIDATE("YN
yn"):ANS$ :: IF ANS$="Y" OR
ANS$="y" THEN 210 !193
```

Don't paint yourself into a corner

The following game, by Jim Ballinger, appeared in TI*MES, the newsletter of the TI99/4A User Group of the United Kingdom. The program runs in Extended BASIC and requires joysticks. A speech synthesizer is also used, but is not necessary. The program is an upgrade of a program called Paint-A-Maze by Craig Miller.

The object of the game is to not paint yourself into a corner. Using the joystick, you move a cursor around the screen in an effort to "paint" it. Obstacles are placed throughout the screen to make your job more difficult. When you are finally "trapped," you may press the fire button and will get a readout on the number of "squares" remaining to be painted.

```
5 CALL CLEAR !209
10 DISPLAY AT(6,2):"      HA
LL OF COLUMNS          —
_____" !097
20 DISPLAY AT(9,2):" PAINT T
HE HALL COMPLETELY   BUT YOU
 MAY NOT GO ONTO A   STRETCH
 ALREADY PAINTED." !097
30 DISPLAY AT(14,2):" USE JO
YSTICKS TO MOVE THE   PAINTE
R, & FIRE BUTTON TO   CLEAR
THE SCREEN." !109
40 DISPLAY AT(23,2):" ANY KE
Y TO PLAY THE GAME." !005
80 CALL KEY(0,K,S):: IF S=0
THEN 80 !148
100 CALL SCREEN(2):: CALL CL
EAR :: CALL CHAR(35,"FFFFFFF
FFFFFFFFF",42,"1C5C487F193C2
662"):: CALL COLOR(1,7,12,2,
6,6)!225
110 A$=" ##  ###   ##  ###
##   ##   #  #     ##
##       #              " ::
CALL HCHAR(24,1,35,64):: CAL
L VCHAR(1,31,35,96):: SC=469
 !117
120 CALL SPRITE(#1,42,2,177,
17):: DISPLAY AT(2,1): :A$&A
$:A$&A$:A$&A$:A$ :: Y=23 ::
X=3 !050
130 CALL JOYST(1,C,R):: R=-S
GN(R):: C=SGN(C):: IF R OR C
 THEN 150 ELSE CALL KEY(1,C,
R):: IF C=18 THEN GOSUB 170
!201
140 R=(C>3 AND C<7)-(C=0 OR
C=15 OR C=14):: C=(C=2 OR C=
4 OR C=15)-(C=3 OR C=6 OR C=
14)!150
150 CALL GCHAR(Y+R,X+C,CH)::
 IF CH>34 THEN 130 !114
160 Y=Y+R :: X=X+C :: CALL S
OUND(-90,-2,4):: CALL LOCATE
(#1,Y*8-7,X*8-7):: CALL HCHA
R(Y,X,40):: SC=SC-1 :: GOTO
130 !025
170 CALL SCREEN(12):: CALL C
HARSET :: CALL CLEAR :: DISP
LAY AT(12,2):"YOU MADE IT DO
```

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User Notes

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```
WN TO ":SC !115
178 IF SC>300 THEN CALL SAY(
"UHOH #TRY AGAIN#+USE+LESS")
:: GOTO 100 !082
180 IF SC>100 THEN CALL SAY(
"UHOH THAT+IS+NOT+GOOD"):: G
OTO 210 !227
200 IF SC=0 THEN CALL SAY("W
ELL DONE YOU+DID+IT"):: GOTO
 210 !028
205 IF SC<100 THEN CALL SAY(
"#NICE TRY#+PARTNER")!075
210 CALL CLEAR :: CALL SAY("
WANT+TO+GO+AGAIN"):: CALL SA
Y("ENTER Y OR N")!125
220 ACCEPT AT(12,16)VALIDATE
("YyNn"):Z$ !009
230 IF (Z$="Y")+(Z$="y" THEN
 GOTO 100 ELSE RUN "DSK1.MEN
U" !022
```

Inverse video for disk names

This comes from Tom Collins, a member of the NET 99ers of Fort Worth, Texas. He writes:

Get out your calculators folks, for now you can have characters or disknames in inverse video! It's easy. Just take the ASCII code of whatever character you wish to have in inverse video and add 128 to it.

For instance, the ASCII code for the letter 'A' is 65 (65+128=193). Take that sum and convert it to hexadecimal with your handy TI-35 Plus Calculator (we all have one don't we?). If not, or your calculator doesn't do conversions of number bases, you will have to do it the hard way. You now have a new hex code to use for the inverse video character.

Another method would be to add >80 to the hex code that you wish to change, IE ->41+>80=C1 for the letter 'A'.

The easiest method would be to look at the current hex code and then simply count from that number or letter in hex, such as — >41 — count for the first number only, 5 - 6 - 7 - 8 - 9 - A - B - C <— This is it! Now enter the C in place of the 4 and then write the sector back to the disk using a sector editing program. Plan carefully, writing all changes down, and practice with a junk disk first, and then have fun.

Using this process I found that changing the first letter of each command in TI-Writer is an interesting change. Also, when you make those changes in a program, only the character you change is affected, not like the BASIC code sets, speaking of which — this process will not work with BASIC or Extended BASIC programs, nor has it shown a lot of success on my Geneve, giving unpredictable results. It seems to work best on Program Image files. I have found that if you rename files with this method, the files cannot be viewed or deleted through normal means. Simply rename them using a disk editor program and then you can work with them as usual.

My son, Jeremy Collins, brought this information to light for me, and I thought we should share it with others. So try it,

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Conversion chart (ASCII—Hex—Inverse Video

Char.	ASCII Code	Hex Code	Inverse Hex	Char.	ASCII Code	Hex Code	Inverse Hex	Char.	ASCII Code	Hex Code	Inverse Hex	Char.	ASCII Code	Hex Code	Inverse Hex
space	32	>20	>A0	8	56	>38	>B8	P	80	>50	>D0	h	104	>68	>E8
!	33	>21	>A1	9	57	>39	>B9	Q	81	>51	>D1	i	105	>69	>E9
"	34	>22	>A2	:	58	>3A	>BA	R	82	>52	>D2	j	106	>6A	>EA
#	35	>23	>A3	;	59	>3B	>BB	S	83	>53	>D3	k	107	>6B	>EB
$	36	>24	>A4	<	60	>3C	>BC	T	84	>54	>D4	l	108	>6C	>EC
%	37	>25	>A5	=	61	>3D	>BD	U	85	>55	>D5	m	109	>6D	>ED
&	38	>26	>A6	>	62	>3E	>BE	V	86	>56	>D6	n	110	>6E	>EE
'	39	>27	>A7	?	63	>3F	>BF	W	87	>57	>D7	o	111	>6F	>EF
(	40	>28	>A8	@	64	>40	>C0	X	88	>58	>D8	p	112	>70	>F0
)	41	>29	>A9	A	65	>41	>C1	Y	89	>59	>D9	q	113	>71	>F1
*	42	>2A	>AA	B	66	>42	>C2	Z	90	>5A	>DA	r	114	>72	>F2
+	43	>2B	>AB	C	67	>43	>C3	[	91	>5B	>DB	s	115	>73	>F3
,	44	>2C	>AC	D	68	>44	>C4	\	92	>5C	>DC	t	116	>74	>F4
-	45	>2D	>AD	E	69	>45	>C5	]	93	>5D	>DD	u	117	>75	>F5
.	46	>2E	>AE	F	70	>46	>C6	^	94	>5E	>DE	v	118	>76	>F6
/	47	>2F	>AF	G	71	>47	>C7	_	95	>5F	>DF	w	119	>77	>F7
0	48	>30	>B0	H	72	>48	>C8	`	96	>60	>E0	x	120	>78	>F8
1	49	>31	>B1	I	73	>49	>C9	a	97	>61	>E1	y	121	>79	>F9
2	50	>32	>B2	J	74	>4A	>CA	b	98	>62	>E2	z	122	>7A	>FA
3	51	>33	>B3	K	75	>4B	>CB	c	99	>63	>E3	{	123	>7B	>FB
4	52	>34	>B4	L	76	>4C	>CC	d	100	>64	>E4	¦	124	>7C	>FC
5	53	>35	>B5	M	77	>4D	>CD	e	101	>65	>E5	}	125	>7D	>FD
6	54	>36	>B6	N	78	>4E	>CE	f	102	>66	>E6	~	126	>7E	>FE
7	55	>37	>B7	O	79	>4F	>CF	g	103	>67	>E7	delete	127	>7F	>FF

User Notes

(Continued from Page 37)

you just might like it, and find a use for this info.

For those who don't like to do conversions, I am including a list of the TI's most used characters, their ASCII code, hex code and the corresponding inverse video hex code.

The author of this tidbit accepts no responsiblity for errors or lost info due to using this process.

Stringer is author

The author of the User Note (April 1990) entitled "Formatter changer for Funnelweb and more," was inadvertently not credited. He is Charles Stringer of the Decatur 99ers.

Readers are encouraged to submit items to: MICROpendium User Notes, P.O. Box 1343, Round Rock, TX, 78680.

512K FOUNDATION RAMDISK—

(Continued from Page 34)

Once you have replaced the memory chips you will have a half megabyte of RAMdisk space. The Foundation card is mapped to CRU address >1E00 instead of the MYAC's >1000. This prevents the card from working with the Myarc controller and makes the RAMdisk unavailable if it is given the same number as an active floppy disk. The Myarc RAMdisk will "mask" a floppy with the same number. The system starts looking for disk drives at CRU address >1000. Since the floppies are at >1100 and your Foundation card is at >1E00, the system won't find the RAMdisk if it is set to the same number as an active floppy. The answer is to change the ramdisk base address to >1000, like the Myarc card.

PART 3 - CRU CHANGEFROM >1E00 to >1000

Install a 14-pin socket at B-1.

—Jumper pin 14 at B-1 to pin 14 at B-2.

—Jumper pin 7 at B-1 to component side trace. (-)

—Jumper pin 8 at B-1 to pin 13 at C-2.

—Jumper pin 9 at B-1 to pin 24 at C-5.

—Jumper pin 10 at B-1 to pin 12 at A-4.

—Jumper pin 11 at B-1 to pin 23 at C-5.

—Jumper pin 12 at B-1 to pin 4 at A-3.

—Jumper pin 13 at B-1 to pin 7 at D-4.

—Cut the trace to pin 4 at A-3. This trace can be cut between A-3 and A-4 on the component side of the board. There should be four thin traces there, cut the third from the Top.

—Cut the trace to pin 13 at C-2 on the component side of the board. The lead can be seen coming directly off the thirteenth pin.

—Cut the trace to pin 12 at A-4 on the solder side of the board. The trace can be seen coming directly off the twelth pin.

—Install a 74LS04 in the empty socket at B-1.

That's all folks. You now own a half meg RAM card ready to run Myarc's controller EPROM. Enjoy!!

PARTS LIST

Low wattage needle-point soldering iron
30-gauge wire-wrap wire
74LS02 Quad 2-Input NOR Gate
74LS04 Hex Inverter
14-pin DIP sockets (2)
2N2222A transistor
1/4 watt 100 ohm resistor
High brightness led
41256-15 memory chips (16)

The original article was published in the August 1987 newsletter of the Midlands 99'ers. It was edited in September,1989 by John McKechnie, after conversion of two Foundation 128K cards for British Columbia 99er Users' Group members. Travis Watford may be reached care of: Midlands 99'ers, P.O. Box 7586, Columbia, S.C. 29202.

John McKechnie may be reached care of: B.C. 99ER Users' Group, 216 10th Ave, New Westminster, British Columbia, Canada V3L 2B2. Or through: Delphi: JMCKECHNIE; GEnie: J.MCKECHNIE.

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