Covering the TI99/4A and the Myarc 9640

MICROpendium

Volume 7 Number 12 January 1991 $2.50

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COLUMNS

Regena reviews 10 years with the TI

☐ ☐ ☐

Jerry Stern shows you how to turn a disk directory into a disk jacket

☐ ☐ ☐

Barry Traver gives advice on screen displays in assembly

☐ ☐ ☐

Jim Uzzell on graphic routines with Myarc BASIC

ALSO INSIDE

Mike Maksimik on MIDI, music, FDOS and GDOS

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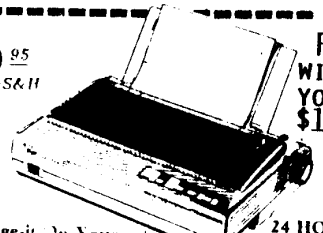

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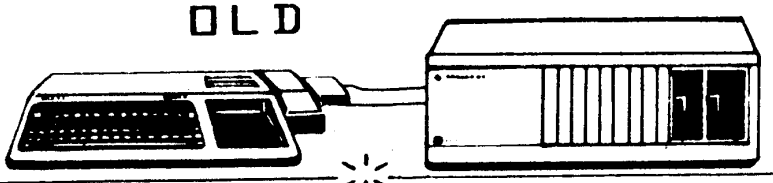

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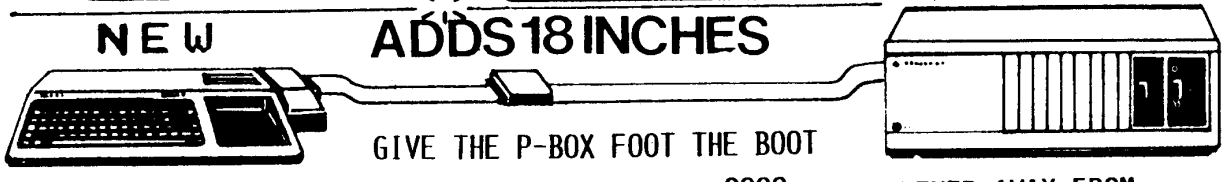

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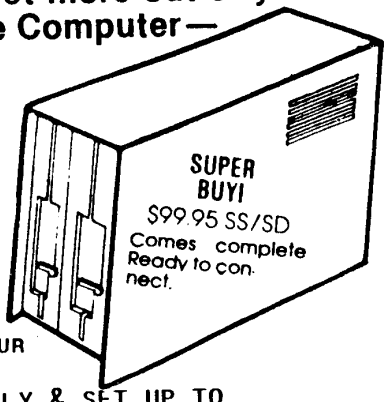

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*READ THIS

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.

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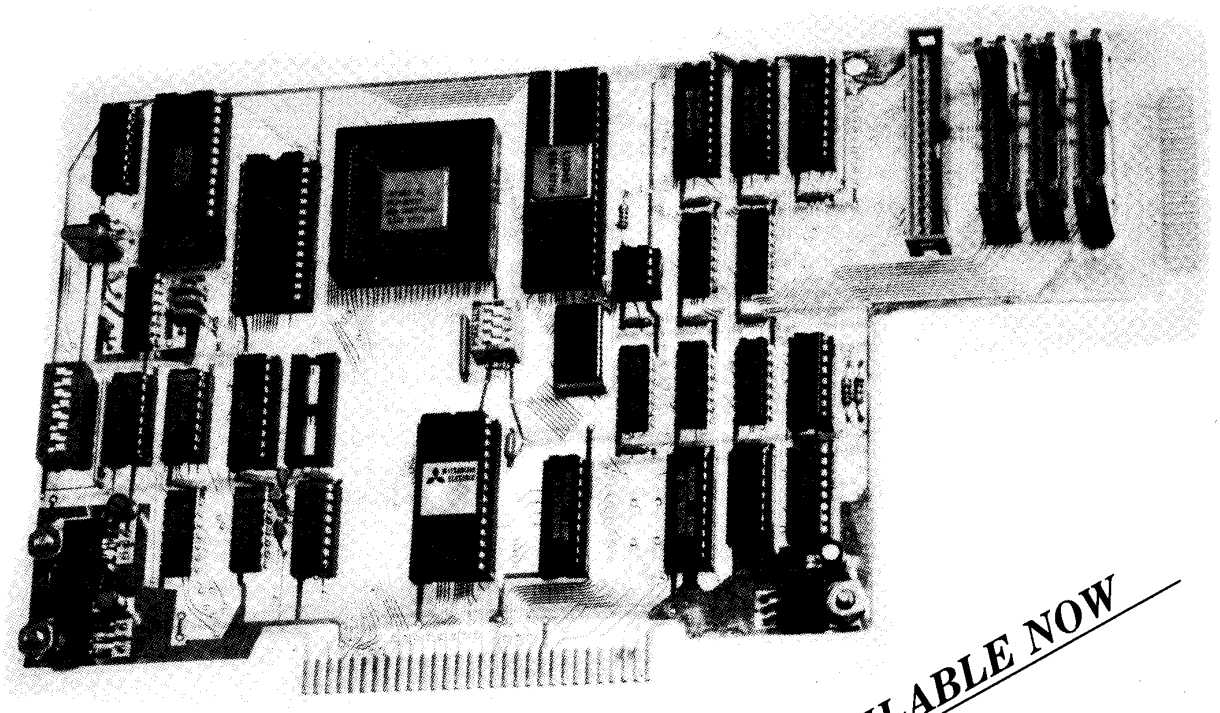

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Comments

John Birdwell leaves rich legacy

John Birdwell died on December 27, 1990 of liver cancer. John had battled the cancer for more than a year.

This news brings sadness to all TIers who ever used his fine programs or met him. Last month we published a tribute to John written by Beery Miller. It was hoped that John would survive to read it. But he didn't. The end came more quickly than any had guessed. Even so, the tribute rings true and despite his death John will continue to have an impact on anyone who uses his DiskU program. John died with many projects in the work, including an upgrade of DiskU and Myarc's Disk Manager 5. However, our sympathies go to John's family and friends. We will all miss him.

YAPP AND THE GENEVE

Last month I cautioned Geneve owners about using Yet Another Paint Program with the Myarc mouse. I reported trouble with it and recommended that they use it only with an Asgard Mouse which plugs into the serial port. Dr. Eric Bray called to suggest that the problem might be in a resistor in the Geneve card. He's seen similar problems to those that I described last month when using the Myarc mouse with MY-Art. Sure enough, the problem I reported with YAPP was also present to MY-Art. The culprit appears not to be the mouse but a resistor on the Geneve card.

COMPILERSFOR THE GENEVE

Al Beard, who developed a version of Fortran for the Geneve, has developed a program that will compile full C programs for the PC into native MDOS. At least that's how it seems to work. At any rate, users who have both a PC and a Geneve have the option of trying to convert C programs to run on the Geneve. One limitation, however, is that users are being asked to write source code for various C libraries so that the Geneve will be able to take full advantage of C programs. The days of converting and running PC programs on the Geneve are getting closer.

PASCAL RUNTIME

And speaking of converting programs fro the Geneve, work on the Pascal Runtime program for the Geneve is apparently nearing completion. I know that many Geneve users have given up on running Pascal programs on the 9640, but it appears to be actually happening. Something else to think about is the possibility of programming in Pascal on the Geneve. (Runtime is capable of running a Pascal program but won't allow users to edit or create Pascal programs.)

Apparently, when Pascal Runtime is finished, it will be possible to run a Pascal power system on the Geneve. The power system is the Pascal language and utilities, which permit users to create, edit and compile Pascal programs. Once again, in the interest of safety, readers are cautioned not to hold their breath on this. But I've gotten similar information from several readers who I regard to be very reliable and Myarc's Lou Phillips has confirmed it. And, for those who are true believers, the Pascal Runtime should also support other power systems, such as Modula 2. MICROpendium expects to have a demo copy before the end of January. Stay tuned.

Sales of Myarc's Hard & Floppy Disk Controller are apparently doing quite well, according to Lou Phillips. And, he reports, final versions of the floppy and hard MDOS are nearly ready. The HFDC, of course, works with both the 99/4A and the Geneve. The final MDOS programs will be numbered 1.15 and 1.15h.

—JK

Feedback

Not enough ink

Next November Harrison Software will not be at Chicago. We who dedicated five days to go there this year and to introduce a wholly new and unique product for the TI got far less "ink" in your magazine than those who failed to show up. It was nice to know that were "also at Chicago," but would have been nice if the fact that our Golf Score Analyzer program was shown and demonstrated there for the first ever had been mentioned.

I'll renew my subscription but the way things are presently going, G.S.A. will probably be our last product offering for the TI/Geneve community. The concentration on "gadget" hardware which few people will try to program for, and the slowing to a stop of sales has forced us to halt considering the TI as a market.

I'm now at work on making programs on my PC, where there may be enough sales to stay "in business."

We will continue to offer our existing products to the TI market, but are developing no new ones.

Bruce Harrison
Harrison Software

A review of Golf Score Analyzer is scheduled to be published in the February edition.—Ed.

Thrilled but needs an answer

Herewith my order for a subscription. I am thrilled to discover that there is still a large following for the faithful TI! Until recently I thought that I was a lone survivor riding a dead horse, now I am as happy as can be.

I am not a program writer, but am an avid and devoted user. Maybe one of your readers can help me. Back in November 1985 I laboriously typed in a program called SKYSCAPE from Compute! magazine. It ran, but had a strange quirk — the sun always rose at midnight, which I considered to be strange. I checked and checked it and checked it to no avail. I wrote to Compute! three times, but in their typical disdain for readers they never responded. Shortly after that they ceased publishing programs for the TI.

(See Page 7)

Feedback

(Continued from Page 6)

I had it on tape, but when I transferred my dozens of good programs to disk I discarded it in disgust. Now that I have found that there are so many still active TI99ers I am hoping that one of them has a working version of the program.

For a copy I would be only too happy to pay. I am looking forward to a long relationship with you (longer the better as I am fast closing in on my three score and ten).

George J. Clark
75 Aurora Ave.
Pointe Claire, Quebec
H9R 3G3 Canada

We're sorry it took so long for you to find us. But we're glad you're on board. Perhaps one of our readers can help you.

No help for CorComp?

This is in followup of a note I got from one of your people on how to get CorComp cards fixed.

To put it bluntly, YOU CAN'T.

I wrote to the people who are supposed to be able to do it, and I called them asking for a return call on their recorder. No response to either even yet.

I found someone else who was concerned about the situation and who checked out the one board and fixed it (the new one). The others are still not working.

I also found out that the people who are supposed to fix them don't have anyone they can call on to fix them, and apparently they also don't have some of the spare parts needed to do it.

In short, both Tex-Comp and the other organization are giving the TI community a big run-around.

I hope someone else will get into this business, as Tex-Comp should give me a free disk controller card for all the trouble they have caused me on this.

Keats A. Pullen Jr.
Kingsville, MD

Your experience with International Diversified Technologies, which took over CorComp Inc., is unfortunate. We have no explanation as to why However, according to other readers, the company continues to provide repair service for CorComp cards. The company can be reached at 714-956-4450.—Ed.

Geneve speed

A system comment or two: late last summer several issues of MICROpendium had feedback letters about the 99/4A vs the Geneve. Personally, I've had good support from Myarc after some initial problems in early '89; I've run without a blip for well over a year now. Obviously, they're hardly perfect; but of what I've seen in the last year, Asgard is worse for support. I've had good results with both Texaments and Tex-Comp.

One thing I don't quite totally understand is the apparent lack of interest in the value of the speed of the Geneve system. Most of the articles, comments and so on seem to imply that the Geneve is just a way to get 80 columns, so one should spend $200 or so for a PEB 80-column card. I bought the Geneve primarily for speed, and secondarily for 80 columns and the professional keyboard. The speed is a MAJOR change running programs such as TI-Base and Multiplan and also helps greatly in word processing; and at the current price (under $400) it would seem that many people, if planning to stick with TI, should take a hard look at the Geneve. Sure hard disks and RAMdisks are nice, but all they do is get the programs/data loaded. The CPU must handle it from there, and let's face it, the 99/4A is not exactly a speed burner in this department.

In simple terms of getting the job done, the Geneve speed must be considered a major factor for those wanting to the most effective TI system.

Stephen S. Bagstad
Avon Lake, Ohio

9938 clarification

Re: YAPP — Powerful drawing program aimed at 80-column market (review by Harry Brashear, Dec. 1990):

Part of Harry Brashear's review perpetuates a common error about the 9938 chip and what it can and cannot do. Presumably quoting from the manual, the review states that "four graphic modes are utilized with YAPP-Paint Pro" and proceeds to list them as:

1. 256x212 where each pixel can be any of 256 colors;
2. 256x424x256 colors;
3. 512x212x16 colors;
4. 512x424x16 colors

One and 3 correctly describe the characteristics of the G7 and G6 modes, however, modes as described by 2 and 4 simply do not exist. The 9938 can display 212 lines maximum, and that's it. I have not seen the program itself but because I have seen similar erroneous statements before and know what they were intended to convey, I am reasonably certain that whoever wrote those descriptions meant to indicate different interlace settings for the two modes. Unfortunately, whether the value of the IL (#3) bit of register 9 is zero or one, this has absolutely no effect on the maximum number of lines, which remains at 212. To state that when the interlace bit is set the resolution increases is wrong and misleading. More concisely and sensibly lthe list should state that "YAPP utilizes the following 938 graphics modes:

1. G6 (512x212, 16 colors);
2. G7 (256x212, 256 colors);

and at the user's discretion either mode may be used with interlace on or off."

This may disappoint those who were lead to believe that the 9938-based devices for the 99/4A somehow approach the same resolution as provided by VGA on the PC. I wish it were true, but unfortunately it is not.

I was involved briefly in some of the earliest stages of beta testing of YAPP and am happy to see it completed and on the market. According to the review it looks like all the features Alexander (Hulpke) was going to include made it and are working as planned. I hope that by marketing it under the Asgard label rather than relying on fairware contributions, he will reap some reward for his super effort in tackling a project of this magnitude. I am pretty sure he never did get that for his XHi and X80 utilities and it is good to know that he wasn't discouraged by the lack of contributions for those earlier efforts.

Lutz Winkler
San Diego, California

Send feedback to MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

BASIC

An anniversary column

Ten interesting years and counting

By REGENA

It has been exactly ten years since we got our first TI99/4 for Christmas of 1980. I have often said that Christmas gift changed our lives more than any other material thing we've received. My husband and I bought our first TI for about $600, so it was slightly less than the $1000 offer of earlier in the year which included the monitor. We hooked it up to our television and were excited about the color graphics and music. We also liked the command module concept for ease of use with children.

The first program I wrote on the TI was "Auld Lang Syne," designed to be RUN right at midnight with 1980 turning into 1981. That program has been updated periodically (and published). In 1981, I learned how a computer addict can get working on a program and end up doing "just one more thing" all through the night. I submitted a few programs to the 99'er Magazine and found out I could actually make money playing with my computer. I decided on the name "Regena" (my actual middle name) and worked with 99'er and met the International Users Group.

There were few TI owners in the early days, so users groups were formed and people shared information freely. We all learned a few little fun things, such as instead of CALL CLEAR, a different effect would be:

CALL HCHAR(1,1,32,24*32)
or
CALL VCHAR(1,1,32,24*32)

Quite often we would want to PRINT something without the message scrolling up the screen. There are several ways to accomplish this. One way is to change the screen to black, print the letters in black, then change the screen back to cyan.

```
100 REM SAMPLE1
110 CALL CLEAR
120 CALL SCREEN(2)
130 PRINT "HELLO": : : : :
140 FOR J=1 TO 10
150 PRINT J
160 NEXT J
170 CALL SCREEN(8)
180 GOTO 180
190 END
```

Another way is to use CALL HCHAR in a subroutine. Before you call the subroutine, specify the row R and the column C where you want the message to start. Put the message in the string M$, then call the subroutine. In this sample, the subroutine starts in Line 500.

```
100 REM SAMPLE2
110 CALL CLEAR
120 M$="THIS IS A MESSAGE."
130 R=7
140 C=4
150 GOSUB 500
160 M$="HERE IS ANOTHER."
170 R=15
180 C=6
190 GOSUB 500
200 GOTO 600
490 REM
500 FOR J=1 TO LEN(M$)
510 CALL HCHAR(R,C+J-1,ASC(S
EG$(M$,J,1)))
520 NEXT J
530 RETURN
600 END
```

I think a lot of early home computer users were excited about the graphics and non-mathematical things a computer could do. Here is a simple effect using blocks of color starting at the center of the screen.

```
100 REM SAMPLE3
110 CALL CLEAR
120 CALL COLOR(9,16,16)
130 C=1
140 FOR R=1 TO 12
150 CALL HCHAR(13-R,17-C,96,
2*C-1)
160 CALL HCHAR(11+R,17-C,96,
2*C-1)
170 CALL VCHAR(13-R,17-C,96,
2*R-1)
180 CALL VCHAR(13-R,16+C,96,
2*R-1)
190 C=C+1
200 NEXT R
210 GOTO 210
220 END
```

Stationary pictures on the TI screen were beautiful, but for games, many of us wanted moving graphics. Since the printing and CALL HCHAR and CALL VCHAR were relatively slow on the TI, programmers would come up with various ideas to try to speed up the illusion of movement. Here is one idea. A diagonal line is defined in characters, one in each of the character sets from 9 to 14. Lines 170-220 place the characters on the screen, but you don't seem them because the colors of those sets have been changed to transparent. When you press a key, lines 260-290 make the characters visible by changing the character set color, then making it invisible again.

```
100 REM SAMPLE4
110 CALL CLEAR
120 C$="010204081020408"
130 FOR S=9 TO 14
140 CALL CHAR(S*8+24,C$)
150 CALL COLOR(S,1,1)
160 NEXT S
170 CALL HCHAR(15,8,96)
180 CALL HCHAR(14,9,104)
190 CALL HCHAR(13,10,112)
200 CALL HCHAR(12,11,120)
210 CALL HCHAR(11,12,128)
220 CALL HCHAR(10,13,136)
230 PRINT "PRESS ANY KEY."
240 CALL KEY(0,K,S)
250 IF S<1 THEN 240
260 FOR S=9 TO 14
270 CALL COLOR(S,7,1)
280 CALL COLOR(S,1,1)
290 NEXT S
300 GOTO 240
310 END
```

One of my favorite uses of the TI is with sounds and music. With one statement you can actually play a chord. In some of the other computers (such as Commodore) would take several statements and tables of numbers to make one little note. Programmers have been able to make a variety of sounds on the TI, too — all sorts of effects. One thing you may enjoy trying is using FOR-NEXT loops and varying the frequencies. Use a negative number for the duration so the sound statement is executed as soon as it is reached, rather than waiting

(See Page 9)

REGENA—

(Continued from Page 8)

for the previous duration to finish. You can also try varying the volume in a FOR-NEXT loop. Then try combining frequencies with the "noise" numbers. Here is an example of sound varying in a loop.

```
100 REM SAMPLE5
110 FOR S=400 TO 200 STEP -1
0
120 CALL SOUND(-50,S,2)
130 NEXT S
140 FOR S=200 TO 400 STEP 10
150 CALL SOUND(-50,S,2)
160 NEXT S
170 GOTO 110
180 END
```

One of the main functions I have used in the TI is the random number feature — for example in choosing random numbers for educational quizzes. The following sample program illustrates random numbers in a graphic demonstration. First R(X) is defined in line 110 as a random number from 1 to X. Now everywhere in the program that R() appears, it is really a random number. Line 130 chooses random colors for the color set. Line 140 chooses a random frequency for a tone. Lines 150 and 160 choose random rows, columns, character numbers, and repetitions to place some graphics on the screen. Line 170 ends the loop so all the color sets are used, and line 180 starts the program over. Use Fctn-4 to break the program.

```
100 REM SAMPLE6
110 DEF R(X)=INT(X*RND+1)
120 FOR S=1 TO 16
130 CALL COLOR(S,R(16),R(16)
)
140 CALL SOUND(50,R(1000)+15
0,2)
150 CALL HCHAR(R(24),R(32),R
(8)+S*8+23,R(50))
160 CALL VCHAR(R(24),R(32),R
(8)+S*8+23,R(50))
170 NEXT S
180 GOTO 120
190 END
```

I looked at one of the early programs I wrote and noticed how unorganized it seemed. Through the years I have learned a few tricks and how to use subroutines and how to program more efficiently. I gradually added more and more computers as I was writing programs — I stayed with BASIC programming but with a variety of home computers as they came out. In 1982 I started writing for Compute! and my hobby turned into a business where I could really make money. I wrote six books with Compute! Books and wrote monthly articles in three of their magazines. I also wrote for several other magazines.

About the same time Texas Instruments stopped producing more TIs, many of the magazines disappeared — along with several brands of computers. Many people who were in the home computer business had quite a struggle financially. I was lucky because I have a husband who supports the family, and my income as "extra." I ignored the up-and-down computer world for awhile — and had a baby in 1985. Once again family life took over and computers were on the back burner.

In January of 1987, I started my monthly column with MICROpendium, and that has kept me in touch with the TI world.

Throughout my ten years with my trusty TI, I have been able to travel to users groups throughout the world and made some wonderful friends. I'm looking forward to going to Fest-West '91 hosted this year by the Orange County and Pomona Valley (California) user groups Feb. 16-17. The main reason I go is to revisit long-time TI friends, but I strongly encourage any TI users to go to conventions when they can to see that the TI is still going strong. New software and hardware is still being produced!

Besides the three books containing over a hundred programs specifically for the TI, I have written over 130 articles with programs just for the TI. Our "orphaned" computer is still one of the best available home computers and can do a myriad of things. I still have my original TI99/4 but use a TI99/4A for everyday work. I'm guessing this tenth anniversary is definitely not the end of an era.

EXTENDED BASIC

BASIC origami

(Or, turning a directory into a floppy disk sleeve)

By JERRY STERN
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Usually, the easiest way to write a program is to break down the activity into small steps. The steps can be written as modules, or subprograms, and tested individually, and then combined into a working program. But some tasks aren't easily broken down into sections, like programs that create specialized printouts and process the information that supplies the data for those printouts. With this type of program, it is usually easiest to first write the routine that processed the data, test it, complete it, and save it, and then add the fancy printout commands to the original code as needed.

ENVELOPE was written in that way. ENVELOPE reads disk directories and prints out disk labels and sleeves for 5 1/4" disks, with a listing of each disk's files on its own sleeve, printed four columns wide. Up to 100 files can be listed on the front of the sleeve. If there are more files on the disk than will fit on the front, the listing continues on the back. The information from one disk becomes a full page cut-out of the sleeve, preprinted with dashed lines to cut out, and dotted lines to fold. You'll need two small pieces of tape to secure the tabs on the back of the sleeve, and another piece of tape to attach the label

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to the disk.

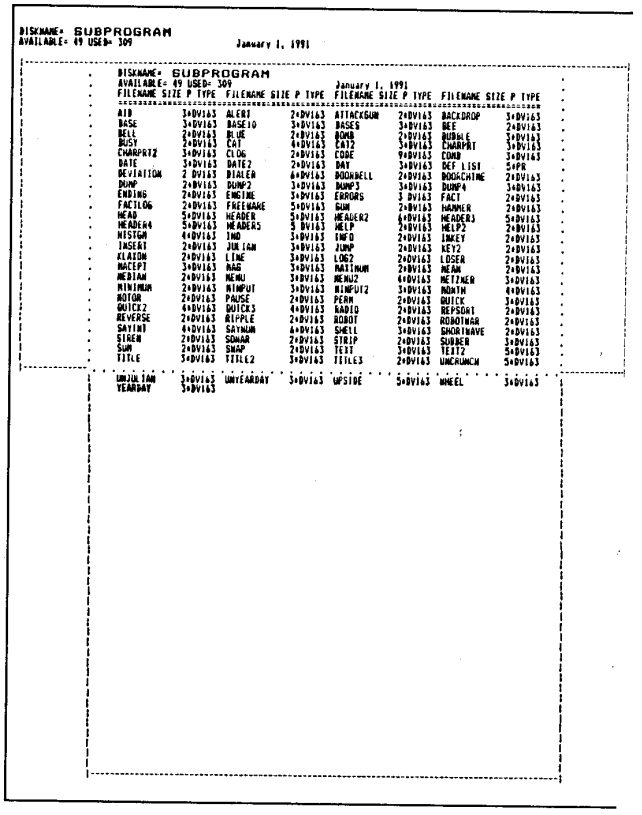
Above the disk sleeve, ENVELOPE prints a disk label with the same format as the top two lines of the sleeve header, showing the disk name, sectors available and used, and the date. If your disknames are sometimes repeated, the sectors and date should help confirm that the correct disk is matched up with the right sleeve. The label is narrow enough that a single strip of 3/4" clear tape will hold it on the disk.

The format of the listing may look familiar. It is exactly the same as the six-column listing from September's CATALOG6 program. The first column is the file name, followed by the number of sectors taken by the file, an asterisk if the file is protected, or a blank space for unprotected files, then the file types, such as Program or Display/Variable 80. The types are abbreviated as PR for Program format, D for Display, I for Internal, F for Fixed, and V for Variable.

The process of reading a disk directory is always the same, and I've described it for the programs DIR and CATALOG6. What's new is the special format of the printout. The first step of the conversion of CATALOG6 to ENVELOPE was to convert from six columns to four. Once that was done and tested, the separate steps for printing out the sleeve were added to the program.

Let's look at the original variables first. These names are the same as they were in CATALOG6. TYPE$(1 to 5) are the program types, where types one to five, in order, are Display/Fixed, Display/Variable, Internal/Fixed, Internal/Variable, and Program. A$(0) is the disk name, and A$(1 to 127) are the file names. J(0) is the total number of sectors on the disk, and K(0) the number of sectors available, or unused. Q$ and J(1 to 127) are the number of sectors used by each program. Y$ is the protection status of each file, taken from B$(1 to 127), which is the file type (Display/Variable, and so on...) of each file. A negative number for a file type indicates a protected file. D$ and K(1 to 127) are the record length for the file.

All the old variables were used for keeping track of information from the disk directories being printed. The new variables include SP$(1 or 2), for space one and two, and LE$(1 or 2), or line endings one and two. The SP$() string is the group of characters that print to the left of the directory information on the sleeve, or the cutting and folding marks. The line ending strings are the right side cutting and folding marks, and a line feed and carriage return. For those programmers entering the program manually, there are thirteen blank spaces in LE$(1) and SP$(1), and five at the end of SP$(1) and in SP$(2). If the number of spaces isn't right, the sleeve edges won't match up.



Here is how the two processes are meshed: Line 90 sets the default printer name; remember to change it to match your printer. Lines 100 to 210 are for basic set-up of the variable names and screen. In line 220, file number one is opened for the printer. The ".CRLF" is added to the printer name to stop the printer output board from adding carriage returns or line feeds to the data sent to the printer. That allows more control for layout to be exercised by the software, but requires sending carriage returns and line feeds manually at the appropriate places. The codes were included in the line ending strings, or LE$(1 or 2).

Line 230 asks for the date. Any string entered as the data will be accepted, and printed on each disk label and disk sleeve. If you like, you could use a "date" like "Shareware: Box 3" or some other identifying phrase.

The main loop begins on line 240, and will be executed once for each disk re and inventoried. Enter the drive numbe for the current disk. Lines 310 to 400 rea and print the disk name and size informa

tion, and print the label and sleeve heade Next, the loop from 410 to 440 reads a stores the file names and numbers. On ENVELOPE finishes reading the name you may safely switch disks while the pr gram is printing the sleeve.

The second loop begins at 470, a prints the file information. For each li of the listing, or every forth file, line 4 prints the line ending and space strings the top of the sleeve if less than 25 lin have been printed, or for the bottom of sleeve after the 25th line. Line 490 decid if the next line is the bottom fold of t sleeve, and prints a dotted line at t point. 510 to 540 contain the balance of directory decoding algorithm. This where the two processes overlap. The few lines of code, from 470 to 550, are d ficult because of their mixed actions. T to avoid writing code this way whene

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any other method is available. There was no option in ENVELOPE because the code that advances each line in the directory printing must also be the code that prints the borders, either for the top or the bottom of the sleeve.

Finally, the last loop begins on line 570, and prints only borders down to the bottom of the sleeve. Line 580 prints the bottom fold of the sleeve if there were few enough files for them to all fit on the sleeve front. Lines 610 and 620 restart the process. When the screen color changes from blue to green, ENVELOPE is ready to be told the next drive to read. When you've finished printing sleeves, press BACK, or function nine, to end the program.

ENVELOPE uses several special printer codes, but they are all listed in last month's compilation of EPSON printer codes. If ENVELOPE doesn't work properly on your printer, start checking the printer codes in lines 300, 330, and 360. Codes 27, 48 set the printer to eight lines per inch, code 15 starts condensed print, and codes 27, 68, 110, 0 set one horizontal tab at column 110. The horizontal tabs are used to align the right border of the sleeve; these CHR$(9) codes are in lines 390, 480, 560, and 570. Also used: code 14 sets printing width to double-wide for the disk name, and code 20 for turning off double-width printing.

Disks with more than 100 files on them are unusual; only a collection of very small files, of a few sectors each, could have so many files. For those disks, ENVELOPE prints the extra filenames on the back of the sleeve, but the bottom edges of the side tabs must be trimmed so that the tabs don't block the edges of the extra lines of type on the back.

If you have a disk that isn't full, that you are still adding to, rather than cut out and tape up a printed sleeve for that disk, cut the disk directory slightly smaller than the dotted lines and slide the listing into the old plain white sleeve with the disk. When the disk is full, print a new, complete sleeve for the disk, add a write protect tab to the disk, and file it away. For those of us who have been accumulating software and data files since 1983, these printed sleeves may be the least confusing way of keeping track of what's on our disks; there's no longer a need to keep notes stuffed into disk boxes or notebooks of printed listings; just a little BASIC origami.

ENVELOPE

```
90 PR$="RS232.DA=8.BA=4800"
! PRINTER NAME DEFAULT !168
100 ! ENVELOPE !001
110 ! FOUR COLUMN CATALOG EN
VELOPE PRINTER;JLS 1/91 !184
120 DIM A$(127),J(127),K(127
),B(127)!039
130 ON WARNING NEXT :: TYPE$
(1)="DF" !055
140 SP$(2)=RPT$(" ",14)&"|
   " :: SP$(1)="|
  .     " !217
150 LE$(2)="|"&CHR$(10)&CHR$
(13):: LE$(1)=".
 |"&CHR$(10)&CHR$(13)!057
160 TYPE$(2)="DV" !239
170 TYPE$(3)="IF" !229
180 TYPE$(4)="IV" !246
190 TYPE$(5)="PR" !250
200 CALL CLEAR :: CALL BLUE
:: CALL TITLE !082
210 DISPLAY AT(9,1):"Printer
 Name?":PR$ :: ACCEPT AT(10,
1)VALIDATE(UALPHA,DIGIT,"=."
)SIZE(-20):PR$ !106
220 OPEN #1:PR$&".CRLF",OUTP
UT,DISPLAY ,VARIABLE 132 !24
0
230 DISPLAY AT(12,1):"Today'
s Date?" :: ACCEPT AT(13,1):
P$ !097
240 DISPLAY AT(23,1):"Press
Drive # for next disk.":"  P
ress BACK when done." !243
250 CALL HCHAR(15,1,95,32)::
 CALL HCHAR(17,1,95,32):: CA
LL SCREEN(13)!154
260 DISPLAY AT(20,5)BEEP:"Re
ady for next Disk!" !097
270 CALL KEY(0,X,Y):: IF Y<1
 THEN 270 ELSE IF X=15 THEN
630 !170
280 IF X<49 OR X>53 THEN 270
 !094
290 DISPLAY AT(20,1):" " ::
CALL SCREEN(5)!141
300 PRINT #1:CHR$(27);CHR$(4
8);CHR$(15);CHR$(27);CHR$(68
);CHR$(110);CHR$(0)!175
310 OPEN #5:"DSK"&STR$(X-48)
&".",INPUT ,RELATIVE,INTERNA
L !141
320 INPUT #5:A$(0),J(0),J(0)
,K(0)!055
330 PRINT #1:"DISKNAME=  ";C
HR$(14);A$(0);CHR$(20);CHR$(
13);CHR$(10)!242
340 PRINT #1:"AVAILABLE=";K(
0);"USED=";J(0)-K(0);RPT$("
",20);P$;CHR$(13);CHR$(10);C
HR$(10)!091
350 PRINT #1:"|";RPT$("-",12
3);"|";CHR$(10);CHR$(13)!214
360 PRINT #1:SP$(1);"DISKNAM
E=  ";CHR$(14);A$(0);CHR$(20
);CHR$(9);LE$(1)!086
370 PRINT #1:SP$(1);"AVAILAB
LE=";K(0);"USED=";J(0)-K(0);
RPT$(" ",20);P$;CHR$(9);LE$(
1)!157
380 DISPLAY AT(16,1):A$(0);T
AB(11);"avail";K(0);TAB(21);
"used";J(0)-K(0)!233
390 PRINT #1:SP$(1);RPT$("FI
LENAME SIZE P TYPE  ",4);CHR
$(9);LE$(1)!124
400 PRINT #1:SP$(1);RPT$("="
,86);"    ";!027
410 FOR LOOP=1 TO 127 !148
420 INPUT #5:A$(LOOP),B(LOOP
),J(LOOP),K(LOOP)!051
430 IF LEN(A$(LOOP))=0 THEN
450 !197
440 NEXT LOOP !208
450 CLOSE #5 :: CALL SCREEN(
13):: DISPLAY AT(20,5):"You
may swap disks now." !051
460 IMAGE ########## #######
##  ########## ######### !07
1
470 FOR LOOP=1 TO LOOP-1 !03
7
480 T=32*(LOOP-INT((LOOP-1)/
4)*4-1)+1 :: IF T=1 THEN PRI
NT #1:CHR$(9);LE$(INT(LOOP/1
02)+1)ELSE 510 !197
490 IF LOOP=101 THEN PRINT #
1:"|";RPT$("-",13);RPT$(" ."
,48);RPT$("-",14);"|";CHR$(1
0);CHR$(13)!007
500 PRINT #1:SP$(INT((LOOP+1
)/102)+1);!171
510 D$=" "&STR$(K(LOOP)):: I
```

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```
F ABS(B(LOOP))<>5 THEN D$=SE
G$(D$,LEN(D$)-2,3)ELSE D$="
  " !193
520 IF B(LOOP)>0 THEN Y$=" "
 ELSE Y$="*" !167
530 Q$=STR$(J(LOOP)):: Q$=SE
G$("  "&Q$,LEN(Q$),3)!181
540 PRINT #1,USING 460:A$(LO
OP),Q$&Y$&TYPE$(ABS(B(LOOP))
)&D$ !179
550 NEXT LOOP !208
560 PRINT #1:CHR$(9);LE$(INT
(LOOP/100)+1)!180
570 FOR FIN=INT(LOOP/4)TO 62
 :: PRINT #1:SP$(-(FIN>25)+1
);CHR$(9);LE$(-(FIN>25)+1)!1
26
580 IF FIN=25 THEN PRINT #1:
"|";RPT$("-",13);RPT$(" .",4
8);RPT$("-",14);"|";CHR$(10)
;CHR$(13)!126
590 NEXT FIN !115
600 PRINT #1:RPT$(" ",14);"|
";RPT$("-",95);"|";CHR$(10);
CHR$(13)!121
610 PRINT #1:CHR$(12)! Form
feed !163
620 GOTO 240 !063
630 CLOSE #1 :: STOP !177
29505 SUB BLUE !149
29510 ! SWITCHES DISPLAY TO
WHITE ON BLUE; JLS 7/88 !230
29515 CALL SCREEN(5):: FOR L
=0 TO 14 :: CALL COLOR(L,16
1):: NEXT L :: SUBEND !202
31530 SUB TITLE !240
31535 ! SHORT TITLE SCREEN !
181
31540 DISPLAY AT(2,10)ERASE
ALL:"ENVELOPE" :: CALL CHAR(
95,"00FF"):: CALL HCHAR(3,12
,95,8)!231
31545 DISPLAY AT(6,4):"Disk
Envelope Printer" :: CALL HC
HAR(7,6,95,21)!104
31550 DISPLAY AT(4,1):"Jerry
 Stern : January 1991" !191
31560 SUBEND !168
```

BASIC Assembly

Screen displays in assembly

BASIC compiler converts XB graphic statements to A/L code

By BARRY TRAVER
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Although Extended BASIC is fine for many things, it does not excel in screen displays. Often XB has all the commands needed — CALL CHAR, CALL COLOR, CALL CLEAR, CALL HCHAR, CALL VCHAR, DISPLAY AT, CALL SPRITE, CALL MAGNIFY, CALL LOCATE, CALL MOTION, CALL PATTERN, CALL DELSPRITE — but just is too s-l-o-w in implementing them. What we need is a BASIC compiler to take XB graphics statements and convert them into equivalent assembly language source code for routines which can be accessed from XB with a CALL LINK.

Well, we have exactly that for you! It's called GRAPHICOMP (for GRAPHIcs COMPiler), and it handles all the XB statements I mentioned in the preceding paragraph (including CALL COLOR for both character sets and sprites). The program is long (92 sectors in its entirety!), so it will take two (or maybe even three) issues to print the whole program here but fortunately we'll be able to do it in a way where you can benefit and learn something as we proceed to the complete program.

In the last two issues, we dealt with CALL CHAR and CALL COLOR (for character sets). They'll also be included in GRAPHICOMP when the program is complete, but I thought this month we would concentrate on some XB statements directly involved with placing characters on the screen: CALL CLEAR (which places blank characters on the screen), DISPLAY AT, CALL HCHAR, and CALL VCHAR. Next month the emphasis will be upon sprites, i.e., creating assembly equivalents for CALL SPRITE, CALL MAGNIFY, CALL LOCATE, CALL MOTION, CALL PATTERN, and CALL DELSPRITE.

GRAPHICOMP 1.4a, the XB program printed in this issue, can be used by itself, if you confine yourself for now to working with CALL CLEAR, DISPLAY AT, CALL HCHAR, and CALL VCHAR. GRAPHICOMP 1.4a, however, is extensible (is that a word?): if you MERGE next month's XB code with what you have this month, GRAPHICOMP will have been extended to handle a much fuller set of XB graphics statements.

Here's a sample XB program that you can use to see how GRAPHICOMP 1.4 works:

```
100 DISPLAY AT(10,13)ERASE
ALL:"Yes,";
110 CALL HCHAR(23,1,42,128)
120 CALL VCHAR(1,31,42,96)
130 DISPLAY AT(12,8):"This Is
Test!";
140 GOTO 140
```

To use GRAPHICOMP, simply type in the sample XB program and LIST it to disk with a command something like this:

```
LIST "DSK1.PROGLIST"
```

(Later GRAPHICOMP will be able to handle MERGE files as well as text LISTings, but that's a topic for a later issue. Then run GRAPHICOMP, and the program will create for you assembly language equivalents for the XB graphics statements. The program is straight-forward in its operation, so I don't anticipate you'll have any problems in experimenting with it.

SCREEN LOCATIONS

It's simple to write on the screen: all you have to do is move each character

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its appropriate location on the screen. Instead of moving a character from one location in CPU RAM to another location in CPU RAM, you move it to a location in VDP RAM. The screen table in normal graphics mode occupies locations 0 through 767.

A minor inconvenience is that in assembly you can't specify rows and columns as you can in BASIC. Each position is numbered. In BASIC, you could do a CALL HCHAR(24,32,42), and that would place an asterix at row 24, column 32. Unfortunately, assembly doesn't work that way. You have to calculate the position. Since there are 24 rows and 32 columns, there are 24x32 or 768 positions in all. Instead of being numbered from 1 to 768, they are numbered from 0 to 767, since here (as elsewhere) assembly likes to start counting with 0, so row 24, column 32 would be position 767 in assembly.

The first row on the screen thus occupies positions 0 through 31, the second row positions 32 through 63, and so on. I know, you'd rather be able to specify locations on the grid by row and column (working with two dimensions) than to have to specify them by a single number (working with one dimension), since that way you wouldn't have to do the extra math, but it's not that big a deal. Besides, GRAPHICOMP figures out the math for you!

BASIC BIAS

There is one additional slightly complicating factor that comes up when you're using assembly to write to the screen from BASIC or XB. (The problem does not appear if you're writing assembly code for a program to be run from Editor/Assembler option 3 or option 5.) The problem is called "BASIC bias," and what it means is that, for example, if you want to write an asterisk to the screen, you have to write not CHR$(42) (as you would expect) but CHR$(42+96) or CHR$(138).

I'm not going to try to explain why (I'm not even sure I understand why myself): it's just something you live with if you mixing BASIC and assembly. If you're using assembly to write to the screen from BASIC or XB, you have to add 96 (or >60) to the ASCII value of the character you want to write. The code that GRAPHICOMP creates is intended to be accessed from XBASIC, so the appropriate compensation is built in, but it is something you have to keep in mind when writing your own code.

GRAPHICOMP makes use of a "write-to-screen" utility called VMBWS that works like VMBW, except that it compensates for "BASIC bias" in writing to the screen. (It's called VMBWS because it's a VMBW for the Screen.) You're welcome to incorporate this VMBWS routine in your own programs.

CALL CLEAR

The same routine to clear the screen is used for both CALL CLEAR and the ERASE ALL in DISPLAY AT(ROW,COL)ERASE ALL:MSG$. A blank space is CHR$(32) or CHR$(>20), but you'll note that you have to write CHR$(32+96) or CHR$(128) to the screen — i.e., CHR$(>80) or CHR$(>20+>60) — to compensate for "BASIC bias."

Strictly speaking, this routine isn't quite an exact counterpart to the situation in BASIC, because in BASIC you have the edge character or CHR$(31) on the borders of the screen instead of the blank character or CHR$(32), but it's a lot easier just to fill the screen completely with blank characters.

DISPLAY AT

Often we aren't aware of it in XB, but there is a difference as to whether a DISPLAY AT statement has or does not have a semicolon following. Without the semicolon, XB puts blank characters to the right of whatever is being printed. Most of the time it doesn't matter, but sometimes it does affect the graphics (as in the sample BASIC program above). GRAPHICOMP can handle this with no problem, writing different code depending upon whether or not the semicolon is there.

Incidentally, GRAPHICOMP is written so that it can even write source code for DISPLAY AT statements that contain unusual characters in the string, i.e., characters that are not alphanumeric. It is able to do this by using BYTE instead of TEXT when specifying the data to be written.

CALL HCHAR and CALL VCHAR

HCHAR and VCHAR are very similar. They are also fairly simple to implement, but not necessarily quite as simple as you might at first expect. For example, if you want to do the equivalent of a CALL HCHAR(1,3,42,2) in assembly, first you put an asterisk at position 2 (remember assembly starts counting at 0!) and then you put the next one at position 3. That is, for HCHAR, to get the next character to the right, you ordinarily just add 1 to the previous position.

It's different for VCHAR. For example, if you want to do a CALL VCHAR(1,3,42,2), again first you put an asterisk at position 2, but the position below that is position 34, i.e., 2+32. That is, for VCHAR, to get the next character below, you ordinarily need to add 32 to the previous position.

The reason the code for HCHAR and VCHAR is even a bit more complicated than that is that you also have to figure in "wrap-around" (which, again, is simpler for HCHAR than VCHAR), and you especially have to make sure that you confine your writing to the screen (rather than messing up an adjacent area of VDP RAM). But, again, GRAPHICOMP handles that with ease.

CONCLUDING COMMENTS

Next month we'll explain more about how GRAPHICOMP works, but this should be enough to get you started. I recommend that you try it out, and study the source code that GRAPHICOMP produces. (Even if you don't understand it, however, it will work, which is something nice to know!)

How can you check whether the source code that is created actually works? Well, we'll go into that more next time, but for now I suggest the following: when running GRAPHICOMP, choose option 3, and assemble the source code that is created by GRAPHICOMP. Let's assume that you've called the source code "S" and the object code "O", that the disk is in drive one, and that the CALL LINK name is "START". Here's a short program you can use to see if it actually works:

```
100 CALL INIT
110 CALL LOAD("DSK1.O")
120 CALL LINK("START")
130 GOTO 130
```

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BASIC ASSEMBLY—

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I wrote GRAPHICOMP with the intention that it be useful as a learning aid as well as a utility, so I hope you find it useful both respects. And, until next time, keep on compuTIn'!

GRAPHICOMP

```
10 GOTO 60 !139
20 DIM A$(100),B$(100)!154
30 AA$,AB,AB$,AC,AC$,AD,AF,A
F$,AG,AG$,AH,AI,AJ,AO,AP,AQ,
AR,BD,D,E,E$,EP$,G,H,J,K,O,P
,P$,Q,Q$,R,R$,S,S$,T$,V$,W$,
Z$ !008
40 CALL ACCKEY :: CALL CLS :
: CALL DECHEX :: CALL DELAY
:: CALL END :: CALL EQWS ::
CALL FB :: CALL GS :: CALL H
DG :: CALL PAUSE :: CALL PN
!110
50 CALL SCREEN :: CALL START
 :: CALL WTSU !227
60 !@P- !064
100 ! GRAPHICOMP COPYRIGHT (
C) 1991 by Barry Traver, 835
 Green Valley Drive, Philade
lphia, PA 19128 (phone: 215/
483-1379) !192
110 CALL FB(2,12):: DISPLAY
AT(1,10):"GRAPHICOMP": :"
     Version 1.4a": :"
for MICROpendium" !025
120 DISPLAY AT(7,6):"Copyrig
ht (C) 1991":"     by Barry
A. Traver":"    All Rights R
eserved!": : :"GRAPHICOMP is
 a limited XB" !089
130 DISPLAY AT(13,1):"graphi
cs compiler to help   beginn
ers to learn assembly langua
ge. Limitations: Usesimple
 graphics statements" !151
140 DISPLAY AT(17,1):"with o
nly constants (numericand st
ring) as parameters. Use an
 XB LISTing as your   input
file." :: CALL PAUSE !147
170 CALL FB(16,14):: DISPLAY
 AT(1,5)ERASE ALL:"Here are
the XB commands": :"GRAPHICO
MP 1.4a can handle:": : :" C
ALL CLEAR" !137
190 DISPLAY AT(8,1):" CALL H
CHAR(A,B,C[,D])": :" CALL VC
HAR(A,B,C[,D])": :" DISPLAY
AT(A,B)):C$[;]": :" DISPLAY
AT(A,B)ERASE ALL:C$" !120
210 DISPLAY AT(17,1):"More c
ommands will be added": :"in
 GRAPHICOMP 1.4b in next": :
"month's MICROpendium." :: C
ALL PAUSE !140
220 D,K,AR,BD=0 :: CALL FB(2
,4):: DISPLAY AT(2,1)ERASE A
LL:"Here are your choices:"
!154
230 DISPLAY AT(5,1):"1. Many
 output files, many     entr
y points (one file      for
each line number,       one
entry point for" !252
240 DISPLAY AT(9,4):"each fi
le)": : :"2. One output file
, many       entry points (a
gain,        one entry point
 for" !161
250 DISPLAY AT(15,4):"each l
ine number)": : :"3. One out
put file, one        entry p
oint (i.e., one      CALL LI
NK does it all!)" !162
260 DISPLAY AT(23,1)BEEP:"Wh
at is your choice?" :: CALL
ACCKEY(23,22,"13",E):: CALL
FB(2,12)!077
270 DISPLAY AT(7,1):"Input (
LISTing) File?": :" DSK" ::
IF E=1 THEN DISPLAY AT(15,1)
:"Output Drive (1-9)? " !127
280 IF E<>1 THEN DISPLAY AT(
13,1):"Output File? ": :" DS
K" :: IF E=3 THEN DISPLAY AT
(19,1):"Entry Point?":"":" S
TART" !096
290 ACCEPT AT(9,2)SIZE(-27):
P$ :: ON ERROR 300 :: OPEN #
2:P$,INPUT :: ON ERROR STOP
:: CALL SCREEN(12):: DISPLAY
 AT(24,1):"" :: GOTO 320 !24
3
300 ON ERROR 310 :: CLOSE #2
 !090
310 CALL SCREEN(10):: DISPLA
Y AT(24,3):"Disk Error - Try
 Again!" :: RETURN 290 !046
320 IF E=1 THEN 380 ELSE ACC
EPT AT(15,2)SIZE(-27):P$ ::
ON ERROR 360 :: OPEN #1:P$,O
UTPUT :: ON ERROR STOP !134
330 CALL SCREEN(12):: DISPLA
Y AT(24,1):"" :: CALL HDG :
 IF E=2 THEN 390 !096
340 ACCEPT AT(21,2)VALIDATE(
UALPHA)SIZE(-6):EP$ :: PRINT
 #1:"* ACCESSED BY":"* CALL
LINK(""""&EP$&""""")":"" :: GO
O 390 !046
360 ON ERROR 370 :: CLOSE #1
 !149
370 CALL SCREEN(10):: DISPLA
Y AT(24,3):"Disk Error - Try
 Again!" :: RETURN 320 !076
380 CALL ACCKEY(15,21,"19",E
B)!180
390 CALL FB(2,8):: PRINT "EX
TENDED BASIC CODE:": :!182
400 IF EOF(2)THEN PRINT "EMP
TY FILE!" :: STOP ELSE LINPU
T #2:T$ :: IF T$="" THEN 400
 ELSE 450 !072
440 IF EOF(2)THEN 670 ELSE I
INPUT #2:T$ !031
450 IF LEN(T$)=80 THEN LINPU
T #2:P$ :: T$=T$&P$ ! DV80 F
AND-AID !218
480 PRINT T$ :: D=D+1 :: A$(
D)=T$ :: B$(D-1)="L"&SEG$(T
,1,POS(T$," ",1)-1):: IF PO
(T$,"GOTO",1)<>0 THEN 440 !
45
490 AD=POS(T$," ",1):: IF SE
G$(T$,AD+1,1)="!" OR SEG$(T
,AD+1,3)="REM" THEN 440 !01
530 IF E=1 THEN 440 !179
550 IF POS(T$,"CALL CLEAR",
)<>0 OR POS(T$,"DISPLAY AT"
1)<>0 THEN BD=(BD OR 2):: G
TO 440 !160
590 IF POS(T$,"CALL HCHAR",
)<>0 OR POS(T$,"CALL VCHAR"
1)<>0 THEN BD=(BD OR 2):: G
TO 440 !132
660 GOTO 15000 ! ERROR !078
670 CALL DELAY(100):: CALL
B(2,16):: DISPLAY AT(11,11)
RASE ALL:"ENTERING": :TAB(1
);"CONVERSION": :TAB(11);"S
CTION!" :: CALL DELAY(100)!
11
680 IF E>1 THEN DISPLAY ERA
E ALL :: CALL FB(16,5):: PR
NT "ASSEMBLY CODE:":"" :: C
LL GS(BD,AR)!112
690 IF E<>3 THEN 710 !133
```

(See Page 15)

BASIC ASSEMBLY—

(Continued from Page 14)

```
00 FOR R=0 TO 1 :: PRINT #R
:"* DEFINE ENTRY POINT": :"
     DEF  "&EP$: :EP$;TAB(8
);"LWPI WS":"       B    @"&
B$(0):"" :: NEXT R !201
710 FOR Q=1 TO D :: T$=A$(Q)
:: AD=POS(T$," ",1):: S$=SEG
$(T$,1,AD-1):: Q$=S$&RPT$("
",6-LEN(S$)):: CALL FB(2,8)!
025
720 DISPLAY AT(11,1):"EXTEND
ED BASIC LINE:": :T$ :: CALL
 DELAY(100):: IF POS(T$,"GOT
O",1)<>0 THEN GOSUB 14000 ::
 GOTO 915 !176
740 AD=POS(T$," ",1):: IF SE
G$(T$,AD+1,1)="!" THEN GOSUB
 14000 :: GOTO 915 !160
750 AD=POS(T$," ",1):: IF SE
G$(T$,AD+1,3)="REM" THEN GOS
UB 14000 :: GOTO 915 !103
770 IF POS(T$,"CALL CLEAR",1
)<>0 THEN GOSUB 2000 :: GOTO
 910 !199
810 IF POS(T$,"DISPLAY AT",1
)<>0 THEN GOSUB 6000 :: GOTO
 910 !159
820 IF POS(T$,"CALL HCHAR",1
)<>0 THEN AF$="H" :: AG$="IN
C  R0" :: GOSUB 7000 :: GOTO
 910 !179
890 IF POS(T$,"CALL VCHAR",1
)<>0 THEN AF$="V" :: AG$="AI
   R0,32" :: GOSUB 7000 :: G
OTO 910 !051
900 GOTO 15000 ! ERROR !078
910 Z$="" !003
915 IF E<>3 THEN 930 ELSE IF
 Q=D THEN CALL END(5,Z$):: G
OTO 930 !187
920 FOR R=0 TO 1 :: PRINT #R
:"* BRANCH TO NEXT SECTION":
"":Z$;TAB(8);"B    @"&B$(Q):
"" :: NEXT R !162
930 NEXT Q :: IF E=1 THEN 98
0 ELSE CALL FB(2,8):: DISPLA
Y AT(12,10):"End-Of-File": :
TAB(8);"FOR INPUT FILE" :: C
ALL DELAY(100)!215
940 DISPLAY ERASE ALL :: CAL
L FB(16,5):: PRINT "ASSEMBLY
 SOURCE CODE:": :!103
960 FOR R=0 TO 1 :: PRINT #R
:"* GENERAL WRAPUP":"" :: NE
XT R :: CALL END(3,""):: IF
K THEN CALL WTSU !199
970 CALL END(24,""):!086
980 CLOSE #2 :: DISPLAY ERAS
E ALL :: CALL SCREEN(4):: DI
SPLAY AT(11,11):"FINISHED!"
:: DISPLAY AT(13,1)BEEP:"
 Another file (Y/N)?" !158
990 CALL ACCKEY(13,25,"YN",S
):: IF S THEN 220 ELSE DISPL
AY ERASE ALL :: STOP !137
2000 ! CLEAR !010
2010 CALL START(E,AB,S$,T$):
: IF E=1 THEN CALL EQWS(10)!
041
2020 CALL PN(E,S$,Z$):: CALL
 CLS(E,S$):: IF E=1 THEN CAL
L END(27,"")ELSE IF E=2 THEN
 CALL END(5,""):!157
2030 RETURN !136
6000 ! DISPLAY AT !110
6010 G=0 :: K=1 :: AD=POS(T$
,"ERASE ALL",1):: IF AD<>0 T
HEN G=1 !081
6020 AF=POS(T$,"DISPLAY AT("
,1)+10 :: AG=POS(T$,",",AF+1
):: AH=POS(T$,")",AG+1):: AI
=POS(T$,"""",AH+1):: AJ=POS(
T$,"""",AI+1)!145
6030 AP=VAL(SEG$(T$,AF+1,AG-
AF-1)):: H=VAL(SEG$(T$,AG+1,
AH-AG-1)):: AO=32*(AP-1)+(H-
1)+2 :: V$=SEG$(T$,AI+1,AJ-A
I-1)!107
6040 IF SEG$(T$,AJ+1,1)<>";"
 THEN V$=V$&RPT$(" ",28-(H+L
EN(V$))+1)!079
6050 R$=STR$(LEN(V$)):: W$="
'"&V$&"'" :: CALL START(E,AB
,S$,T$):: IF E=1 THEN CALL E
QWS(10)ELSE R=1 :: GOTO 6130
 !203
6060 FOR R=0 TO 1 :: PRINT #
R:"* TEXT FOR MESSAGE": :"T"
&Q$&"TEXT "&W$:"       EVEN"
:"" :: NEXT R !064
6070 CALL PN(E,S$,Z$):: IF G
 THEN CALL CLS(E,S$):: IF AD
<>0 THEN Z$="" !235
6080 FOR R=0 TO 1 !064
6090 PRINT #R:"* DISPLAY MES
SAGE": :Z$;TAB(8);"LI   R0,"
&STR$(AO):"       LI   R1,"&
"T"&S$:"       LI   R2,"&R$:
"       BLWP @VMBWS":"" !023
6100 NEXT R :: IF E=1 THEN C
ALL END(3,"")ELSE IF E=2 THE
N CALL END(5,"")!148
6110 IF E=1 THEN CALL WTSU :
: CALL END(8,""):: CLOSE #1
!175
6120 RETURN !136
6130 J=ASC(SEG$(V$,R,1)):: I
F J<32 OR J=39 OR J>127 THEN
 6140 :: R=R+1 :: IF R>LEN(V
$)THEN 6060 ELSE 6130 !175
6140 FOR R=0 TO 1 :: PRINT #
R:"* DATA FOR DISPLAY":"":"T
"&Q$ :: NEXT R :: AC$="
  BYTE " :: FOR P=1 TO LEN(V
$):: O=ASC(SEG$(V$,P,1))!121
6150 IF O<30 THEN O=O+128 !2
42
6160 AC$=AC$&STR$(O)&"," !00
9
6170 IF P/8=INT(P/8)OR P=LEN
(V$)THEN AC$=SEG$(AC$,1,LEN(
AC$)-1):: FOR R=0 TO 1 :: PR
INT #R:AC$ :: NEXT R :: AC$=
"       BYTE " !026
6180 NEXT P :: FOR R=0 TO 1
:: PRINT #R:"       EVEN":""
 :: NEXT R :: GOTO 6070 !046
7000 ! HCHAR AND VCHAR !144
7010 AF=POS(T$,"CALL "&AF$&"
CHAR"&"(",1)+10 :: AG=POS(T$
,",",AF+1):: AH=POS(T$,",",A
G+1):: AI=POS(T$,",",AH+1)!1
11
7020 IF AI<>0 THEN AQ=1 ELSE
 AI=POS(T$,")",AH+1):: AQ=0
:: GOTO 7040 !217
7030 AJ=POS(T$,")",AI+1)!163
7040 AP=VAL(SEG$(T$,AF+1,AG-
AF-1)):: H=VAL(SEG$(T$,AG+1,
AH-AG-1)):: E$=STR$(VAL(SEG$
(T$,AH+1,AI-AH-1))+96):: CAL
L DECHEX(E$,2)!152
7050 AA$=STR$(32*(AP-1)+(H-1
)):: IF AQ=1 THEN AB$=SEG$(T
$,AI+1,AJ-AI-1)ELSE AB$="1"
!201
7060 CALL START(E,AB,S$,T$):
: IF AF$="H" THEN AC=(32*(AP
-1)+(H-1)+VAL(AB$)>768)ELSE
AC=(AP+VAL(AB$)>24)!048
7070 IF E=1 THEN CALL EQWS(1
0)!114
7080 CALL PN(E,S$,Z$):: FOR
```

(See Page 16)

BASIC ASSEMBLY—

(Continued from Page 15)

```
R=0 TO 1 :: PRINT #R:"* WRIT
E "&AF$&"CHAR": :Z$;TAB(8);"
LI   R0,"&AA$:"      LI   R
1,>"&E$&"00" !152
7090 PRINT #R:"      LI   R
2,"&AB$:AF$&Q$&"BLWP @VSBW":
"      "&AG$ !014
7100 IF AC THEN PRINT #R:"
    CI   R0,768":"      JL
T  C"&S$:"      AI   R0,-"&
STR$(767-(AF$="H")):"C"&S$;!
064
7110 PRINT #R:TAB(8);"DEC  R
2":"      JGT  "&AF$&Q$:""
:: NEXT R :: IF E=1 THEN CAL
L END(27,"")ELSE IF E=2 THEN
 CALL END(5,"")!002
7120 RETURN !136
14000 ! REM AND ! (AND GOTO)
 !088
14010 CALL START(E,AB,S$,T$)
:: IF E=1 THEN CALL EQWS(8)!
255
14020 CALL PN(E,S$,Z$):: T$=
"* "&T$ :: FOR R=0 TO 1 :: P
RINT #R:SEG$(T$,1,80):: IF L
EN(T$)>80 THEN PRINT #R:"* "
&SEG$(T$,81,LEN(T$)-80)!017
14030 IF POS(T$,"GOTO",1)<>0
 THEN PRINT #R:"* NOT IMPLEM
ENTED!" !247
14040 PRINT #R:"" :: NEXT R
:: IF E=1 THEN CALL END(27,"
")ELSE IF E=2 THEN CALL END(
5,"")!180
14050 RETURN !136
15000 ! ERROR !045
15010 CALL SCREEN(10):: PRIN
T : :"E R R O R !": : :"An e
rror in processing has  occu
rred.  Please check the" !01
2
15020 PRINT "input file at p
oint where   the problem occ
urred." :: CALL DELAY(300)::
 STOP !149
29999 !@P+ !062
30000 SUB DECHEX(A$,A):: IF
SEG$(A$,1,1)="-" AND VAL(A$)
>-129 THEN A$=STR$(256-VAL(S
EG$(A$,2,LEN(A$)-1)))!237
30010 B=0 :: C=LEN(A$):: FOR
 D=1 TO C :: B=B+(POS("01234
56789ABCDEF",SEG$(A$,D,1),1)
-1)*10^(C-D):: NEXT D :: A$=
"" !109
30020 E=INT(B/16):: A$=SEG$(
"0123456789ABCDEF",B-
16*E+1,
1)&A$ :: IF E<>0 THEN B=E ::
 GOTO 30020 !144
30030 IF A<>0 THEN IF LEN(A$
)<A THEN A$="0"&A$ :: GOTO 3
0030 !148
30040 SUBEND !168
30050 SUB DELAY(A):: FOR B=1
 TO A :: NEXT B :: SUBEND !0
09
30300 SUB FB(A,B):: DISPLAY
ERASE ALL :: FOR C=0 TO 14 :
: CALL COLOR(C,A,1):: NEXT C
 :: CALL SCREEN(B):: SUBEND
!026
30310 SUB START(A,B,A$,B$)::
 CALL FB(16,5):: PRINT "ASSE
MBLY SOURCE CODE:": : :!111
30320 IF A=1 THEN OPEN #1:"D
SK"&STR$(B)&".L"&A$&"/S",OUT
PUT :: CALL HDG !232
30330 FOR C=0 TO 1 :: PRINT
#C:"* ASSEMBLY EQUIVALENT OF
" :: IF LEN(B$)<79 THEN PRIN
T #C:"* "&B$ :: GOTO 30350 !
142
30340 C$="* "&SEG$(B$,1,78):
: D$="* "&SEG$(B$,79,LEN(B$)
-78):: PRINT #C:C$:D$ !044
30350 IF A=3 THEN 30380 !026
30360 PRINT #C:"* ACCESSED B
Y":"* "&A$&" CALL LINK(""L"&
A$&""")":"":"* DEFINE ENTRY
POINT": :"      DEF  L"&A$
!018
30380 PRINT #C:"" :: NEXT C
:: SUBEND !221
30400 SUB PN(A,A$,B$):: B$="
L"&A$&RPT$(" ",5-LEN(A$)):
IF A=3 THEN SUBEXIT !0313041
0 FOR B=0 TO 1 :: PRINT #B:"
* PROGRAM START": :B$&" LWPI
 WS":"" :: NEXT B :: B$="" :
: SUBEND !018
30430 SUB END(A,B$):: FOR B=
0 TO 1 :: IF (A AND 1)THEN P
RINT #B:"* RETURN TO XB":""
!093
30440 IF (A AND 2)THEN PRINT
 #B:"RETURN LWPI GPLWS":"
    B    @BASIC":"" !0553045
0 IF (A AND 4)THEN PRINT #B:
B$;TAB(8);"B    @RETURN":""
!147
30460 IF (A AND 8)THEN PRINT
 #B:"      END":"" !050
30470 NEXT B :: IF (A AND 16
)THEN CLOSE #1 !191
30480 SUBEND !168
30490 SUB CLS(E,B$):: IF E=3
 THEN L$="L"&B$ ELSE L$="" !
164
30495 FOR A=0 TO 1 :: PRINT
#A:"* CLEAR THE SCREEN": :L$
;TAB(8);"CLR  R0":"      LI
  R1,>8000":"      LI   R2
,768" !154
30500 PRINT #A:"C"&B$;TAB(8)
;"BLWP @VSBW":"      INC  R
0":"      DEC  R2":"
JGT  C"&B$:"" !157
30510 NEXT A :: SUBEND !001
30520 SUB EQWS(A):: FOR B=0
TO 1 !013
30530 PRINT #B:"* XB EQUATES
":"":"BASIC  EQU  >006A":"GP
LWS  EQU  >83E0" !013
30550 IF (A AND 2)THEN PRINT
 #B:"VSBW   EQU  >2020" !207
30570 PRINT #B:"" !087
30580 NEXT B :: IF (A AND 8)
THEN CALL WS !009
30590 SUBEND !168
30600 SUB WTSU :: FOR A=0 TO
 1 !113
30610 PRINT #A:"* WRITE-TO-S
CREEN UTILITY": :"VMBWS  DAT
A VWS,VPN":"VWS    BSS  32":
"VPN    MOV  *R13,R0":"
  MOV  @2(R13),R2" !233
30620 PRINT #A:"      MOV
@4(R13),R3":"VLP    MOVB *R2
+,R1":"      AI   R1,>6000"
:"      BLWP @VSBW":"
 INC  R0":"      DEC  R3" !
217
30630 PRINT #A:"      JNE
VLP":"      RTWP":"" :: NEX
T A :: SUBEND !007
30650 SUB GS(A,B):: FOR C=0
TO 1 :: PRINT #C:"* GENERAL
SETUP":"" :: NEXT C :: CALL
EQWS(A):: CALL WS :: SUBEND
!170
30710 SUB PAUSE :: DISPLAY A
```

(See Page 17)

BASIC ASSEMBLY—

(Continued from Page 16)

```
24,1):"(Press any key to c
ontinue.)" !199
30720 CALL KEY(0,A,B):: IF B
<1 THEN 30720 !146
30730 DISPLAY ERASE ALL :: S
UBEND !167
30740 SUB WS :: FOR A=0 TO 1
 :: PRINT #A:"* DEFINE WORKS
PACE": :"WS     BSS  32":""
:: NEXT A :: SUBEND !137
30770 SUB HDG :: PRINT #1:"*
 THIS ASSEMBLY SOURCE CODE":
"*      WAS CREATED BY":"*
GRAPHICOMP (VERS. 1.4a),":"*
  AN XB GRAPHICS COMPILER" !
145
30780 PRINT #1:"*     BY BARR
Y A. TRAVER":"*  835 GREEN V
ALLEY DRIVE":"*  PHILADELPHI
A, PA 19128":"*  (PHONE:  21
5/483-1379)":"" :: SUBEND !2
52
30790 SUB ACCKEY(A,B,A$,C)::
 CALL GCHAR(A,B+2,D):: DISPL
AY AT(A,B)BEEP:CHR$(D);:: E=
0 !138
30800 CALL KEY(0,F,G):: E=E+
1 :: IF E=5 THEN CALL HCHAR(
A,B+2,30)!245
30810 IF E=10 THEN CALL HCHA
R(A,B+2,D):: E=0 !006
30820 IF G<1 THEN 30800 ELSE
 IF F>96 THEN F=F-32 !244
30830 IF F=13 THEN F=D !174
30840 IF A$<>"YN" THEN 30850
 !075
30845 IF CHR$(F)<>"Y" AND CH
R$(F)<>"N" THEN 30800 ELSE C
ALL HCHAR(A,B+2,F):: C=F ::
IF C=89 THEN C=1 :: SUBEXIT
ELSE C=0 :: SUBEXIT !243
30850 IF CHR$(F)<SEG$(A$,1,1
)OR CHR$(F)>SEG$(A$,2,1)THEN
 30800 !025
30860 CALL HCHAR(A,B+2,F)::
IF F>64 THEN F=F-64 !088
30870 IF F>48 THEN F=F-48 !1
78
30880 C=F :: SUBEND !113
```

THE TI-BASE USER'GUIDE — 8

Starting a program

By BILL GASKILL
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There are three ways available to a user to get a program up and running;

1 — run it from the SETUP file,

2 — run it from the dot prompt, or

3 — run it from another command file.

In the TI-Base applications that I have developed since 1988, I have adopted a standard for myself that does all of the program setup in a file that I always name MENU. MENU does things like setting Talk, REcnum and Heading off, it creates the color scheme that I want to use in the program being run, it displays the program name and any other messages that I want the user to see, it activates the data base(s) that will be used by the program, and in V3.0, it installs the command files into memory that I want to run faster because of their size.

All of the applications that I create are also menu-driven for ease of use. This means that the menu must reappear each time a particular portion of the system is exited. Because of the need to have the menu act as the center of program operations, another program is needed to do the setup work. Your next question no doubt is, well isn't that what the SETUP file is for. THe answer is of course yes, but with custom applications, you would have to modify your SETUP file each time you used a different one. A much more convenient method is to simply have a small command file seperate from the SETUP file to do the setup chores. That way, a user can just boot TI-Base and then type in a DO MENU, where MENU is the name of my custom setup command file, and be up and running in one command. The command file listed below does all of that for our MICROPEN application. I chose to call the "boot" command file MENU because it seemed a logical name for a routine that accessed the main system menu for the application being run.

```
* menu 06/01/90
* copyright 1990 by Wm. Gaskill
SET TALK OFF
CLEAR
SET RECNUM OFF
COLOR LIGHT-BLUE LIGHT-BLUE
SET INVERSE ON
WRITE 05,2 "*--------------------------;
-----------*"
WRITE 06,2 "|                          |  ;
          |"
WRITE 07,2 "|  MICROpendium  INDEX     |  ;
          |"  #
WRITE 08,2 "|                          |  ;
 TI-Base  |"
WRITE 09,2 "|                          |  ;
          |"
WRITE 10,2 "|   Copyright 1990 by      |  ;
 Support  |"
WRITE 11,2 "|    William Gaskill       |  ;
          |"
WRITE 12,2 "|                          |  ;
 Software |"
WRITE 13,2 "|                          |  ;
          |"
WRITE 14,2 "|  JUNCTION SOFT WORKS     |  ;
   V1.0   |"
WRITE 15,2 "|  Grand Junction, Co.     |  ;
          |"
WRITE 16,2 "*--------------------------;
-----------*"
```

(See Page 19)

TI-BASE—

(Continued from Page 34)

```
COLOR WHITE LIGHT-BLUE
SET INVERSE OFF
WRITE 21,2 "Loading. Please wait...."
INSTALL CLEAR
INSTALL ADD MENU1
INSTALL ADD ADDSCRN
USE MICROPEN
DO MENU1
```

The structure of the command file is pretty simple to follow. There are a couple of V3.0-only statements in the file however that must be removed prior to use, if you are using V2.0.

First, you must remove the two statements that SET INVERSE ON and OFF. Although the command file will run with them left in under a V2.0 environment, error messages will be displayed screaming about unrecognized directives. Similarly, the lines at the bottom of the command file start with the word INSTALL must also be removed. INSTALL is a V3.0 only feature that pokes command files into memory so that they can be run without having to go out to disk for them.

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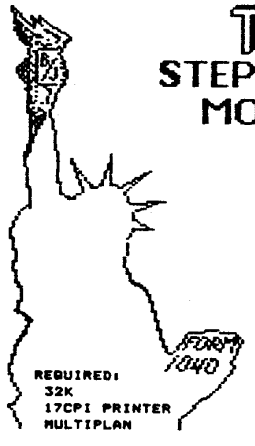

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FORM1040EZ	Income Tax Return For Single Filers w/no Dependents
FORM1040Ap1	US Individual Income Tax Return (Short Form, page 1)
FORM1040Ap2	(Short Form, page 2)
(Incl Scheds X,Y,&Z)	(These Schedules are an integral part of Form1040Ap2)
SCHEDULE1	Interest and Dividend Income
SCHEDULE2	Child and Dependent Care Expenses
SCHEDULE3	Credit for the Elderly or the Disabled
FLOWCHART	(Hints for effective order/Short Form processing)
INPUT1	(File for common data, avoids repeat entries)
INPUT2	(File for entering info on dependents)
INPUT3	(File for entering info on elderly or disabled)
PRINT17	(Printer set-up routine)
REBATES	(Form to register for rebates)
USER MANUAL	(Easy reading, covers Short forms)
WARRANTY	

LONGFORMS -- $10

FORM1040p1	US Individual Income Tax Return (Page 1)
FORM1040p2	(Page 2)
(Incl Scheds X,Y,&Z)	(These Schedules are an integral part of Form1040p2)
FLOWCHART	(Hints for effective order/Long Form processing)
INPUT1	(File for common data, avoids repeat entries)
INPUT2	(File for entering info on dependents)
PRINT17	(Printer set-up routine)
REBATES	(Form to register for rebates)
USER MANUAL	(Easy reading, covers ALL TI-Tax forms)
WARRANTY	

USUALFORMS -- $10

FORM2106p1	Employee Business Expenses (Page 1)
FORM2106p2	(Page 2)
FORM2119	Sale of Your Home
FORM2441	Child and Dependent Care Expenses
FORM3903	Moving Expenses
FORM8606	IRA Contributions, IRA Basis, and Distributions
FORM4wksheet	Employee Withholding Allowance Certificate

ADD $5 SHIPPING AND HANDLING

SCHEDULES1 -- $10

SCHEDULEA	Itemized Deductions
SCHEDULEB	Interest and Dividend Income
SCHEDULEC	Profit or Loss from Business
SCHEDULEDp1	Capital Gains and Losses (Page 1)
SCHEDULEDp2	(Page 2)
SCHEDULEDip1	Continuation Sheet for Schedule D (Page 1)
SCHEDULEDip2	(Page 2)

SCHEDULES2 -- $10

SCHEDULEEp1	Supplemental Income and Loss (Page 1)
SCHEDULEEp2	(Page 2)
SCHEDULEFp1	Farm Income and Expenses (Page 1)
SCHEDULEFp2	(Page 2)
SCHEDULER	Credit for the Elderly or the Disabled
INPUT3	(File for entering info on elderly or disabled)
SCHEDULESE	Social Security Self-Employment Tax

MOREFORMS1 -- $10

FORM1040X	Amended U.S. Individual Income Tax Return
FORM2210p1	Underpayment of Estimated Tax (Page 1)
FORM2210p2	(Page 2)
FORM3468p1	Computation of Investment Credit (Page 1)
FORM3468p2	(Page 2)
FORM3800	General Business Credit

MOREFORMS2 -- $10

FORM4562p1	Depreciation and Amortization (Page 1)
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FORM8815	Excludable US Savings Bond Interest

MIDI developer Mike Maksimik discusses music, FDOS and GDOS

The following is an edited transcript of Michael Maksimik's conference on Delphi on Oct. 7, 1990. Maksimik is a computer science student and developer of a MIDI interface for the 99/4A, the Asgard Mouse, FDOS for the 99/4A and MDOS 1.15 for the Geneve. MDOS 1.15 is a version of MDOS that supports the Asgard Mouse. Maksimik's insights into MIDI and the TI should be of interest to many TI and Geneve users regardless of their interest in producing music.—Ed.

I will begin with a short statement of what I have been doing. I have several projects in mind for the TI and Geneve.

I will start by telling you all a little about myself. I am 23 years old, 6 foot 6 inches, about 220 pounds. I am attending Illinois Institute of Technology, majoring in computer science. I expect my bachelor's degree on May 27, 1991. My work on the TI began when I was in high school and continues to this day.

I was very interested in programming and was completely self-taught up until about 1985. I bought my beige console for $49.90 from a local K-mart and slowly expanded it. The floodgates opened when I joined the Chicago TI users group. It is a wonderful source of information and inspiration and gave me a will to continue with the TI and, now, the Geneve.

I wrote a small word processor in Extended BASIC, and it needed some speed, so I learned some assembly language. This coincided with the VAX assembly language I was learning at school, and I quickly learned just how powerful the TI can be. Soon after that, I wanted to write a program that would allow me to be more compatible with the DOS environments that I have been working with over the years: CP/M, the P-system, and MS-DOS. I wanted practical experience in writing a command line interpreter.

So after building my own supercart, I wrote FDOS from scratch, inspired by Jim Derk's Megaload program. I wanted to interface all programs that I had with FDOS and have an environment to program in like the MS-DOS computers, or the Geneve, or the VAX at school. FDOS became a big project, and I spent about a week writing the code. The files that make FDOS take about 200 sectors on a disk, and all that in a week! But it didn't burn me out.

I wanted to do more with the TI — mouse support for example. I picked up an IBM serial mouse and, with a custom RS232 scanner, on my own, I figured out its encoding to make it compatible with TI Artist. Before that, I had interfaced a Radio Shack analog mouse to my ADE clock card — and that was an interesting project — but the serial mouse could be used by everyone that had a serial port. That is where the Asgard Mouse came from.

I wanted to do more with the TI — mouse support for example. I picked up an IBM serial mouse and, with a custom RS232 scanner, on my own, I figured out its encoding to make it compatible with TI Artist.

And finally, my current project bloomed about a week before the Chicago TI faire in 1989 after I bought a cheap MIDI keyboard at Montgomery Ward and got a book on MIDI. I decided to make the interface myself and write the driver software, and I wanted to surprise everyone at the faire — what a stir that caused! The phones haven't stopped ringing since then, but the MIDI system has evolved since then. Converted from Extended BASIC to assembly language in cartridge form, it is my most comprehensive programming project yet, and has required much thought and innovation to provide a memory-efficient MIDI sequencer for the TI and Geneve.

Soon, I expect a few more pet projects to become reality, and I hope to set a new standard for software production on the TI with a standard for a minimally equipped system for running next-generation software (like Telco). I hope you like my products, because I am writing them with my own uses in mind, and I am making them to satisfy the TI'er who has gone long without what other computer owners have taken for granted for so many years. The TI is a powerful machine, and must be fully exploited.

THE MIDI INTERFACE

Is there still some development room for the MIDI project — stereo or additional voices or some such?

There is more room for development on the TI MIDI because we are using a cartridge, and I still have the lower 8K to work with and still allow for 24K of tokenized music. We are trying to make a most useful sequencer, not just minimal. Without Chris Bobbitt's suggestions it would have required add-on software, even though the system is almost fully completed now. Only small things are changing now. (Bobbitt owns Asgard Software.—Ed.)

Remember, the stereo output is controlled by your MIDI keyboard, which is controlled by the TI. If your keyboard supports stereo, then it will work fully with the TI. Remember, the MIDI sound is professional, and does not come out of the monitor speaker! It comes from the keyboard's own sound generating equipment and may be directed to a stereo amplifier. MIDI is simply the "nervous system" connecting the brain of the TI with the "brawn" of the keyboard.

This serial cable is a high-speed cable in current loop fashion and simply communi-

(See Page 25)

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#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 5 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 classic 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 -A. 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! put 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 make 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 handbook 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) programmer 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 II HBM Module. HBM is a great module that can be used for many home and small business applications but II 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. Auto-listing 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. Extended BASIC req.

#35. PROGRAMMING AIDS & UTILITIES I
A collection of some unusual programs of interest to programmers. One program shows a group of opening title routines, another is a cross reference program as good as any of the commercial ones, plus a great list 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. Each separate side can be called up on screen or printer in exhibit from a menu. As good as any of the new TI computer cookbooks we have seen.

#38. GREAT 99/4A GAMES VOL. I
A collection of professional games in assembly and extended BASIC all load from a menu in exhibit. 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 famous 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 fortune-cookie 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 II. For legal reasons, it can only be distributed for backup use by owners of the original module. Do not order this disk if you have the original module and intend to use this disk only for backup purposes. Extended BASIC req.

#42. FUNNELWEB FARM UTILITY
No hoax about this one. Now owners of 9640 still can get 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 "Bitty 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. Curfax Abbey lets you actually move through a four story mansion complete with bats and suprises. The 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 room for you to add your own and point out the idiots. This one is a real challenge.

#47. INFOCOM RAPID LOADER
If you have Infocom games this is for you. Loads all II Infocom games in only 30 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 E.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 every 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)
One of the best word games we have seen for any computer. Set up like a TV game show with great screen displays.

#74. LABEL MAKER II
Make labels for holidays and special events. You compose the text and select the resident graphics for the occasion.

#75. DISK CATALOGER
Now you can organize your disk files with this great utility. Files, sorts, and prints your records. Easy to use.

#76. PROGRAMMING AIDS AND UTILITIES II
A collection of very useful material. Includes a program to convert basic to exbasic so your old basic programs will load & run in exbasic, even with graphics. Also includes two on screen diagnostic programs to test your keyboard and processor. A great merge utility is also on this disk.

#77. MICROdex 99
A database program by Bill Gaskill which files and retrieves data such as magazine articles. A sample database is included.

#78. ARTCON+ BY RAY KAZMER
ATTENTION GRAPHX AND TI ARTIST USERS!!!
This program lets you convert Exbasic graphics to TI Artist and Graphx pictures. Also contains a new MAC-RLE (2) for converting from Artist to Graphx.

#79. DM1000 V3.5
One of the most popular disk managers for the TI-99/4A. Originally a rip-off of the CorComp manager, it has been improved and refined by talented users all over the world. This version is deemed the most reliable to date and is far advanced over the TI Disk Manager II. Distributed by permission from CorComp.

#80. BIRDWELL DISK UTILITY
A must if you are into programming and software development. Besides being a great disk manager, it has provision for copying sectors, comparing files and is menu driven. Complete with documentation.

#81. HOME ACCOUNTING SYSTEM
A complete family & small business accounting system including a checkbook manager, budget analysis, mailing list and an inventory program. Complete with documentation. Easy to modify for specific needs.

#82. CROSSWORD PUZZLES
This program from Australia creates a different puzzle each time you run it. Self contained with definitions and vocabulary taken from a leading crossword dictionary. Great crossword fun.

#83. HOME APPLICATION PROGRAMS
A two disk side collection of useful programs for the home. Includes banking, cooking, home bar guide, utility records, and much much more. Something for everyone.

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#84. GALACTIC BATTLE/SPY ADVENTURE
A pair of great commercial quality games from EB Software of TI Runner fame. Galactic Battle is a space "trek" type strategy game for one or more players. Spy Adventure is an adventure game that will keep you guessing for hours.

#85. AUTOBOOT UTILITY
This utility which can be installed on a disk loads and runs or displays most files. Now you can have a disk with exbasic programs, Editor Assembler programs and TI Writer files and run or display them all from exbasic.

#86. COLUMN TEXT III V3.2
A very useful utility for printing TI Writer and 99 Writer II files in separate spaced columns. Saves hours in producing a newsletter. Complete with documentation.

#87. ARCHIVER III
This utility allows you to "pack" or combine several files into one for space utilization. A number of boards are sending files packed to save transmission costs. This utility will let you pack and/or unpack these files.

#88. AUSSIE GAMES VOL 1
A collection of games from our friends down under. Includes a great card game and board game. Hours of fun and entertainment. Includes Matchmaker & TILO.

#89. PROCALC
This is an on screen calculator for decimal/hexidecimal conversions and much more. A must for the serious programmer.

 # 90. JET CHECKBOOK MANAGER
This checkbook manager is considered the ultimate with every feature you can think of for keeping track of your checking account and keeping records of your spending for budget and tax purposes. Complete with documentation.

#91. "THE MAZE OF GROG"(St. Valentine)
Ray Kazmer has created a great maze game with fantastic graphics and the characters from his now legendary "Woodstock" disk. Fun for all!!!

#92. HOUSEHOLD INVENTORY
Written by 99/4 programming great Charles Ebninger, this prize winner originally sold for $59.95. Keeps track of household, business or personal items by category and provides automatic updating for inflation etc. A must for tax and insurance records!

#93. THE 1991 KBGB GIRLIE CALENDAR
This latest offering from programming master Ken Gilliland prints out a jumbo 12 month calendar with a knock-out centerfold pinup for each month. If you like our #14 Figure Study disk, you will flip over this one. For Adults Only!! Exbasic & d/m printer.

#94. GREAT 99/4A GAMES VOL. III
If you have seen vols. 1 & 2 of this series you know we only provide the very best. This latest volumn is also filled with a collection of great ones!

#95. WEATHER FORECASTER
The weather predictions are amazingly reliable and accurate! A great game "Lawnmower" and a mini database are also included to make this disk a fantastic value.

#96. STATISTICS & SORTING
Two great assembly utilities by John Clulow. STAT is a set of statistic routines for use in exbasic. SORT allows sorting by two separate fields and a choice of two types of sorts.

#97. MEMORY MANIPULATOR
This powerful utility lets you explore the entire memory in your 99/4A system and take apart what you find. User friendly!

#98. DAYS OF EDEN & DOORS OF EDEN
Two bible games (non-fiction) that work with the TI Adventure Module.

#99. GREAT 99/4A GAMES VOL. IV
This disk features the works of J. Peter Hoddie. All of these games are of commercial qualaity and well worth the donation requested!

#100. ASSULT THE CITY (T. of DOOM)
An exciting game for use with the Tunnels of Doom module. Several Exbasic bonus games are included.

#101. ENCHANCED DISPLAY PACKAGE
This screen enhancement utility lets you do 40 columns, windowing, reverse scrolling, clock/alarm, and a whole host of other great tricks in exbasic. Fully documented.

#102. COLOSSAL CAVES ADVENTURE
This classic adventure now available for the 99/4A is what led to the Zork series. Hours of text adventuring.

#103. SORGAN, THE 99/4A ORGAN
This program which is currently selling for big bucks on module turns your 99/4A into an electronic organ. Sound effects, different instruments and voices, chord forms, color graphics with complete control of all.

#104. C99 COMPILER AND LIBRARY
This two-sided (flippy) disk gets you into C programming with your 99/4A. Comes with a great collection of utilities such as text & graphics. (E/A)

#105. KING'S CASTLE+
A great arcade style assembly game formerly offered on module. Also includes an EB "Trek" game and a collection of sprite & graphics from Tigercub's Jim Peterson.

#106. QUEST (Dungeons & Dragons)
One of the best D&D games around! You must destroy the Dark Lord to free your homeland! Complete with documentation on disk.

#107. STAR TREK MUSIC ALBUM
Ken Gilliland's music and graphics version of the TV theme and the three motion pictures. (Exbasic)

#108. FUNLPLUS BY JACK SUCHRUE
Fantastic disk packed with Funnelweb (#42) templates, utilities and prog. to augment and configure Funnelweb. Unbeliveable collection of fantastic aids to make the best even better!

#109. TI-WRITER MINI MANUAL
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cates messages to the keyboard to tell it to turn on/off notes, to change instrument selections, rhythms, etc. — essentially anything that could be done by pressing the buttons on the keyboard to do that. Your TI will automatically do that in timed fashion, to give great musical performance.

The software specs currently are as follows:

- 16 monophonic channels available for 16 poly system
- Embedded program change
- Selective track record/play
- Dynamic program patching
- Save/load in program image format
- A music compiler that will quickly compile music "source" code into internal tokenized format, to be later saved in program image format

The compiler works flawlessly, and the major functions of the software are complete. We have decided to add a program image file loader for assembly programs, plus a menu-level enhancement loader for future expansion. In addition, you can customize the system for loading from DSK.MIDI. (volume type loading) and also screen color, delay speed, and printer port. Planned utilities include type 0 file to Cakewalk file conversion, a separate Cakewalk compiler, and music print utilities. (Cakewalk is a file-type used on PC music programs.—Ed.) The program can easily be linked to your assembly language programs because the cartridge provides most of the features of the Editor/Assembler loader and can be branched in and out of for a MIDI-level music programming shell — similar to the way a program could branch directly back to FDOS without resetting the system — requires only sector-editing of your favorite programs, like DiskU, or Telco, or Archiver. All can be interfaced with this software, so that it becomes an integral part of your development system.

Does stereo double the bandwidth requirement?

There is no bandwidth on MIDI, only serial data transfer. Bandwidth is only a function of your particular keyboard, but it is not a defined concept in MIDI.

Remember, MIDI is only a system for transporting messages, not music in any form — digitized or otherwise. MIDI simply allows you to turn on and off notes, and interface to the system easily. You don't have to know anything about music or audio to use MIDI. Just plug it into your keyboard and go. If your keyboard has stereo jacks, then plug them into your home stereo system or a mixing console and recording system — whatever you like.

I mean in the sense of serial bps rate — communication bandwidth.

The serial rate is fixed at 31,250. That is MIDI 1.0 standard. You don't have to increase communication bandwidth to get stereo. Your keyboard's sound generators produce the stereo output through its speakers. MIDI is simply a standard, like RS232, and it is non-varying throughout the industry. That is the purpose of MIDI, to provide a connecting link between drum machines, keyboards, and personal computers.

I believe that only the serious computer user would be interested in MIDI. It isn't a toy, nor is it just an interesting thing to have. It is serious, professional sequencing software.

Will MIDI files from other computers work with your MIDI system? I know you used some IBM MIDI files in your Chicago demo last year. Is there a file-type standard?

Yes, IBM MIDI files will work. They need conversion, though. The standard we defined as type 0 is the memory efficient, non-IBM-compatible style — only two bytes per note to represent the note and timer value. Cakewalk files (and others) use a 5- and 6-byte per note format which significantly cuts down the size of files to be used with the TI, but you can halve your music and have a chain of music files on a RAMdisk, for example, and can quickly load and play them. Cakewalk is known as a type 1 file, and I am working on the type 1 compiler for the TI and Geneve as a final project to finish the MIDI system.

Those keyboards that accept one-key chords — does MIDI handle that?

Yes, as long as you know the message to activate the chord. Some keyboards (like Yamaha DX7) can be programmed via MIDI to recognize a MIDI macro instruction to activate the pre-programmed steps — like multiple notes, chords, etc. But normally, as on my Casio MT240, you must tell the keyboard to play the notes individually, although they may be turned on all at once. So you can effectively do what the keyboard is built to do with a little tone recognition (by your ear) and a little programming!

Still fumbling with stereo — can you allocate two mono channels to the same device (to get stereo)?

You mean to get polyphonic? I am not talking monaural when I say mono, but "one note per channel." You have 16 channels available, and all of them can have one active note each, for a total of 16 notes at once. And the 16 notes can be further divided among the instruments of your choice, such as channels 1-5 on piano, channel 6 on bass, channel 7-11 on percussion, channel 12 on saxophone, and channels 13-16 on brass ensemble. So you can get 16-note chords.

You can even assign the channels to MIDI channels to transmit to many different keyboards or drum machines using a MIDI through box — but I meant monophonic, not monaural! Certainly MIDI does not restrict you to one note per channel. You can have many notes per channel — an infinite number.

But to implement this on the TI would require a little modification. I still could do it, if I have the idea to. A small bit would be set to indicate a string of notes to be turned on at once, within a channel, and later, all off. At their respective timer expirations....

Well, you've got my brain rolling again! I just may change the specification to allow that. I can do it with 3 bytes per note, and I can probably add a few more features. Thank you for the inspiration! It won't take long for that to happen either!

Are Commodore 64 files available as type 1?

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Well, I haven't looked at them, but I should locate some. I am willing to convert any type of MIDI file from any machine — even use the new standard MIDI for the Atari/Amiga.

You want complex music, MIDI gives you a level of professional studio production — the better your keyboard (Casio, Yamaha, Kurzweil, etc.), the better your sound! I want to get a Yamaha DX7 synthesizer and use it for future music development. My Casio MT240 allows 10-note polyphonic with up to 4 instruments at once, and it has a beautiful sound.

I use the software to assign TI channels 1-6 to play on MIDI channel 1 for a six-note poly activation. But I think I have a brainstorm idea to change that and use only one channel to assign an infinite number of notes (polyphonically) for amazing chords and intonation.

The rumor I heard around town was the MIDI for the TI would not be as great as first thought, and would be limited due to the 4A speed and memory.

Well, it is greater than first thought, but Chris Bobbitt was reading on "standard" MIDI sequencers and made the specifications known before I could even create them. He has further clarified his knowledge of what our sequencer will do, and we have made adjustments for the TI's speed and memory. For example, I thought I was unable to do much about the 8K program size constraint, but we put it in a cartridge, and now I have 16K to exploit. This allows me much more flexibility than I had, and allows even greater expansion than what I thought it would be.

I never realized the MIDI project would get this big, but we are not in the process of cutting down anything. I am adding new things all the time, and I am exploiting fully all of the TI's abilities. We still have something to talk about on a cassette-based system. That is probably the rumor, in that a cassette system would restrict the MIDI functions, but would still allow music editing, patching, and recording.

My system requires disk, 32K, RS232 and the MIDI software. System enhancements only provide further versatility.

Is that limit cassette I/O or memory?

Cassette I/O. Naturally, the more memory you have, the more music you can store. But in perspective, the 24K portion of the TI used to store music will provide plenty of versatility — about 12,000 notes worth! Most songs use less than 3,000 notes, some concertos use close to 10,000. An overture like "Poet and Peasant" can be split into three sections or movements, where a slight pause is natural — and the system can automatically load the next movement from disk

> **... the new version (of FDOS) is conceptualized as a graphic interface, reminiscent of GEOS for the Commodore. I am researching the steps necessary to do this for the TI, and Asgard Mouse compatibililty, but it is all on the drawing board now (for GDOS 5.0).**

So a console with 32K on-board plus cassette wouldn't be too bad?

Not really. You could have loading and saving to cassette of music (in program image format) and scanning the MIDI port for keypresses and recording music. You would not be able to use the compiler though. It uses D/V80 files, which are illegal on cassette. But you don't have to compile every time — just once — and then save the music in program format. CSI access requires GPLLNK, so I will have to write my own.

RAMdisks are used just as that, a RAMdisk, and they provide instant loading and saving of music files, for nearly uninterrupted music. A 256K RAMdisk with MIDI files on-board would probably provide playing for about 10 hours. You can page in the music files just as you would from floppy.

If you could shoehorn a small RAMdisk into your cartridge, the cassette system would be pretty good. Or maybe a side-port cart would provide more options.

Well, that is up to Chris. I can support a cartridge RAMdisk, but I don't know wh[at] that would do to the price of the system. I can custom-write the software for unusal system combinations (if you wanted to modify the MIDI cartridge). It's only an 8K EPROM, you know. That will be arranged through Asgard, but I can do requests, after the MIDI master cartridge is out. Remember, I am only doing the software. I don't have cartridges, and I only have one EPROMmer. Chris is doing the cartridges and the cables, and he must ultimately decide what to do. Remember, even cassette users have possibilities, like the 32K/RS232 standalone by Multicom. It would be ideal for cassette, but I would still strive for the disk standard.

8K RAM is in the cart, also, isn't it? I thought you said 16K awhile back.?

I believe that only the serious computer user would be interested in MIDI. It isn't a toy, nor is it just an interesting thing to have. It is serious, professional sequencing software. 8K cartridge, plus 8K lower memory expansion bank. That is what I am using to hold the program. Upper 24K is used for music storage, and VDP RAM is used for buffers. So that is 16K total program usage, 24K data usage, 16K buffer and screen.

Okay, not using the 16K cartridge banking.

Right, Chris has an excess of 8K boards that he will be using conveniently for this project.

Which keyboards are currently supported in the software package?

All keyboards are supported which have the MIDI IN and MIDI OUT "DID" plugs — ALL Keyboards!

Would it be possible to put the MIDI software directly on an RS232 EPROM to have a dedicated MIDI system that can use the cartridge port for something else?

Well, if you substituted the EPROM value of 110 baud to the value for 31,250, you could have a dedicated MIDI system that could use TI's existing file system to access MIDI using the DSR, but it isn't fast enough for me! I prefer direct load of MIDI data instead of going through the DSR to do it. My code is much faster, and

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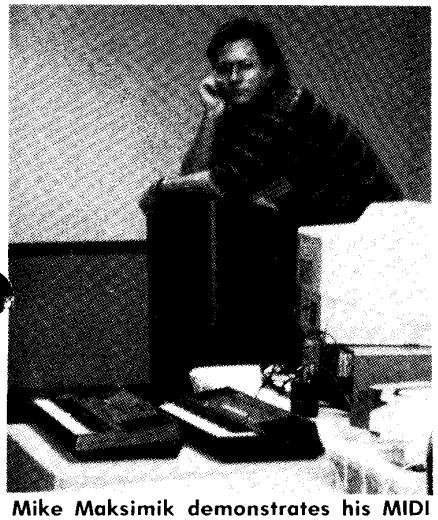
synchronous. The DSR cannot handle the timing of note on/off pairs so you must do that within your program. But MIDI DSR is possible, and probable. I never use 110 baud, and I would be willing to make the change — requires ripping out the ROM in the RS232 and substituting the.ROM for an EPROM.

I meant throw out the RS232 DSR, and just put the cartridge EPROM on the RS232 card instead.

The cartridge ROM could be adapted for the RS232 card, but then you wouldn't have access to that card for other uses such as modem or Asgard Mouse.



Mike Maksimik demonstrates his MIDI system at the 1990 Chicago TI Faire.(Photo courtesy of Gary Cox)

Put it at the second RS232 address. (I have 3 RS232's anyway.)

OK. Well, I am sure that 2 RS232 cards will soon be a common thing. MIDI allows selection of ports 1-4. All disk access would have to be located off-card. It would be designed similar to P-code card, and would take control upon powerup. (It wouldn't allow menu options on beige consoles!)

Those who have a cassette system and standalone RS232, they could change the RS232 EPROM to a MIDI EPROM, and put in an 8K RAM cartridge. Makes for a cheap MIDI system.

I know of a better system, a standalone RS232 and a 64K RAM cartridge (like George Bowman's) with MIDI system on cassette (requires a separate loader, though, plus no hardware modifications and an un-permanent alteration to the RS232. A cassette user would not have the technical know-how to do such a project. It is possible, but I would not recommend the user do it. It would be better to leave the RS232 as it is, and use software by the present method of access that is provided, cartridge and disk, to fully access the system.

THE ASGARD MOUSE

Okay, let's move to the Asgard Mouse and MDOS support. How is MDOS 1.15 coming along?

MDOS 1.15 is the planned Asgard Mouse support version. I am writing the patch driver to allow use of Asgard Mouse in MDOS. You use the Video XOP's to access the Asgard Mouse information, just as you do with Myarc Mouse. This is necessary for the Geneve if you choose to go 9958 video — it does not allow a mouse on the video color bus. So you must use a mouse from somewhere else.

I have all of the necessary tools to do this, and it is the project after MIDI. I am using MDOS 1.14F, but I have a good source for the information from Myarc. There is c99 support for the mouse now, and I anticipate supporting the MDOS windows program (by Beery Miller), if it correctly accesses the video XOPS. This will be supplemental software for the purchasers of Asgard Mouse. It will interface to the Geneve in a remarkably similar way to the way it interfaces to the IBM clones using a patch device driver.

FDOS AND GDOS FOR THE 99/4A

What are the features of FDOS?

FDOS is a DOS-like environment. Version 2.0 is the current version, soon to be updated. It runs from a RAM device at >6000 to >7FFF and requires an E/A GROM in the cartridge port (a Super Space cartridge). It provides full parsing of command input and has a series of internally implemented DOS commands: CLS, VER, PRINT, TYPE, FORMAT, etc. Commands can be external, and the system supports a printer. It is easy to modify, and the current version of FDOS

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TOURNAMENT SOLITAIRE

This package is a collection of not one but seven popular variations of Solitaire, including: *Golf, Pyramid, Klondike, Canfield, Calculation, Pile Up* and *Corners*. Each of these games can be played individually, or one after the other in a tournament where the score from one is passed onto the next. Fast game-play and well-defined graphics mean you'll never have to wait for the computer or try to figure out what your hand is. Keep high scores in the game and compete with yourself or your friends. *Tournament Solitaire* includes a lengthy manual along with game hints. By William Reiss. Extended BASIC, 32K and a disk system required.

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P.O. Box 10306
Rockville, MD 20849
(703)255-3085

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is public-domain. FDOS will execute D/F80 code, D/V80 batch files (autoexec type files) and program image files. The code is re-entrant and can provide a shell for programmers. Instead of executing a BLWP @>0000, substitute a B *R11 or a BLWP @>6010 to branch directly back into FDOS. It can be expanded with memory devices and extended supercarts. It will probably be made into a ROM cartridge for the new version, and will be marketed by Asgard at a nominal price. Asgard has lots of EPROM cartridges, I have none. And the new version is conceptualized as a graphic interface, reminiscent of GEOS for the Commodore. I am researching the steps necessary to do this for the TI, and Asgard Mouse compatibililty, but it is all on the drawing board now (for GDOS 3.0).

Will the graphics interface mean dropping the external terminal capability?

Probably. External terminals cannot support the TI's graphics system, but I want to explore the external terminal system on a sublevel and still make it available as a "remote host" for your TI. A disk manager and terminal emulator that asks for passwords over a modem line or terminal, and provides access to your disk system remotely. I don't have a graphic terminal, just an 80-column display device (RS232), and it was a nice experiment in development. It still may have uses for that type of thing — certainly for the Geneve — but programs executing over the RS232 are up to you. It severely cuts your graphic and mouse capabilities and does not allow icons.

An 80-column terminal plus FDOS is a cheap way to get 80-columns! $40-50 for a good terminal.

That is true, and that is what its intention was!

MY-BASIC

Using graphics routines in MY-BASIC

By JIM UZZELL
DDI SOFTWARE

This month's article is for programmers. If you are not a programmer or you don't care about programming techniques then skip this article.

This article assumes you are using MY-BASIC 2.99A and MDOS .97H.

Type in the program below and run it. What follows is an explanation of the program.

Line 1 — Put program in Hi-Res mode.

Line 2 — Define that portion of the screen that is not accessable by Print or Display statements to color 4.

Line 3 — Define char 255. Note that I have used FC instead of FF to create a solid block. The reason for doing this is that in MODE 3,3, pattern size is a 6x8 grid.(See Appendix K page 251 of manual). I am also setting up the color of char 255 to be black on a blue background.

Line 4 — Use HCHAR to display char 255 80 times.

Line 5 — Dimension variable A for use in line 10.

Line 6 — Use CALL POINT to draw a line of pixels across the screen. It is important here to point out what is being done. First, I am defining each pixel to have color 9, forget the 5 for background (necessary for proper syntax but it is not active). Second, I am starting at pixel-row 96 (12th row x 8 pixels per character), which is intended to be the same as row 12 in line 4 above, but look where it drew the line. What this means is, using POINT, DRAW, DRAWTO, RECTANGLE with PRINT, DISPLAY, or any statement that displays chars will have to be adjusted to match the chars, i.e. put a rectangle around a menu list. Now, look at first value of pixel col X, it is 17, but starts displaying at the same position as col 1 of line 4. This means that there are 480 pixels from the first column of the character in a display at (x,1) to the last column of a display at (x,80).

```
oOOOOO          OOOOOo
oOOOOO          OOOOOo
oOOOOO          OOOOOo
o  1              80  o
oOOOOO          OOOOOo
oOOOOO          OOOOOo
oOOOOO          OOOOOo
oOOOOO..TO..OOOOOo
```

Line 7 — Define char A as red (7) with lt. green (4) background. Set up the display of anything else as white (16) chars with blue (5) background.

Line 8 — Starts a loop to grab the color of each pixel of char A and put that value in a variable (see GCHAR Hi-Res mode for explanation of GPOINT).

Line 9 — Is the get point color routine.

Line 10 — Displays the color values of char A from top to bottom, remember it is a 6x8 pattern. Look at the position of the 7's (the color of A in line 7) in column of numbers on the left of the screen.

Line 11 — This is to show that these variables are ASCII 4 and 7, not ASCII 52 (4) and ASCII 55 (7).(To see a list of ASCII 0-30 see page 146 of TI-Writer manual.)

Line 13 — This starts another loop which will use information in the variables of A(Z) to display a duplicate of A below the original A. It should be noted here that this A has NO character pattern.

Line 17 — Displays the values of Last Point Referenced command. I believe this command has a bug because it does not agree with last CALL POINT.

Line 19/20 — Displays the hex and binary values of char A. If you compare the 1's in binary string to the 7's in list on the

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MY-BASIC—

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left they are in the same position.

Line 21 — Shows the difference in using row in hchar(line 11) and pixel-row in call point. row=15 vs pixel-row=113 (not 15x8). The Default Charset in MY-BASIC uses the first column of each character as part of space separation between chars (look at how Char A is displayed on the black line).

Line 22 — Resets default colors for foreground and background.

Those of you that would like to have other commands explained or demonstrated can write in your requests to MICROpendium.

FOR THE HACKERS

Here's one for you hackers — What are the parmeters for the commands Inp, Outp and Pset?

```
1 CLS :: CALL GRAPHICS(3,3)
2 CALL ECOLOR(4)
3 CALL TCOLOR(2,5) :: CALL C
HAR(255,"FCFCFCFCFCFCFCFC")
4 CALL HCHAR(12,1,255,80)
5 DIM A(64)
6 CALL DCOLOR(9,5) :: FOR X=
17 TO 496 :: CALL POINT(1,96
,X) :: NEXT X
7 CALL TCOLOR(7,4) :: DISPLA
Y AT(12,40):"A"; :: CALL TCO
LOR(16,5)
8 Z=1 :: FOR Y=1 TO 8 :: FOR
 X=1 TO 6
9 CALL GPOINT(88+Y,X+250,A(Z
))
10 DISPLAY AT(14+Y,27+X):STR
$(A(Z));
11 CALL HCHAR(14+Y,39+X,A(Z)
)
12 Z=Z+1 :: NEXT X :: NEXT Y
13 Z=1 :: FOR Y=1 TO 8 :: FO
R X=1 TO 6
14 CALL DCOLOR(A(Z),5)
15 CALL POINT(1,100+Y,X+250)
16 Z=Z+1 :: NEXT X :: NEXT Y
17 CALL LPR(M,N) :: DISPLAY
AT(13,50):"LPR=";"ROW";M;"CO
L";N;
18 DISPLAY AT(14,50):"LAST C
ALL POINT";((Y-1)+100);((X-1
)+250)
19 CALL CHARPAT(65,C$) :: DI
SPLAY AT(15,50):"PATTERN OF
CHR A"; :: DISPLAY AT(16,50)
:"HEX  BINARY"
20 Y=0 :: FOR X=1 TO 16 STEP
 2 :: READ D$(Y) :: DISPLAY
AT(17+Y,50):SEG$(C$,X,2);"
";D$(Y) :: Y=Y+1 :: NEXT X
21 FOR X=1 TO 60 :: CALL POI
NT(1,113,250+X) :: NEXT X
22 CALL TCOLOR(16,5)
23 CALL KEY(0,K,S) :: DISPLA
Y AT(5,33):"ANY KEY TO EXIT"
 :: IF S=0 THEN 23
24 END
25 DATA 00111000,01000100,01
000100,01111100,01000100,010
00100,01000100,00000000
```

CHECKSUMS

0 1623 983 3321 1379 587 4100 3815 2135 1801 2157 1681 1703 2179 1314 1621 1707 3672 3544 4823 1058 4583 1654 3079 1196 4411 381 3847 TOTAL 64354

CHECKtrack

For TI Base

Did you ever feel out of touch with your checkbook? Sure, that may sound like a silly question, but think about it. If you're like most people, your checkbook is the heart of your finances. Month after month, year after year, you put money into your checking account then turn right around and start writing checks against it. Now just think about all of the juicy information you have stored in your check book. A large chunk of your financial history (if not all) is stored in there, and it's totally unorganized. Enter CHECKtrack.

CHECKtrack is a powerful checking account database that puts you in touch with the information stored in your checkbook. With it you can easily track the flow of your checks and deposits without paging through your entire checkbook. What a dream that would be! Quickly locate transactions, summarize your account history, print monthly or year-to-date reports, find payments by category and create custom queries. With CHECKtrack it's easy -- and unlike your unorganized checkbook, it never keeps you in the dark.

Only $14.95

TEXAMENTS

53 Center Street, Patchogue, New York 11772

Please add $3.00 for domestic first class (and Canadian) delivery, $8.00 for foreign air mail delivery. Sorry, no credit card orders accepted.

TI Base v3.0 (or later) is required to operate CHECKtrack. TI Base may be purchased from Texaments for only $24.95 plus shipping.

HORIZON COMPUTER

HORIZON BARE BOARD, Manual + ROS8.14 $45
Zero K Kit=ALL parts, less Memory $105
128k Memory chips $45 each, 32k chips $8
128k Kit=$150 or $180 Built
256k Kit=$195 $225 Built
384k Kit=$240 $270 Built
512k Kit = $385 $415 Built
One Meg Kit=$465 $495 Built
1.5 Meg Kit=$645 $675 Built
ADD A RAMBO Mod for $45
256/800 PHOENIX Kit=$495 or $525 Built

P-GRAM kit 72k = $150 or $180 Built
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CLOCK for P-GRAM's =$20
KITS Include ALL PARTS Needed

MEMory EXpansion for the GENEVE 9640
MEMEX 504k $245
MEMEX 504k+GENMOD $345
MEMEX 1008k+GENMOD $395
MEMEX 1512k+GENMOD $445
MEMEX 2016k+GENMOD $495
The GENMOD is ADDED to YOUR GENEVE 9640 card.

GENMOD allows the 9640 to address all 2 MEG on the MEMEX card at ZERO wait

Up old 180k to 256k w/instructions=$40
32/16 Console Mem Mod w/Supercart =$40
Ohio Residents add 6% sales tax
Ship OverSeas ADD $7 Surface or $10 AIR
Prices may change if MEMORY costs go up
Shipping FREE Within U.S. and Canada
AmEX + MasterCard + Visa ADD %10
Call 419-385-5946 or Send your order to
Bud Mills Services
166 Dartmouth Dr. Please include
Toledo Oh 43614 your PHONE #

Call TI-COMM BBS on 419 385 7484
for current prices or information
300 Baud,7bit,e / 1200,8,n

Notung Software releases new software catalog

Notung Software recently released its winter catalog of software. Featured in the catalog are:

• **Star Trek the Next Generation Calendar** by Ray Kazmer. The calendar uses digitized pictures. It included 12 full page files that are accessible through Asgard's Pix-Pro, JP Software's McFlix or McCann Software's TPA. The cost is $10.

• **Certificate 99 Companion Plus**, by Ken Gilliland. This disk includes 30 borders, 60 clipart images and 11 fonts. The files work with Certificate 99 by Great Lakes Software. The cost is $7.

• **The Ring Companion**, by Ken Gilliland. This two-disk package features artwork, music and literature about Richard Wagner's *Der Ring des Nibelungen*. The art is in the form of 14 TI-Artist files. The cost is $8.

• **Son of the Disk of Dinosaurs**, by Ken Gilliland. This is a "sequel" to Disk of Dinosaurs and includes 16 realistic graphics of dinosaurs ranging in size from one-eighth to one-third of a screen. Also included on the two-disk set are a background to place the dinosaurs on and an animated cartoon with 60 frames. Requires XBASIC and TI-Artist or similar program. The cost is $12.

• **Filmlib for TI-Base**, by Ken Gilliland. This database for collectors of videotapes. There is room for entering the title, names of up to three actors, the director, producer, score composer, year made, length, whether it is color, colorized or black and white, where located on the tape, and a rating. Requires TI-Base and two disk drives (double-density recommended). The cost is $7 and updates are free.

• **The Baba Brewery Beer Labels**. This consists of 4 black and white bottle labels and 3 5-color bottle labels plus recipes on making your own home brew. Requires XBASIC and TI-Artist—P compatible program. The cost is $7.

• **Fonts and Borders Volume 1**. A companion package for use with TI-Artist. Includes 7 TI-Artist fonts and 15+ border/design instances. The cost is $7.

• **Fonts and Borders Volume 2**, by Ken Gilliland and Ray Kazmer. This package includes 6 large borders, a TI-Artist font called Bricks and an instance alphabet. The cost is $7.

• **Fonts and Borders Volume 3**. Consists of two SSSD disks with new fonts and borders. The cost is $8.

• Also available are several fairware packages for $5 each or 4 for $16. They include:

• **TE2 Encoder**: allows drawing with a joystick and encodes the output for use on electronic bulletin boards with TE2. XBASIC required.

• **The Star Trek Album**: Music and graphics from the first three movies and the original TV series.

• **The South Pacific Soundtrack**: music, graphics and singing from the musical. XBASIC and 32K required.

• **The Patsy Cline Collection**: Music graphics and singing from the country-western star's hits. XBASIC, 32K required.

• **The Music Man Album**: Songs from the musical with animated graphics. XBASIC, 32K and speech synthesizer required.

• **The Wizard of Oz Vocal Scores**: Songs from the stage production with animation. XBASIC, 32K and speech synthesizer required.

• **Richard Wagner's Greatest Hits, Volume One**: Selections of the composer's music with graphics. XBASIC and 32K required.

• **Richard Wagner's Der Ring Des Nibelungen**: Music and art for each part of *Der Ring* (including *Ride of the Valkyries*). Requires XBASIC and 32K.

• **The 1991 KBGB Girlie Calendar**: Realistic, "naughty" beauties. Don't purchase if nudify offends or under 16 years of age. Requires XBASIC and printer for output.

• **9640 Music**: Music and graphics from MDOS by Ken Gilliland. Includes Mozart's *Eine Kleine Nachtmusik*. DSSD.

• **Woodstock, the Maze of Grog and More**: By Ray Kazmer, this disk includes Woodstock's Christmas Present and the Maze of Grog, a Valentine's Day game. XBASIC required.

• **The Infocom Rapid Loader**: Allows users to change the text color and rapidly load Infocom games. By Ray Kazmer. Requires XBASIC.

• **Artcon+**: Saves BASIC and XBASIC screens to TI-Artist and GRAPHX formats, including sprites.

To order or for more information (some disks available only as DSSD or ARChived SSSD) contact Notung Software, 7647 McGroarty St., Tujunga, CA 91042.

John Birdwell dies at 41

John Birdwell died Dec. 27 in Wheaton, Illinois. He was 41. Birdwell died after a lengthy battle with cancer.

Funeral services were held Dec. 31 in Wheaton. Birdwell was employed by Rabbit, a computer company.

He is survived by his wife, Kathy; two daughters, Kelly and Kristen; his parents, Ralph and Helen Jonas; a brother, Michael Birdwell; and a sister, Jan Zajac.

Birdwell was a talented programmer whose best known program for the TI and Geneve is Disk Utilities, a full-featured disk manager/sector editor. Birdwell was also a key figure in updating Myarc's Disk Manager 5 software for the Myarc Hard & Floppy Disk Controller. Birdwell died before completing this project. Prior to his illness, Birdwell was a contributor to MICROpendium, including an ambitious assembly language tutorial that resulted in MICRO-WORD, a word processor. Birdwell was forced to discontinue his work on the series as a result of his illness.

Birdwell was a member of the Chicago TI User's Group. He briefly attended the Chicago TI Faire held Nov. 2, 1990.

The Chicago TI-99/4A Users' Group Presents

THE CTIUG'S E.O.G.

(The Chicago TI-99/4A Users' Group's Encyclopaedia of Graphics for the TI and the 9640 Home Computers)

-VOLUMES #1 & #2-

The CTIUG's E.O.G. is a desk top publishing project which will include a cataloging of ALL of the commercially distributed graphics in the 4A/9640 community. The first volume, which received a "4 star rating" in the December 1990 edition of "MICROpendium Magazine," is a comprehensive compendium of ALL of the commercially distributed fonts which are available in the 4A/9640 community. Its 156 pages depict over 500 discrete fonts, and each is pictured in its entirety. A complete index allows the cross referencing and comparison of all fonts depicted. The pages are printed on single sides in order to facilitate the comparison of the various fonts. Volume #2 is a compendium of ALL of the TIPS ("TI Print Shop") graphics. TIPS is clearly the largest single source of graphics for the 4A and 9640 computers, and Volume #2 provides a handy reference to these graphics and, as does Volume #1, it facilitates the performance of desk top publishing and graphics operations.

The cost of each volume is $10.00 (plus $3.00 for postage & handling). Please add an additional $6.00 for each manual which is to be shipped overseas.

Other CTIUG publications available include the CTIUG's "Hardware Manual" and the "TI Writer Supplement" and companion disk. Both were given a "4 star rating" and "A" evaluations by "MICROpendium Magazine" reviewers. They are available for $6.00 apiece (plus $2.00 for postage & handling). Please add an additional $4.00 for each manual which is to be shipped overseas.

Order both Volume #1 & Volume #2 of the CTIUG's E.O.G. for $23.00 (postage paid), or purchase all 4 publications for the special low price of $35.00 (postage paid).

Membership for one year in the CTIUG is $21.00. This gives you 10 issues of "The Chicago Times," lifetime access to our bbs, access to our extensive library, and free admission to our yearly Chicago International TI Faire.

Send all orders to: CTIUG, P.O. Box 578341, Chicago, IL 60657. For more information, call our "hot-line" at (708)869-4304.

Mission Destruct

More than a simple shoot-em-up

By Stephen S. Bagstad

Mission Destruct is a simple looking, mindless shoot-em-up just like a hundred others, right?

That was my first impression of this game, which has proven to be somewhat addictive despite a few minor problems. The program gets off to a bad start with a plain title screen announcing its title as "Mission Distruct" (sic)! It then launches into the instructions, including "Wepons Fire" (sic). Other misspellings noted include "gravite" for gravity, "comming" for coming, and "enimy" for enemy. Perhaps these were included for added humor?

Anyway, the game is divided into three phases that I will call outer defenses, passage and tunnel. The idea, I think, is that you must penetrate to the inside of a moon to blast its power reactor. So, naturally, you begin by having to defeat the outer defense ships.

Your ship starts in the middle of the screen, while the defenders enter from the top. Your ship can move but not rotate, and you can only fire down. Thus, you must first get to the top of the screen to shoot the bad guys. They manuever in groups, so watching their "follow the leader" pattern you can eventually handle them pretty well — but don't get too cocky!

Once the waves of nine ships each are blasted, you must descend through a moon passage that zig-zags along your screen. No one shoots at you, but contact with the jagged walls or numerous mines (which you can destroy with bombs) is instantly fatal. I felt that with practice this was the easiest of the three sections.

Next comes the real toughie: The tunnel. You must fly down a tunnel with hordes of defenders all intent on crashing into you. Be glad you get four ships at the start — you'll need some of them here!

I found it took practice before I was able to manuever through without losing a ship, but I was able to do that only occasionally. All that you have to do is manuever and blast, but just when you think all is peachy, up comes a final contest. Compared to what you've just been through, this final task is a piece of cake. The reactor that we've been fighting to get to has its own last line of defense, a force field that shoots back! This one is handily defeated by manuevering to avoid its fireballs while shooting to weaken and eventually destroy the reactor.

Provided you make it this far, you get a bonus ship and start again with the other defenses, facing more numerous and faster defenders. With many games played, I've managed to blast a second reactor and proceed to level 3. Suffice it so say that I've yet to see a third reactor.

The graphics, except for the title screen, are excellent. Response is also excellent. I thought it a nice touch that when you get blasted in phases 1 and 3 you don't have to return to the very start of the phase.

Other than the spelling mistakes, I experienced one fairly serious problem with game — it didn't seem to like my joystick fire button, so I had to play with the keyboard of my Geneve, which worked fine. (This problem may have to do more with the Geneve than the game.—Ed.)

It would have been nice to have some method of variable levels of difficulty. I felt a "non-pro" game player might find it a bit too difficult, particularly the tunnel part. But then, we do want to be challenged by our games, don't we?

Finally, what I think was supposed to be entertaining sound effects sounded to me like an irritating buzzing noise that drove me crazy — I finally had to turn the volume off, it was that annoying.

Overall, Mission Destruct is full of variety and challenge at a reasonable price. If you try it on a Geneve, I recommend using GPL speed 1, as the other speeds are too darn fast. I have thoroughly enjoyed it and think you might too.

Review

Report Card

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

Cost: $9.95 plus $2.50 shipping & handling
Manufacturer: Asgard Software, P.O. Box 10306, Rockville, MD 20849; 703-255-3085
Requirements: Extended BASIC, disk system

TICOFF now called Family Computer Expo

It used to be known as TICOFF, but this year the fair in Roselle Park, New Jersey, will be trying to attract a broader audience of computer users. Now called the Family Computer Exposition and Hame Radio Festival, the event is planned for Saturday, March 9, at Roselle Park High School (Exit 137, New Jersey Garden State Parkway). The event is sponsored by students of the high school and the Old Bridge Ham Radio Club.

The event will be open from 9 a.m. to 4 p.m. The admission price is $5 per person. The event will focus on the TI99/4A and PCs. Those who purchase their tickets in advance will receive a disk of PC software. Features include workshops, seminars and vendors.

According to organizer Robert Guellnitz, there will be 70 computer vendors and 60 "Ham Flea Market Tables."

For more information, contact the high school at 201-241-4550 or a 24-hour informational BBS at 201-241-8902.

MICRO-REVIEWS

Page Pro Sideways Picture Printer, Artist Cataloger, TI*mes, Horizon 3000 RAMdisk kit

By HARRY BRASHEAR

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.

You probably remember that just a couple of months ago I was whining about the fact that software was getting scarce, but that's no longer true. Winter is here and the TIer's have come out of summer hibernation. The most amazing thing is that the new season has started with two brand new software companies; MS Express Software and Notung Software. They both get only two stars for their names; the first for originality, and the second for ambiguity. Nevertheless, that will probably be the worse marks they ever receive — these are important and talented people so I'm expecting only the best. I'll give you a quick look at a few of their opening products this round and we'll take a closer look in the months to come.

Notung Software: This company is owned by Ken Gilliland (Disk Of Dinosaurs, Wagner music) and Ray Kasmer, (The Maze of Grog, Woodstock's Christmas Present). What you have here is one the very best possible combinations of programming and graphics the TI community has to offer. They have an illustrated catalog available that will draw money from your wallet like a magnet and leave your tongue hanging out for more. For instance, for Trek fans, a 1991 calendar featuring all your favorite Second Generation characters and mechanicals. There are three volumes of borders and fonts for TI Artist that will just knock your eyes out.

As I said, we'll look at these things closer real soon. In the meantime, send a large SASE for their catalogue to Notung Software, 7647 McGroarty Street, Tujunga, CA 91042

MS Express Software: Micky Schmitt and Michael Sealy have kicked this one off with a few famous friends in tow, including adventure designer Lynn Gardner. Again we are dealing with known quantities that have been dealing out good software for a long time. One of their new entries is Sliding Block Puzzles, a program guaranteed to grab and hold you to the tube for many hours of mental mayhem. They have some unique ideas for software and we'll take a look at them next month. Send for their catalog with a large SASE: MS Express Software, P.O. Box 498, Richmond, Ohio 43944

★★★ PAGEPRO SIDEWAYS PICTURE PRINTER

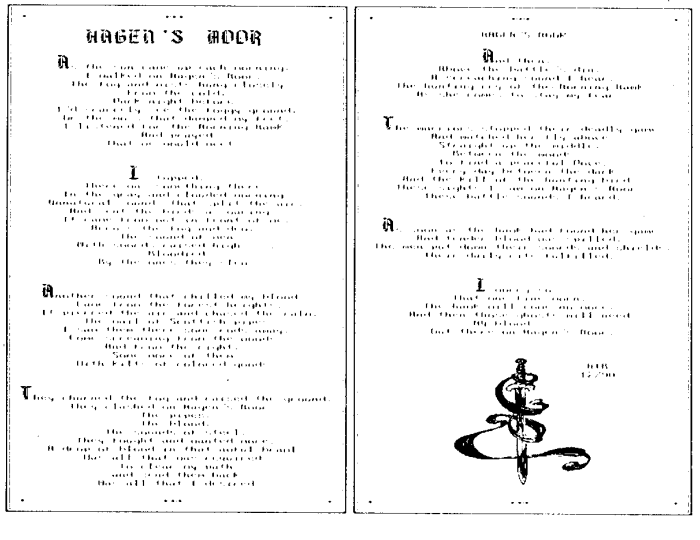
Last month we looked at giant posters that could be made from PagePro pages and pictures. This month, we find we must go in the other direction, toward a reduction in the size of original PP pages. Sideways Printer, like Poster Maker, has a number of specialized and very practical uses.

First of all, take a look at the accompanying illustration. What you are looking at is two pages printed side by side on a single sheet of 8½ x 11-inch fanfold. In this case, it put two pages of badly written poetry in a more practical format for framing, but consider if it was two pages of a newsletter. There is always a push toward a better looking, and possibly, cheaper to produce newsletter; thi one way of doing that.

It should be pointed out though that the aforementioned double page format will not work with full 60-column pages. The example is done with a 48-column template that I keep handy for these purposes. That's not to say that it won't print 60 columns. Actually, if you were to move to 8½ x 14-inch page, you would have no problems. That size makes for a really neat folded newsletter format, by the way.

The program doesn't stop at miniaturization though. You also have double and quad width stretches which have many uses, from certificates to mini-banners, and also double high combinations. Admittedly, there are a number of products that accomplish similar results, but not from the graphic versatility of PagePro.

(See Page 34)



MICRO-REVIEWS—

(Continued from Page 33)

There are a number of templates that come on a second disk with the package, so you get a chance to try a lot of stuff before you take off on your own.

This is a fabulous program that fills a number of needs, but I should advise you, it's decidedly unfriendly. I don't know if this is a result of the language used on it, or rushed programming. The biggest aggravation is that you think you are working with defaulted numbers on the second round of printing, and it's not true; they must be input completely. It's being picky I suppose, but how much more time would it have taken to set up some default lines. It's still a good program and seems crash proof in spite of that.

The cost is $12.95 plus $2.50 per order for shipping and handling. It's from Asgard Software, P.O. Box 10306, Rockville, MD 20849

★★★

ARTIST CATALOGER

It seems to be the time for reinventing the wheel just to add a new spoke or two. We have had Artist font printers before, this one does the same job on fonts. It loads in the whole set, printing it out completely so you can see what characters are available. It does this to as many fonts as you may have on the disk, including the disk name and the font name. Old hat!

Where the program adds a spoke is in the cataloging of instances. Yes, I know, we've had that before, too, but this time you get to put them in rows regardless of size. The ones I have seen in the past only print one to a row. The program reads in as many as will fit on a single row and does them all, no matter how high they may be.

Since we are getting so caught up in monster graphic libraries these days, (and why not) the instance printing part of the program is important because there hasn't been anything like it to date.

The cost of the program is only $10, plus $1 per item S&H. It's from Comprodine, 1949 Evergreen Ave, Fullerton, CA 92635

Before I leave Comprodine, I would like to make mention of something else: They are now distributors for the great products that Great Lakes Software used to create for us. If it hadn't been for bad timing, JoyPaint 99 would have probably beaten out TI Artist. It was a fabulous drawing program and originally cost something like $39.95. Certificate 99 was another item that GLS did a beautiful job on. Anyway, these programs and others are now sold by Comprodine for just $7 each. I can't believe the price! If you don't own these programs, don't wait, catch up to the old timers and put them in your libraries now.

★★★★

TI*MES

No, that wasn't a typo up there, it's the name of the newsletter from the TI99/4A Users Group in England. This is another situation like the one I reported on recently down in Australia — they do it better than we do!

With so many user groups in the U.S. whining and crying about springing for quarters to send out newsletters, a lot of people wonder where they are going to get solid information from. The TI*MES is another easy answer. It's a quarterly newsletter consisting of at least 60 pages, (spring 1990 was 80 pages) in 8½x5¾ format, staple bound and with a stiff cover.

The large majority of the information in this newsletter leans toward the basic system user, people that are making do with just the original P-box equipment and console, even those people who still use the modules and items such as the Mini-Memory Module. In many respects those people get left out in the cold a lot in this country, so you are the ones that will most benefit from a publication like this. If you're looking for cassette tape games and programs, they have them.

Don't let the above comment deter the upper level users from getting this publication. I intended to mention the low-end users first because they need the help and the support more than we "hackers" do. There are enough hardware articles, communications, assembly, and odd items to keep this newsletter on top of the bathroom magazine pile for months. (No insult intended there, but it's all the reading time I get!)

The cost of joining up is $30 surface mail or $36 airmail. If you want to do it right, you should go to a bank and get a sterling money order for 15 pounds or 18 pounds, respectively. Otherwise send greenbacks. They don't want checks or postal money orders.

Money should go to: TI99/4A Users Group (U.K.), c/o Peter Walker Esq, 24 Bacons Drive, Cuffley, Potters Bar, Herts, England, EN5 4DU

★★★★

HORIZON 3000 BOARD KIT

This is not a review. I just couldn't resist saying something nice about the 3000 series Horizon RAMdisks.

I had two 2000 series boards in my P-box and decided that I would very much like to try one of the new ones. Since I had a total of 768K between the two, I wanted to upgrade to at least that much again. Also, I like to build my own stuff.

I ordered up a 3000 kit with seven 128K chips for a new total of 896K.

Let me tell you, these new ones go together slick as yellow water through a tin horn. There's no stacking of chips and a minimum of wire to run so I was up and running in no time. Also, the cut-out switch and 32K now have their own spots on the board.

The best part is the 128K memory chips. By the time I get done, I will have 1.5 megabytes flat on the board; and I can add them over a period of time. Wow!

The new ROS V8.14 allows you to divide a single RAM card into as many drives as you want, as big as you want, up to DSDD. These things just can't be beat.

By the way, if you have a 2000 series board and you want to sell it to someone to get a new one, Bud Mills Services will guarantee the old one for three months to the new owner. Of course, that's only if you buy a new board from him.

Look for Bud's ads in this magazine and go for it.

If you would like me to review your software in this column, please send it to Harry T. Brashear, 2753 Main St., Newfane, NY 14108. If you would like it returned, include a SASE.

User Notes

TEXT__PC for 9640

This comes from Jerry Stern, our Extended BASIC columnist. He writes:

My Extended BASIC program TEXT__PC, published in the January, 1990 MICROpendium, transfers TI-Writer text files from the TI99/4A to a PC without losing the carriage returns or rough formatting. As it was published, it works fine with all 99/4A word processor files, but MY-Word's file format is slightly different, and requires an extra line in the program. Because MY-Word stores a blank line as a line containing nothing, instead of a line containing a line feed, like TI-Writer, blank lines in MY-Word files will crash the TEXT__PC program as published. To convert those blank lines to single carriage returns, add this line:

175 IF A$="" THEN A$="!!"

Don't add this line to TEXT__PC unless you are using the program with the Geneve, because adding the line to the 4A version would just slow down the file transfer process.

TIPS fix for greeting card

This comes from Edward Machonis, of Floral Park, New York. He writes:

If you are having trouble printing the inside of the Greeting Card with TIPS V1.6 or V1.7, the problem may lie with your printer not recognizing the print control codes for horizontal tab used in the program. The print control codes are from the TI printer manual and tab the inside image and messages 40 spaces so they can print on the right hand side of the card. My Epson RX-80 worked fine with V1.4 but had difficulty with versions 1.6 and 1.7.

The author, Ron Wolcott, was gracious enough to call me and point me toward a solution. The print codes are in the linked assembly code of the LOAD program. If you are having problems, make a copy of the disk and do a string search of LOAD with a sector editor, such as Disk Utilities, for Hex string 1B4428009. Replace it with 1B66002800. Write the change back to disk. You will have to do this twice as the code is located in the eighth sector and the 21st sector of the file.

If you are using TIPS V1.7, you will also have to edit line 2520 of TIPSX which contains the print codes for tabbing the 3x4 image. Again using a copy of the program, load the program and BREAK with FCTN 4 at the first prompt. Type in the following line:

```
2520 PRINT #1:CHR$(27);CHR$(
102);CHR$(48);CHR$(40);CHR$(
27);CHR$(76);CHR$(170);CHR$(
1)
```

Save the changed program back to disk with SAVE DSK1.TIPSX. This change is not required in TIPS V1.6 which does not support the 3x4 image. Wolcott has promised a universal tab in V1.8

One line pattern

This comes from Stephen Shaw, of Stockport, England. He writes:

This tiny program requires The Missing Link and produces an interesting pattern.

```
10 FOR X=1 TO 220 :: FOR Y=
1 TO 180 :: T=((X/32)^2)*Y/
32 ::  IF T AND 1 THEN CALL
LINK("PIXEL",X,Y) :: NEXT Y
:: NEXT X :: GOTO 10
```

The final GOTO 10 is just to hold the image on the screen. Instead of AND 1 try AND 2 or AND 4 or AND 8 — we are using the Extended BASIC AND operator not as the usual logic operator but as a binary operator, which works only on numbers up to 32700 odd.

Reminders for NotePad

This is the fourth installment of Bill Gaskill's Reminders system of programs. Refer to September, October and December 1990 issues for previous installments. Reminders requires Brad Snyder's 40-column Utilities. Reminders is used in conjunction with Gaskill's NotePad screen editor (February 1990, MICROpendium.)

This month's Reminders program is actually a revision of NotePad. We are publishing only the lines that need to be replaced. After replacing these lines in the original NotePad program, delete the following lines: 190, 200, 220 and 230 from the new NotePad.

For additional instructions about NotePad, refer to the February 1990 article. To order the 40-column Utilities, send $5 to Brad Snyder, 148 Ave. A, Palmerton, PA 18071.

```
100 ON BREAK NEXT :: CALL LI
NK("SCINIT",1,1,40,19):: CAL
L LINK("CLS"):: CALL LINK("T
EXT",16,5):: GOSUB 920 :: LN
=40 :: CALL LINK("LOWCAS")!2
36
150 CALL KEY(5,K,S):: CALL L
INK("DISP",23,36,STR$(I)):
CALL LINK("ACCEPT",R,1,-LN,"
",A$(I),G):: B$(I)=A$(I):: M
=I !160
160 GOSUB 1080 :: IF G=11 TH
EN 170 ELSE IF G=10 THEN 270
 ELSE 210 !191
170 IF I<=1 THEN 150 ELSE I=
I-1 :: R=R-1 :: G=0 !000
180 IF R=0 AND I>=1 THEN CAL
L LINK("SCROLL",2):: R=R+1 :
: CALL LINK("DISP",1,1,A$(I)
):: RS=I :: RE=I+18 :: GOTO
150 ELSE 150 !216
210 IF R=19 AND I<57 THEN CA
LL LINK("SCROLL"):: R=R-1 ::
 CALL LINK("DISP",19,1,A$(I+
1)):: RS=I-17 :: RE=I+1 :: G
OTO 270 ELSE 270 !133
320 CALL KEY(3,K,S):: GOSUB
1090 :: CALL LINK("DISP",24,
1,"  Printer:PIO"):: CALL LI
NK("ACCEPT",24,11,-20,"",PR$
):: IF PR$="" THEN 150 !109
330 CALL KEY(3,K,S):: GOSUB
1080 :: CALL LINK("DISP",23,
1,"  Report Title:"):: CALL
LINK("ACCEPT",24,1,40,"",RT$
).:: GOSUB 1080 :: GOSUB 1090
 !014
340 CALL LINK("DISP",24,1,"
 Tab spaces from left margin
:20"):: CALL LINK("ACCEPT",2
4,31,-2,"0123456789",T$):: G
OSUB 1080 :: GOSUB 1090 !017
400 CALL KEY(3,K,S):: GOSUB
1090 :: CALL LINK("DISP",24,
1,"  Save:            (Enter=
Exit)"):: CALL LINK("ACCEPT"
,24,8,10,"",P$):: IF P$="" T
HEN 590 !239
470 GOSUB 1080 :: CALL LINK(
"DISP",23,1,"  Existing file
. Overwrite Y/N:"):: CALL LI
NK("ACCEPT",23,32,1,"",YN$)!
049
530 CALL KEY(3,K,S):: GOSUB
```

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User Notes

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```
1090 :: CALL LINK("DISP",24,
1," Load:          (Enter=
Exit)"):: CALL LINK("ACCEPT"
,24,8,10,"",P$,K)!022
540 IF K=10 OR K=11 THEN 730
 !252
900 CALL LINK("DISP",24,1,"
 Are you sure? (Y/N)
          "):: CALL KEY(3,K,
S):: IF K=78 THEN 140 ELSE I
F K<>89 THEN 900 :: RUN "DSK
.NP.NPMENU" !239
970 DISPLAY AT(15,1):"F8
-restore purged file":"=
 -purge current file" :: DIS
PLAY AT(24,1):"Press <ENTER>
 to return.." !228
975 DISPLAY AT(17,1):"1
-display lines  1 - 19":"2
   -display lines 20 - 38":"
3     -display lines 39 - 57
" :: RETURN !071
980 CALL LINK("NORM"):: CALL
 KEY(0,X,Z):: IF X<>13 THEN
980 :: CALL LINK("TEXT",16,5
):: GOTO 150 !073
990 CALL LINK("DISP",24,1,"
 Data Path:
          "):: CALL LINK("AC
CEPT",24,13,15,"",DR$):: IF
DR$="" THEN 990 :: GOTO 150
!200
1240 CALL LINK("DISP",24,1,"
  Enter length of text line:
40          "):: CALL LINK("
ACCEPT",24,29,-2,"0123456789
",LN$):: LN=VAL(LN$):: IF LN
<1 OR LN>40 THEN 1240 ELSE 1
50 !128
```

New address for Ottawa group

The Ottawa TI99/4A Users Group has a new mailing address. Send mail to the group at 3489 Paul Anka Dr., Ottawa, Ontario, K1V 9K6, Canada.

Copying disks with DM-1000

This item appeared in the newsletter of the Cin-Day (Ohio) User Group.

When you use DM-1000 to copy a disk you are offered two choices — bitmap or sector — for the copy mode.

Bitmap — Only the sectors mapped in the disk directory that are used are copied. This means that fractured files will be unfractured on the copy disk and only those sectors are copied. This is the best way as it does not copy unused sectors and so it is a little quicker.

Sector — This choice allows you to clone a disk, (some software companies use renumbered sectors as protection or purposely fracture files), or part of a disk, (blown directory) and, if the defaults are used, it will make an exact duplicate of the disk. If you are not familiar with how the disk is set up, use this default. If you not use the default you could get only part of your programs copied, as it does not use the sector map. For double-density an extended bit map is used. They are not all in sectors 0 to 20 if you have a lot of files on your disk.

You should, if possible, perform what is called "optimizing" on your file disks that you use frequently. As you add or delete programs the files can become fractured (part here and part there) and this can result in slower loading of programs.

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READER TO READER

The Reader to Reader is a column to put TI99/4A and Geneve 9640 users in contact with other users. Be sure to address your questions to Reader to Reader, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

☐ Dan Greenlee, 2435 E. North St., Ste. 341; Greenville, SC 29615; 803-268-2939: Looking for an expansion module for modem connection or a PEB. Will trade or trade plus cash for either.

☐ Stan Krajewski, Route 6 Box 568-15, Live Oak, FL 32060: I have three Shugart half-height DSDD drives. Drives 2 and 3 quit working as I was chaining drive 3 on my system. I might have been shuffling them around while the system was on to check everything as I hooked them up. My question is — does anyone know someone who has the expertise to repair drives for our community reasonably instead of just throwing them away? After all, it might just be one chip or something simple that would be cheaper than buying two new drives.

Also, I have an extensive disk library that I am starting to lose. I have not had any problems like this in the past seven years of owning a TI. It seems since my other drives have gone out that almost every disk I try to make a copy of I find my master disk has a bad sector or sectors. Even my backups that I had in case of this disaster are failing me. Can my only drive left be ruining my disks as it reads it? I have always kept my disks safe and in cases. Any input on either of these problems would be greatly appreciated. (*Before you catalog another disk, put a write-protect label on the disk. If your drive is ruining your disks, this should stop it. The remainder of the problem seems related to your drives and probably the DIP switches. Try going back to your original two-drive configuration and see if it works. Other readers may have additional advice.—Ed.*)

☐ Daniel P. Cochran, 766 N. 13 St., Apt. 4; Reading, PA 19604: I am a TI owner who recently moved from Florida to Pennsylvania. The manual to my TI Impact Printer was lost in the move. If anyone has a copy of the manual that they can spare, I will gladly buy it from them. A photocopy would do just fine.

☐ 4A Video Project, David B. Ross, 2590 Old SR 37 N, Martinsville, IN 46151; 317-342-3249; CIS 71101,167: I have recently begun an effort to bring the dormant external video pin #35 on the 9918a VDP chip to life so that the 99/4A console can be used as an inexpensive on-line video titler and graphics generator.

I have been told that this is not a new idea, but one that has come up many times in discussion. Does anyone know of any results to date? If anyone has knowledge concerning hardware/software applications already in existence, or knows how to get the job done, please contact me.

User Notes

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additional wear on disk drives and, worse, data loss. You can tell when this is happening if you hear the drive head see-sawing back and forth when you load a program.

Optimizing is performed by using the file copy function (Option 1 of DM-1000) to copy your files to another disk. First, copy all files from the original disk to a copy disk. Then use the Sweep Disk function to erase all the files on the original disk. Then copy the files back to the original disk. All the files will be in an unfractured condition.

Hard to find parts for do-it-yourselfers

This item is by Christopher Pratt. It appeared in the PUG Peripheral, the newsletter.of the Pittsburgh TI User Group.

I have found a gold mine of TI treasures for the do-it-yourselfer. All Electronics Corp., aside from an enormous supply of electronics and surplus components, list brand new, original TI items in their catalog. The most common of these TI parts are the 99/4A power supply, transformer and keyboard, which all sell for $3.50 or 10 for $3 each.

More exciting finds include the original MBX Microphone Headset for the Milton Bradley Voice Recognition Expansion System, the original Peripheral Expansion Box push-on/push-off switch, the 3-foot power cord with built-in fuse to plug the transformer into a wall socket, R/F Modulator, battery holders for the 3-volt lithium cells used in the Mini-Memory and Super Cart modules, and heat sinks. Also listed are 5-pin DIN to dual RCA monitor plugs, and 16-pin cable connector for TI parallel ports. Write or call All Electronics Corp. for the catalog (P.O. Box 567, Van Nuys, CA 91408; 800-826-5432).

XB trace to printer

Jim Peterson of Tigercub Software is the originator of this idea, but we picked it up from an article by Ross Mudie in TIsHUG News Digest, New South Wales, Australia. The item has to do with producing non-screen trace output.

At times it would be handy to have the Extended BASIC TRACE function display on a printer rather than on the screen of the computer, especially when TRACE destroys the graphic screen which you are trying to debug. I have tried doing this with assembly language interrupts while the XBASIC program is executing, however, I found that the interrupts come far too infrequently resulting in several program lines executing before the interrupt driven program looked again at the current line number being executed.

The situation is no hopeless, however, there is always another way to approach these problems. Jim Peterson (of Tigercub Software) suggests having a short subprogram which outputs to a printer file, then at the start of each multi-statement program line in the area to be traced call the subprogram with the line number.

Here's an example:

```
150 CALL TRACE(150) :: remainder of the program line
160 CALL TRACE(160) :: remainder of the program line
.
.
.
30000 SUB TRACE(LINE_NUMBER)
30010 PRINT #1:"{";LINE_NUMBER;"}";
30020 SUBEND
```

Somewhere in the program before calling the TRACE subprogram for the first time you will need to open the printer file. For example:

```
120 OPEN #1:"PIO"
```

Of course the subprogram doesn't have to be called TRACE nor does the variable have to be a long name. You could use: CALL T(150), for example. And for the subprogram you could use:SUB T(L).

This technique can be extended to display the value of any variables. Here is an idea to display the variable X. Somewhere in a multi-statement line include the statement — :: CALL V("X",X).

```
30030 SUB V(V_NAME$,VALUE)
30040 PRINT #1:V_NAME$;"=";VALUE;
30050 SUBEND
```

If you want to show the contents of a string variable, use a string variable in place of the numeric variable shown in the example.

MICROpendium pays $10 for items published in User Notes. If you have a tip or idea, routine or other information that may be useful to other readers send it to MICROpendium User Notes, P.O. Box 1343, Round Rock, TX 78680.

```
{ 110 >< 120 >< 130 >< 140 >< 150 >< 160 >< 170 >< 180 >< 190 >< 200 >< 210 >< 220 >< 230 >< 240 >< 250 >< 260 >< 270 >< 280 >< 290 >< 320 >< 340 >< 260 >
```

Here is a sample of the output to expect from such a trace subprogram.

1991 TI FAIRS

FEBRUARY

Fest West 91, Feb. 16-17, Ramada Main Gate, Anaheim, California. Contact Fest West 91 Committee, c/o Bill Nelson, 11692 Puryear Lane, Garden Grove, CA 92640, or call Users Group of Orange County BBS, (714) 751-4332.

MARCH

Family Computer Exposition and Ham Radio Festival, (formerly TICOFF), March 9, Roselle Park High School, 185 West Webster Ave., Roselle Park NJ 07204. Sponsored by students of the high school and the Old Bridge Ham Radio Club. For information write the high school or call (201) 241-4550 or call the 24-hour informational BBS at (201) 241-8902.

APRIL

Northeast TI99/4A Home Computer Fair, April 6. Contact Justin Dowling, The Boston Computer Society, One Center Plaza, Boston, MA 02108.

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

Fest West '91

West Coast event to celebrate tenth anniversary of TI home computer

Fest West '91 is the first TI fair of the new year and will feature seminars, displays and giveaways, including a Horizon RAMdisk and Asgard mouse.1991 also marks the tenth anniversary of the TI home computer.

Thefest is scheduled for Feb. 15-16 in Anaheim, California. The fair will be held at the Ramada Maingate hotel, across the street from Disneyland. The hotel is offering a special fest rate of $55. For reservations, call the hotel at 800-447-4048.

Co-sponsors of the fest are the Users Group of Orange County and the Pomona Valley 99ers. Admission is $6.

Expected to be attending the fair are Ken Gilliland and Ray Razmer of Notung Software; Tom Freeman of T&J Software; Jerry Price of Tex-Comp; Cheryl Whitelaw, MICROpendium's Regena; Barry Traver of Genial Software; Rodger Merritt and Steve Mehr of Comprodine; Bud Mills of Bud Mills Services; John McDevitt of Rave 99; Beery Miller of 9640 News; Jim Horn of Disk Only Software; Bill Gaskill, a frequent contributor to MICROpendium; Bill Chavanne, author of TI-Tax; MS Express; Los Angeles Computer User Group; South West 99ers User Group and Riverside User Group. Asgard products will be available and Asgard owner Chris Bobbitt may attend.

"Most of these experts will be giving a one-hour speech during the two days," says Bill Harms, planning coordinator of Fest West '91.

For more information or tickets write Bill Nelson, 11692 Puryear Lane, Garden Grove, CA 92640; or call Harms at 714-628-1334 in the evening.

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☐ **MY-Word V1.21** $4.00
☐ **Menu 80** (specify floppy or hard disk version(s), **SETCOLOR, SHOWCOLOR, FIND, XUTILS, REMIND** $4.00

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(These disks consist of public domain programs available from bulletin boards. If ordering DSDD specify whether Myarc or CorComp.)

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WANTED

WANTED: The Home Computer Wars book by Michael Tomczyk, and Home Work Helper module, disk and docs by Navarone. Bill Gaskill 303-242-8842 after 6 p.m. Mountain Time. v7n12

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BMC 14-inch color monitor with cable for TI, $100. 384K RAMdisk with 32K memory (32K card not needed), $225. 384K RAMdisk only, $195. Panasonic printer KX-P1091 with cable, $95. DSDD standalone disk drive in case with power supply, $85. SSSD disk drive, $25. Widget, $15. 216-226-5177. C.F. Gilbert, P.O. Box 770607, Lakewood, OH 44107. v7n12

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