

MICROpendium

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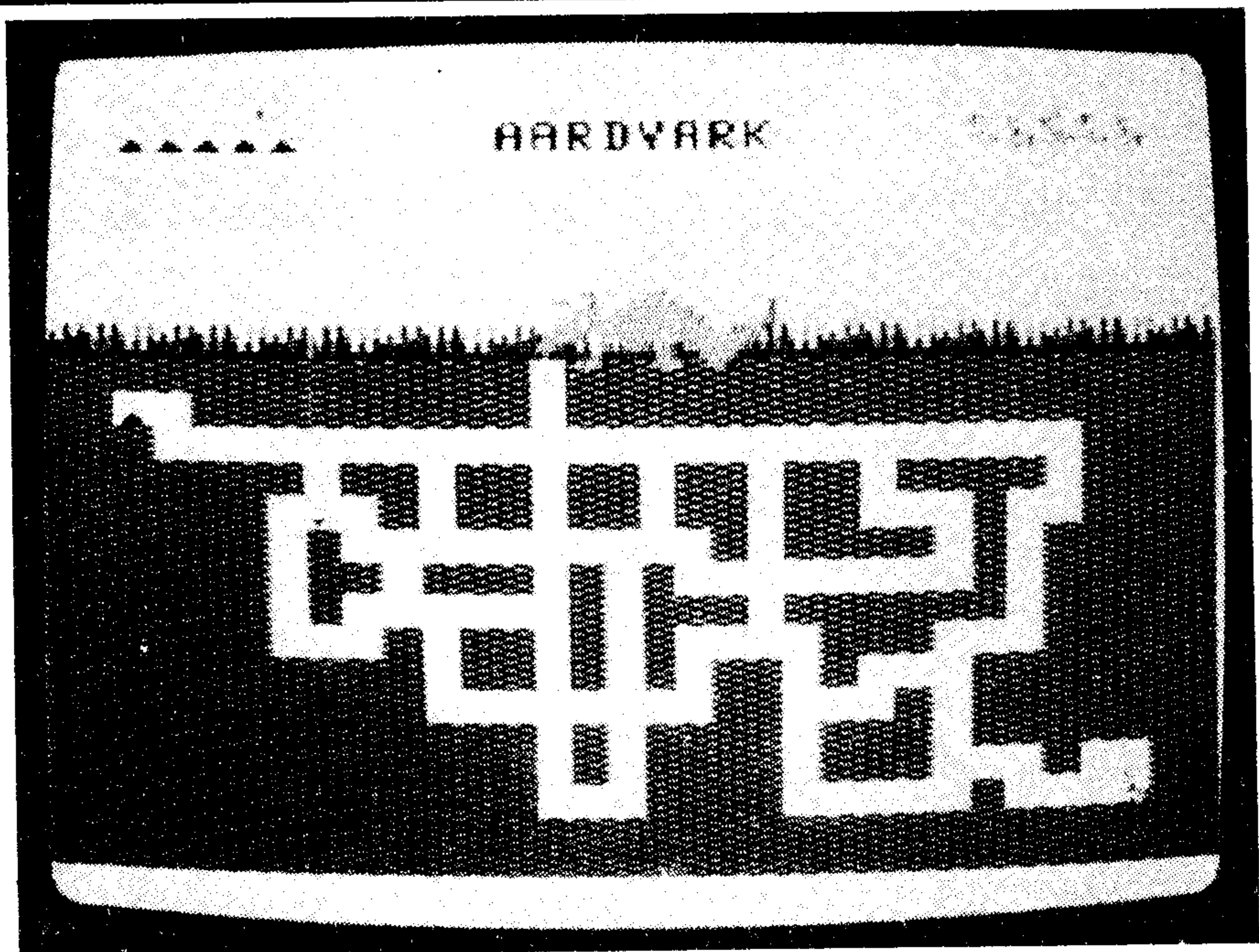
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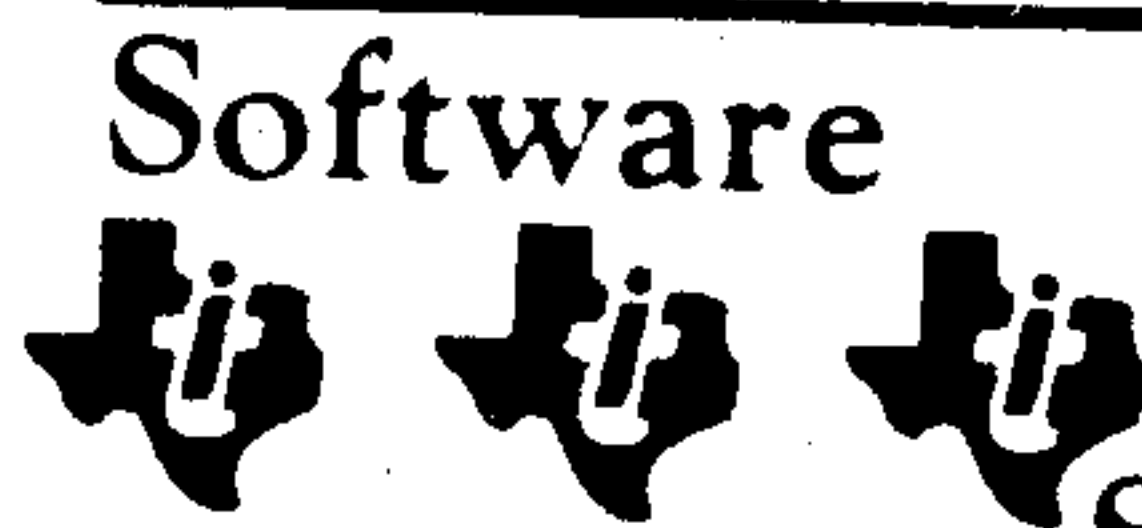
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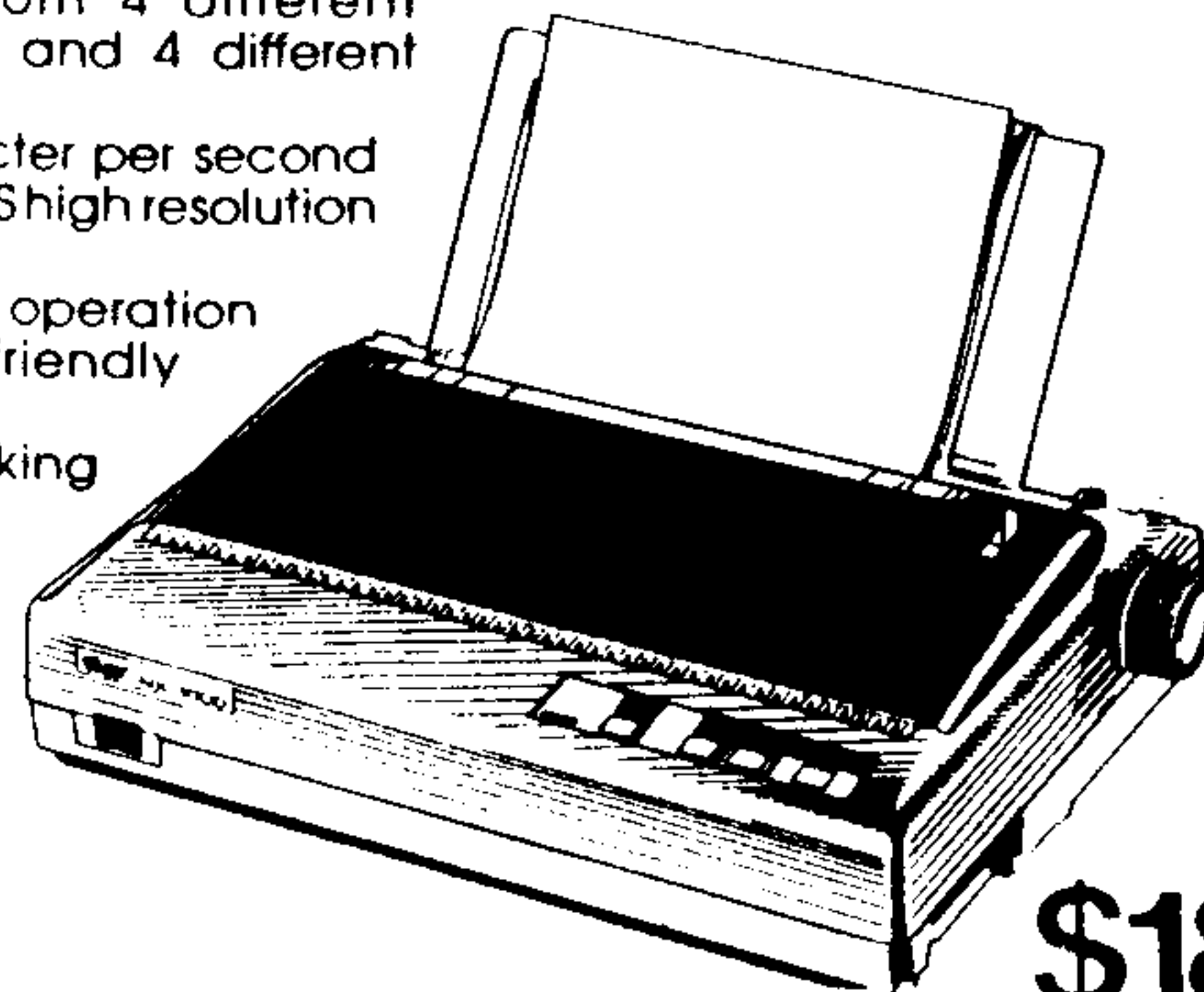
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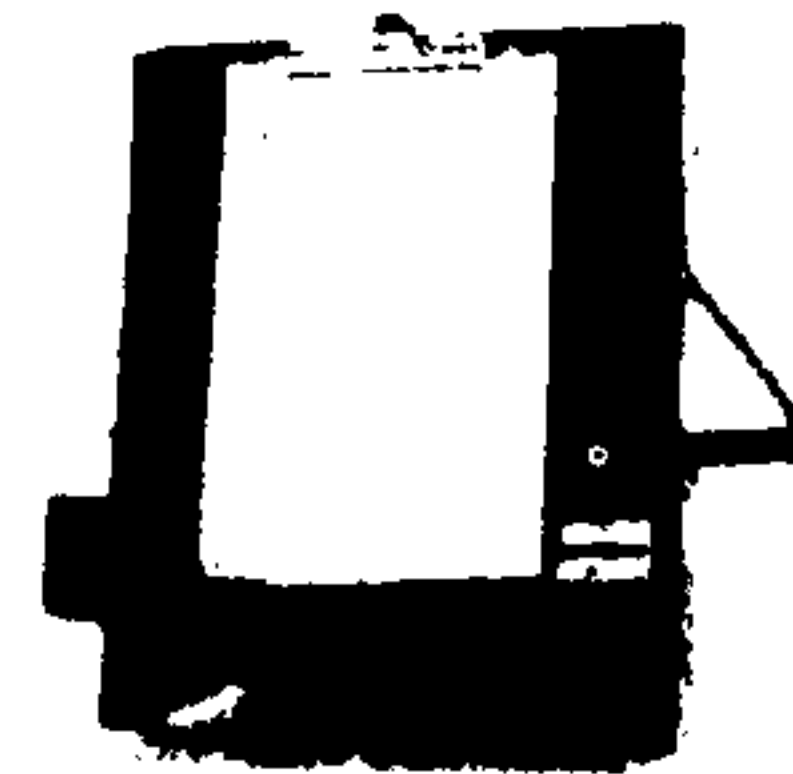
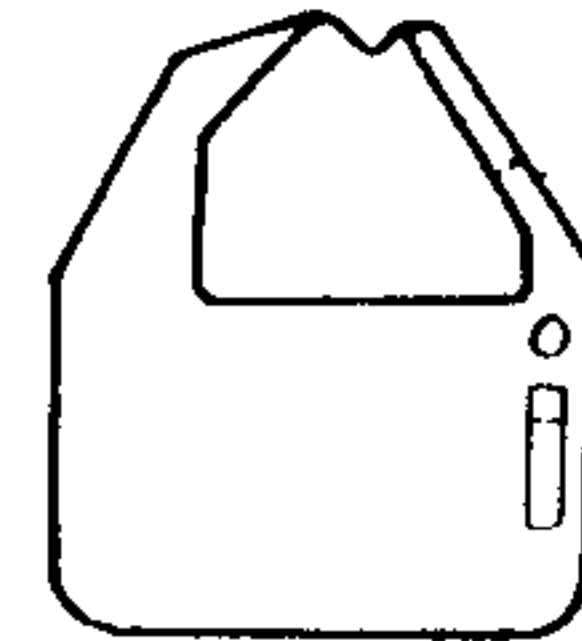


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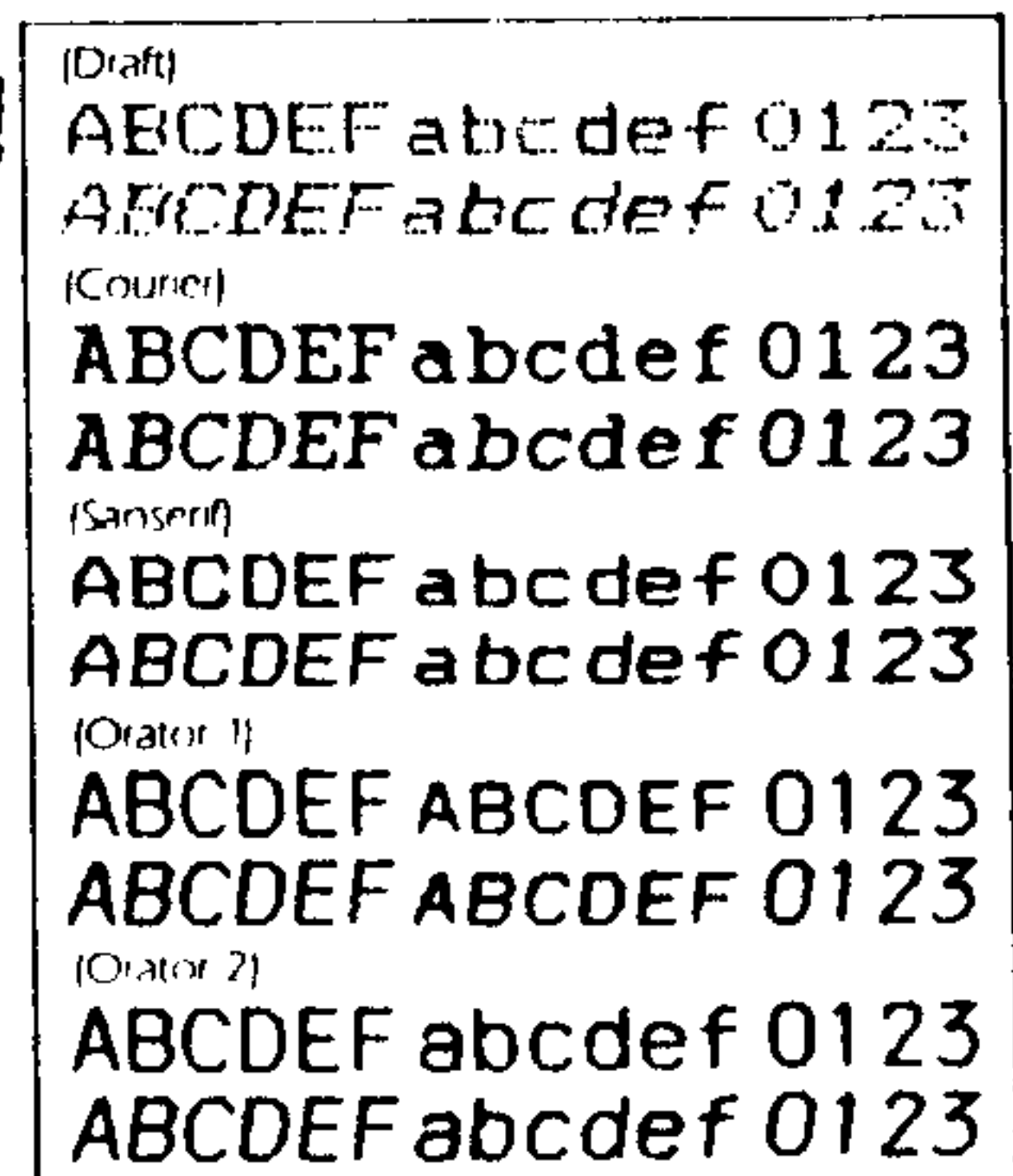
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MICROpendium

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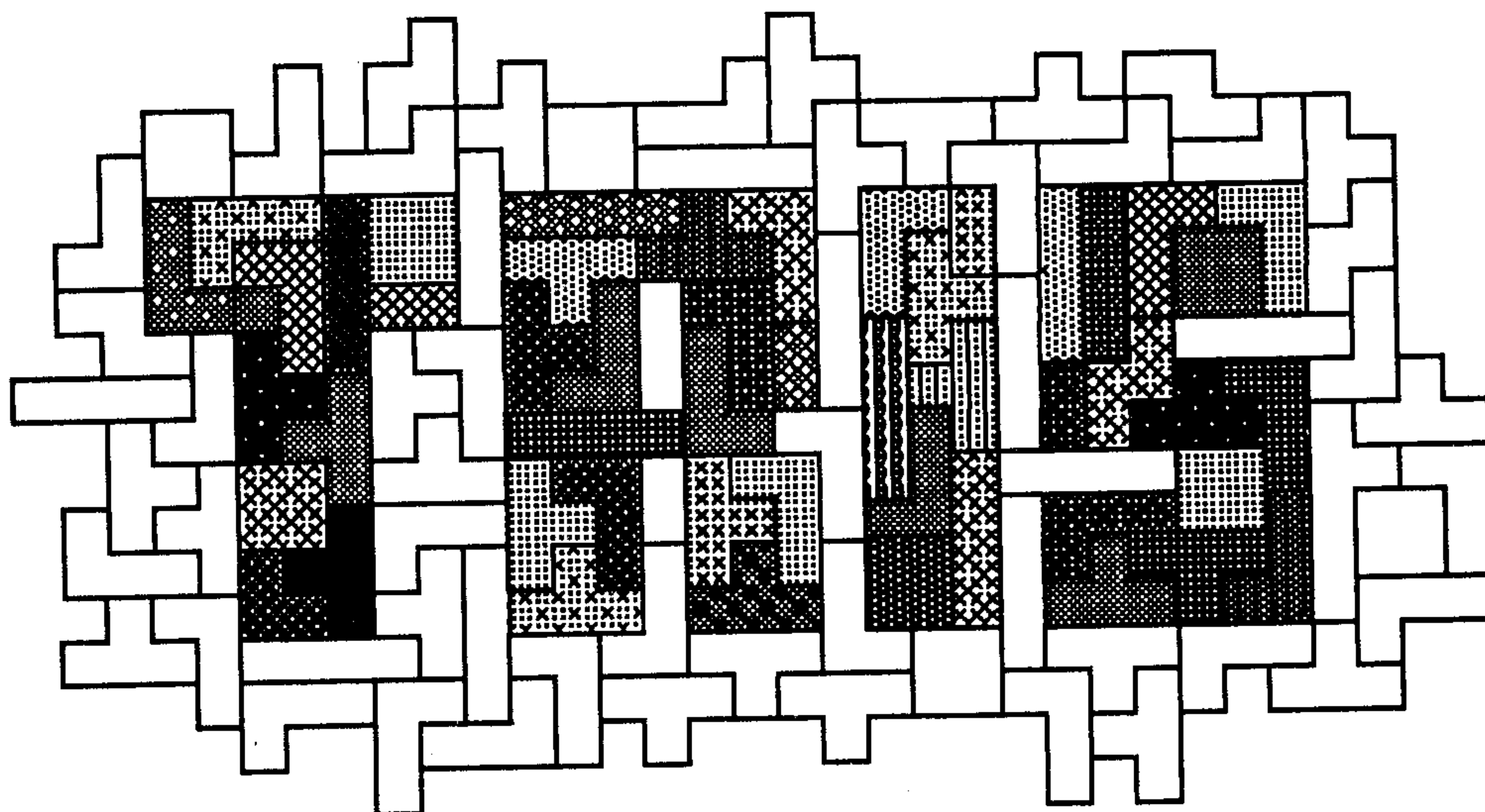
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***READ THIS**

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 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.



An Asgard Software Production

Announcing one of the most addictive games for the TI-99/4A or Myarc Geneve 9640 - Tris! By Jim Reiss & Asgard Software.

Tris is an all-assembly implementation of a remarkable new game from the Soviet Union that has become a hit for every computer from the Commodore 64 and Radio Shack Color Computer to the Apple Mac II and IBM PS/2.

Tris is a game that is easy to play but hard to master. Multi-colored geometric shapes fall from the top of the screen to the bottom. Your job is to rotate and shift the pieces to fill rows at the bottom of the screen. Filled rows disappear automatically, while unfilled rows stack up - the game is over if the unfilled rows hit the top of the screen. The game isn't that simple, though - as you fill more rows the pieces fall faster and faster.

Tris is a true-to-the-original implementation with beautiful color graph-

ics, sound effects, music, and playable action. Tris offers two different key controls, piece preview, scoring, different starting "heights" (to increase the challenge), and more. This well-thought out game was thoroughly playtested for thousands of hours (at least - we lost count after a while), and satisfaction is guaranteed or your money back.

Finally, Tris is available in both a TI-99/4A module version and a disk version that runs through MDOS. In fact, it is the first professional arcade game designed specifically to run under M-DOS (versions 1.06 or higher please).

Please specify either the TI-99/4A or the Geneve 9640 version when ordering.

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Comments

Paying attention to non-hackers

There's nothing like attending a TI fair to generate a little excitement about the future. And Chicago's fair Nov. 4 was no exception. Even though there weren't as many new products introduced (or promised) as in previous years, there was plenty going on to make one look forward to the new year.

One thing I liked to see is the development of more than one windowing environment for the Geneve. Now it is a race between Myarc and its GEME and an unnamed program by Oasis Pensive Abucators, a Canadian company. OPA predicts the debut of its program in early 1990.

Although I hope OPA hits its target, it is just as important that they are developing the program in the first place. GEME has been in development for more than a year and still there's no word about its release date, so the competition can only be of benefit to Geneve users.

USER FRIENDLINESS

Whichever environment reaches the market first, I hope it will be "user-friendly." In other words, that it be something a non-hacker can use. At this point, the Geneve remains a hacker's machine. There is precious little significant, finalized applications software designed specifically for the Geneve. Virtually everything is a rewrite of existing 4A programs. The only really Geneve-specific software being used is stuff that only hackers can understand. The average computer user is left out in the cold because he can't dedicate the kind of time it takes to utilize even the comparatively simple batch file-based menuing systems.

There is an 80-column menuing system on the boards that users who have EXEC, GETKEY and GETSTR can use to load a variety of their programs directly from MDOS. The unfortunate part is that the user has to know how to write, or at least modify, lengthy batch files to use it. Someone with time on his hands can probably figure it out to some extent, but it is definitely not for people who only want to run programs.

Believe it or not, I still get calls from readers who have fully expanded 4A systems and don't know how to load a file into TI-Writer. While this may be an extreme example, there are lots of TI and non-hacker Geneve users who would love to use their computers more but just don't know how to do it. But it isn't all their fault. Just look at the variety of software that exists and how dissimilar in operation it all is. It seems that for every piece of software that has entered the market in the past 3-4 years, users have had to learn an entirely different set of key strokes and commands to use it. When TI was calling the shots, at least everything the company produced looked and worked alike.

From what many readers tell me, simplicity is what they want. They want to be able to learn a program in a reasonable amount of time and not have to carry around 100-page manuals that they have to pore over like monks. As far as I am concerned, software and hardware developers are missing the largest part of their potential market by not making their products easy enough for the non-hacker to use. Jim Horn of DOS talks about people putting their TI's in the closet and how they'd be better served by donating them to schools. I'm talking about users with TI's on their desks with closets full of software they don't know how to use. And I've

got a stack of letters to prove it. C'mon, guys, give us software that we can use without going to night school.

SOME EXAMPLES

Want some examples of well-designed software for the non-hacker? **TELCO**: It has on-line help, status lines and it's crash proof. Use it for a couple of hours and you won't use anything else for telecommunications. **TI-Writer** (and upgrades such as BA-Writer) and **MY-Word**: One is based on the other, but — as long as you don't get too involved with CTRL U printer codes and you use it frequently — they are programs you learn once and never forget. Having the TI-Writer manual, however, is indispensable. **IDENTIFILE**: Mike Dodd makes his programs so simple that even I can run them. The manuals that come with them are short and you really don't need them. And there are others.

(Yes, I realize MICROpendium has a role to place in helping readers learn to use software and hardware. That's why we're running more tutorial-type articles in User Notes and elsewhere. But one can only do so much. But we're trying and will be trying harder from now on.)

A READERS SOFTWARE/HARDWARE POLL

I'm sure readers can come up with more nominations for non-hacker software, and I'd like to hear about them. If you've got a few minutes, send me your nominations for your favorite, non-hacker software. Include a few lines about why each program or hardware item qualifies. Also, and this may be more important, list up to three software or hardware items that qualify as "strictly hacker stuff." Outline the troubles you've had trying to get these items to do what you wanted them to do when you bought them. We'll publish the results in early 1990.

LOOKING AHEAD

Lou Phillips says that Myarc will be mailing the finished version of Advanced BASIC (V3.0) as well as the finished MDOS 1.14G (as it is tentatively numbered) to registered users. Soon. He said Nov. 4 that the company was making copies of the disks and predicted an imminent mailout. To me, that means before Christmas. The hard disk version of MDOS, however, may not be completely debugged and you can forget about the Pascal Runtime for now, or longer.

But Advanced BASIC is a very nice language. It's fast — as long as you don't do a lot of graphics — and it has a bunch of new, powerful commands that should be enjoyed by Geneve users who normally program in Extended BASIC.

And the word on PRESS is that it isn't going to be soon but progress is being made. From what Chris Bobbitt of Asgard Software said about it at the Chicago fair, it will floor a lot of TI users when it comes out. I've got my fingers crossed that 1990 is the year.

1988 DISK ORDERS

We will be filling orders for 1988 MICROpendium disks by December. We are working on reducing the cost from the current \$40 to \$25-\$30. Those who have already placed orders will receive refunds for the difference.

THE GENEVE 9640 HAS LANDED

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

- **Near 100% Compatible:**

- If you have a program written in Basic, Extended Basic, XBII, Assembly Language, Fort, Pascal, you name it, if it runs on the 99/4A then it is near certain to run on the GENEVE.

- **32K No Wait State High Speed RAM:**

- Programs like MultiPlan, which are painfully slow on the 99/4A, run many times faster, thanks in part to the High Speed RAM.

- **V9938 Video Processor with 7 Graphics Modes:**

- Compatible with the 99/4A so you can use the GENEVE with the TV or monitor you are currently using. Same resolution as the Mac but with color. Faster than the Amiga, as fast as the Atari and does it with the aspect ratio, something the Amiga and IBM AT can not do. Aspect ratio renders higher resolution, better color, and appearance through the use of square pixels. In the high resolution mode, 256 colors may be displayed on the screen at one time by the GENEVE, eight times as many as the Amiga can display in its high resolution mode.

- **Mouse Interface:**

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- **6 Complete Pieces Of Software Are Included With The GENEVE. But, three you will not be able to see how you ever did without are:**

- My-Word Processor; 80 columns, help screens for all modes of operation including control-U, initialize a disk without leaving the program, print formatted text to the screen for viewing before sending it to the printer and that's still not all My-Word will do.
- Advanced Basic; the best and most powerful basic on the market today.
- Pascal V4.21; if you have a standard USCD Pascal program, you will be able to run it with this program. If you do not have any Pascal programs, let me tell you, one of the largest library of programs available, is Pascal. Compilers for Fortran, Modula 2, Lisp, and Pilot, as well as business programs from A to Z, are all there. USCD Pascal Software developed for computers from Apple to IBM, will run on the GENEVE, without modification.

GENEVE
9640



By MYARC, Inc.

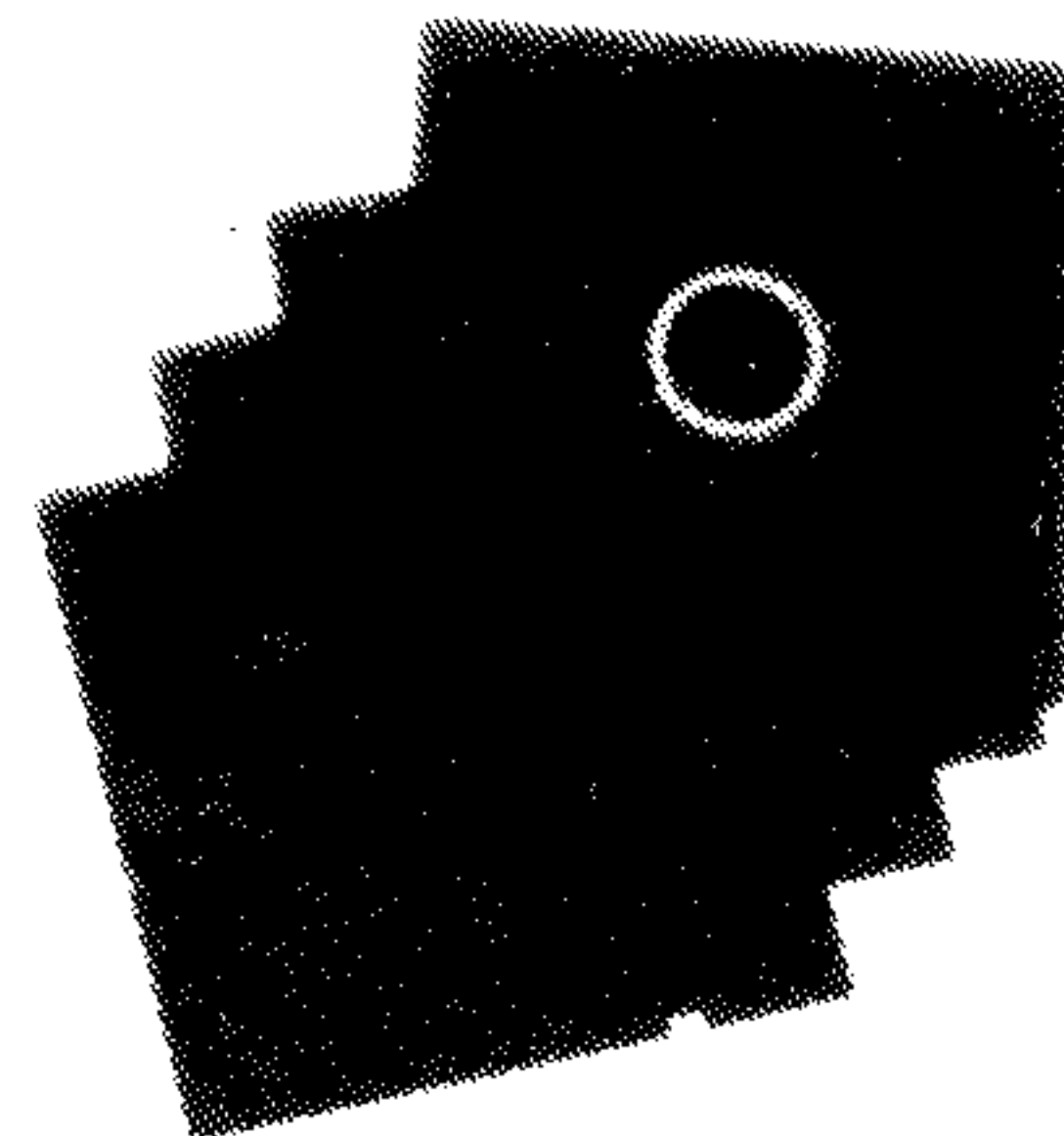
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Feedback

XB moisture problem

In the September MICROpendium, Frank Hreha wrote regarding a problem using Extended BASIC cartridge in the Navarone widget. The XB cartridge is the touchiest cartridge to use in the widget. The widget must be firmly anchored in the GROM port and several methods on how to accomplish this have been reported. In addition, placing the cartridge in slot one of the widget will also enhance its reliability.

Recently another possible source of trouble using the XB cartridge in the widget has appeared. Previously, when problems with the XB cartridge appeared, I would remove the cartridge and clean the edge card connector and the GROM port. Recently when the problems continued I looked at the edge card connector on the widget. There was a line of moisture on the connector and the inner part of the housing around the connector. I cleaned the connector and housing with a cotton swab and reinserted the widget. Thereafter the XB cartridge worked flawlessly.

The line of moisture seems to correspond with the depth to which the widget is inserted in the GROM port. Later when the XB cartridge began to work erratically again, I extracted the widget and the same line of moisture was there. I then inserted blotter paper into the GROM port for several hours. When I extracted the blotter paper, there was a line of absorption identical to the line of moisture appearing on the widget's edge card connector.

I have now begun consistently to replace the widget with blotter paper when the computer is shut down. The moisture continues to appear. While this method does reduce the erratic behavior of the XB cartridge, it does not entirely solve the problem. After all, we purchased the widget to eliminate wear and tear on the GROM port, a purpose defeated by having to insert and remove the widget.

I have checked several widgets and each shows this same moisture line on the edge card connector and surrounding housing. No reasonable explanation for this moisture is apparent. At my home, for example, the computer is located away from the kitchen, bathroom, laundry room and oth-

er sources of water vapor. The house is air conditioned so that the humidity is not a particular problem. Although the moisture appears to be water condensate, I am not sure that it is. On the other hand, neither I nor anyone in my home smokes. Could the moisture be mere condensation? Could it be some sort of exudate from the plastic in the widget or the GROM port?

Mark F. Armstrong
Lexington, Kentucky

This problem is one we have not heard of before. We would be interested in hearing solutions. — Ed.

Sixes and sevens

I want to thank Tom Freeman for confirming that my method of combining Super Extended BASIC and Editor/Assembler for use with the GRAM Kracker not only works, which I already knew, but that it was done correctly. He is renowned for his knowledge of GPL, so I believe his stating, albeit unintentionally, that what I did was correct means it was.

If I sound like I have lost it, to those who read my original article on how I combined SEB and E/A (August 1989 MICROpendium) and then read Tom's rebuttal (September 1989 MICROpendium), which indicated I might have accomplished it but I couldn't have done it the way I said, then please stay with me.

When I dump my SEB module using the GRAM Kracker, I end up with seven files, not six as Tom evidently gets when he saves his SEB module. All dumped SEB modules I have seen consisted of seven files, in fact. Interestingly, I purchased my module from the LA 99ers Computer Group, of which Tom is a member. However, I must assume that there are two versions around, or how else can it be explained that he gets six files and I get seven?

Since I know nothing about the six-file version, I stand by what I wrote originally. (What I wrote is really what I did!) Tom said to add the file which contains the E/A material and I said to substitute it. In essence, we did the same thing. However, since I began with seven files, I had to replace the third file to place the E/A in GRAM 7. He did the same thing by inserting the file and making it the third file in

the series. In the end we both have the same module consisting of seven files.

The big question now for persons wanting to make the described modification is to determine which version of SEB they have. If the dumped SEB consists of six files, then you need to follow his route. If it consists of seven files, then follow my instructions.

Barry Ensley
Grafton, Virginia

More on hardware use in Europe

In answer to Mr. D.H. Caine, in the UK, it's 240 volts, 50 Hz; in France, like in the rest of Europe, we have 220 volts, 50 Hz. In the USA they have 130 volts, 60 Hz.

Don't worry about voltages if you use power supplies for your console and PEB adapted for your local voltage, for the output voltages always stay at +12V, -5V, +5V and 0V DC, which are the only voltages seen by the hardware.

I frequently purchase hardware on the U.S. market because the TI market in France is dead, and I never found any problem with, for example, my CorComp Triple Tech with clock, my CorComp disk controller, my drives bought at Tex-Comp, my two Horizon RAMdisks, etc.

The only things I recommend you not to buy in the USA are printers (60 Hz against 50 Hz and the use of a 240/130V transformer) and monitors (same reasons for RGB monitors and incompatibility between PAL and NTSC colors systems for those with video composite input).

Alain Richard
Le Havre, France

Lawson's in LITI

In regard to "White Shadows Flee" (Feedback, October 1989), Bob Lawson is a member and treasurer of the Long Island TI 99ers User Group. His article appeared in the West Penn 99 newsletter as well as ours.

Frank Bubenik Jr.
Secretary and Newsletter Editor,
LITI 99er User Group
Hicksville, New York

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BASIC

Learning South American geography

By REGENA

A lot of recent news articles indicate people in the United States don't know much about geography.

I have written different programs about sections of the United States to help users learn the locations of the states and learn the capitals. The program this month may help you learn the countries of South America along with their capital cities.

First a map of the South American continent is drawn showing the countries. A country is chosen at random and is printed at the right of the screen.

Use the space bar to move the blinking asterisk from country to country. When the asterisk is

on the country you are asked to find, press the ENTER key. If the country is correct, an arpeggio is sounded and another country is chosen. If the country is incorrect, a low "uh-oh" sound occurs and you will need to find the correct location. The process continues for all 13 countries.

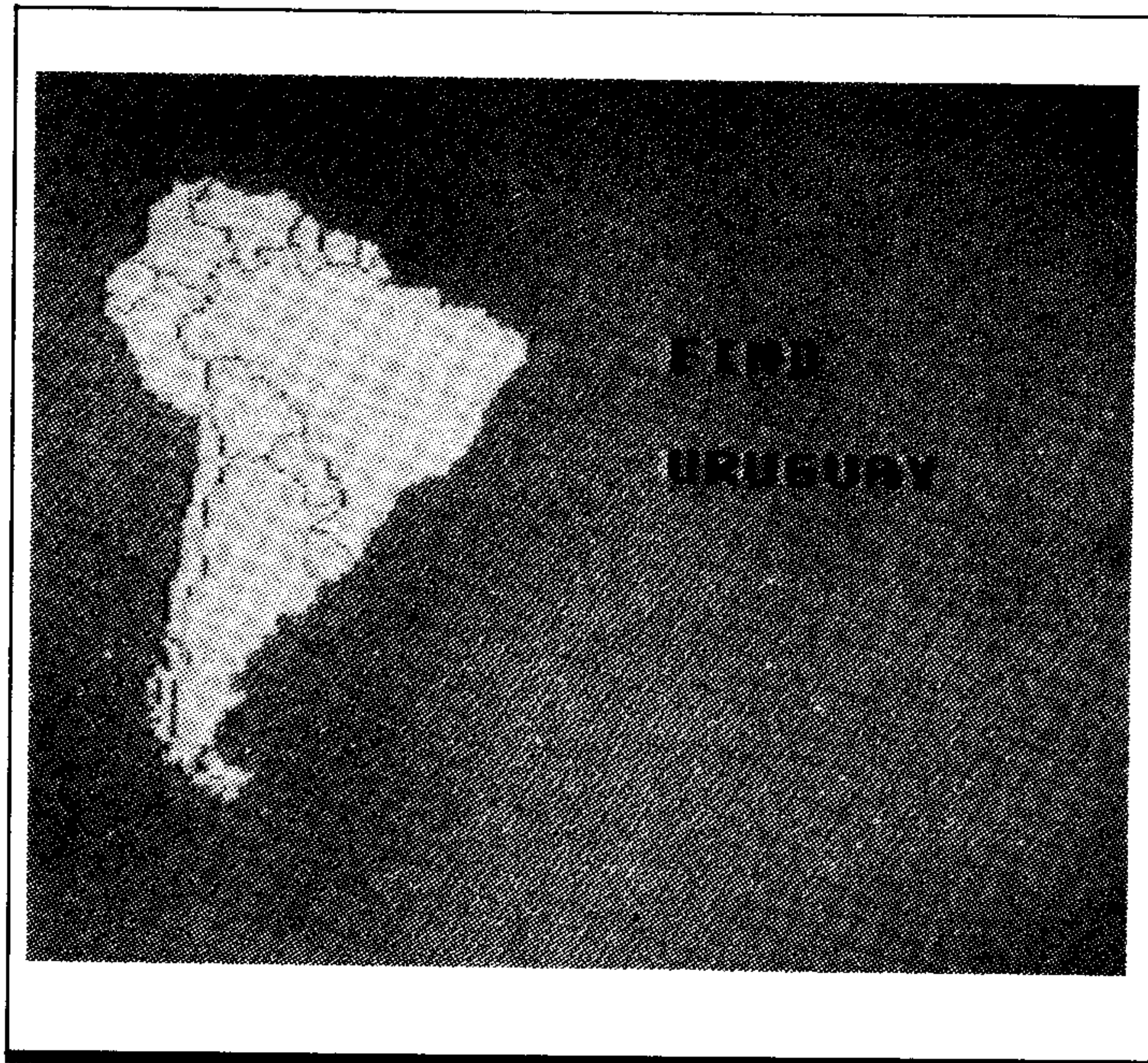
After all 13 countries have been located successfully, there is a matching quiz of countries and capital cities. The capitals are listed on the screen. A country is chosen at random, and you need to press the letter corresponding to the capital city. If you are correct, the computer prints the message "CORRECT!" and that country will not appear again. If you are incorrect, the correct capital is given and that country will appear again. After all 13 countries have been matched with their capital cities, the program continues.

After both quizzes are complete, you may choose whether to go back to the beginning and locate countries, go to the matching quiz or end the program.

Lines 120-130 use OPTION BASE 1 to start subscripts with 1 instead of 0, then DIMENSION variables for the 13 countries. S\$() is the name of the South American country. C\$() is the corresponding capital city. X() and Y() are the row and column coordinates of that country on the screen. P() is used to tell if a country has been chosen previously.

Lines 140-180 print the title screen and instructions. Lines 190-250 read in the DATA for the country, capital, row and column. Lines 260-470 read in the DATA for defining graphics characters for the map. Line 260 says to let J vary from 96 to 158, and Line 270 reads a character definition. Line 280 defines the character number J with the graphic definition A\$.

If you have trouble with this program, the most probable place for typing errors is in the DATA statements (Lines 220-250 and 300-470). Be sure you copy all data items correctly and use commas in the right places. The REM statements indicate which



character number is to be defined with the first item in the next DATA statement. If you get an error message for Line 270 or Line 280, you can PRINT J,A\$ to help locate the problem. J is the character number, and A\$ is the last data item read successfully. If you get an error in Line 280, check A\$. Make sure it uses only numbers and letters up to F (not the letter I or the letter O).

If the program runs okay, but the map looks distorted, the problem could be with one or more of the character definitions in the DATA in Lines 300-470 or in the PRINT statements in Lines 560-730. In general, the characters are in numerical order

from left to right starting at the top row and going down the screen. Several characters are repeated, however, to stay within our 159 definable characters.

Lines 480-500 define the colors for the map. Lines 510-530 wait for you to press the ENTER key before continuing the program. Lines 540-730 clear the screen, change the background to cyan (light blue) and print the map. As you are typing these lines, you will need to use the FCTN key and "C" to print the little mark representing Character 96. Undo the ALPHA LOCK to print the "lowercase" letters, and use the FCTN key for the other symbols found on the fronts of some of the keys.

Line 740 sets A to 1 for the coordinates of the first country. Line 760 indicates the quiz is to be performed for the 13 countries. Lines 770-790 randomly choose one of the countries that has not previously been chosen. Lines 800-830 print "FIND". Lines 840-870 print the name of the randomly chosen country. Line 880 makes a beep sound. Lines 890-930 blink an asterisk on the country while waiting for a key to be pressed. GCHAR is used to determine the graphic character on the screen so after the asterisk is moved the map will be intact.

Line 940 branches if the ENTER key is pressed. Lines 950-990 change the value of A if the space bar is pressed. A may be from 1 to 13 and is used for the X and Y (row and column) coordinates for each of the 13 countries.

If the ENTER key is pressed, Lines 1000-1010 print a red asterisk at the location. Line 1020 checks to see if the location is correct. Lines 1030-1070 are the procedure for an incorrect answer — an "uh-oh" sound then continuing. Lines 1080-1200 are the procedure for a correct answer. Line 1080 erases "FIND", and Lines 1090-1110 print the "CORRECT" message. Lines 1120-1150 sound an arpeggio. Line 1160 sets P(R) equal to 1 so that country cannot

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REGENA ON BASIC—

(Continued from Page 12)

be chosen again. Line 1170 changes the asterisk back to black, Lines 1180-1190 erase the printing and Line 1200 restores the map where the asterisk was. Line 1210 goes to the next country.

When the location quiz is complete, Lines 1220-1290 introduce the matching quiz. Lines 1300-1550 perform the matching quiz for the 13 countries. Lines 1310-1340 clear the screen and randomly choose a country that has not previously been correctly matched. Lines 1350-1370 print the capital cities. Line 1380 prints the randomly chosen country, Line 1390 sounds a beep and Lines 1400-1450 wait for a response, which must be a letter of the alphabet from A to M (or lowercase), and print the letter pressed on the screen.

Line 1460 checks the answer. If the answer is incorrect, Lines 1470-1490 give the correct capital and decrease the value of T so that country can be chosen again. Line 1500 prints "CORRECT!" for the correct response. Line 1510 sets P(R) to 2 so that country will not be chosen again. Lines 1520-1550 wait for the ENTER key to be pressed before the program continues.

After all 13 countries have been correctly matched with their capitals, Lines 1560-1690 offer the option to do the quiz over or end the program.

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

SOUTHAMERICA

```

100 REM SOUTH AMERICA !127
110 REM BY REGENA !071
120 OPTION BASE 1 !137
130 DIM S$(13),C$(13),X(13),
Y(13),P(13)!060
140 CALL CLEAR !209
150 PRINT TAB(4);"** SOUTH A
MERICA **" !029
160 PRINT : : : "FIND THE COU
NTRY NAMED." !194
170 PRINT : "USE THE SPACE BA
R TO MOVE THE CURSOR, THEN
PRESS THE <ENTER> KEY." !1
88
180 PRINT : : "AFTER YOU HAVE
LOCATED THE COUNTRIES, THE
RE WILL BE A QUIZ TO MATCH
THE CAPITALS." : : : : !050
190 FOR J=1 TO 13 !109
200 READ S$(J),C$(J),X(J),Y(
J)!027
210 NEXT J !224
220 DATA COLOMBIA,BOGOTA,4,5
,VENEZUELA,CARACAS,4,7,GUYAN
A,GEORGETOWN,4,8,SURINAME,PA
RAMARIBO,4,9 !044
230 DATA FRENCH GUIANA,CAYEN
NE,4,10,BRAZIL,BRASILIA,8,11
,EQUADOR,QUITO,6,4,PERU,LIMA
,7,5 !098
240 DATA BOLIVIA,SUCRE,9,7,P
ARAGUAY,ASUNCION,10,8,URUGUA
Y,MONTEVIDEO,13,9 !237
250 DATA ARGENTINA,BUENOS AI
RES,14,7,CHILE,SANTIAGO,14,5
!202
260 FOR J=96 TO 158 !231
270 READ A$ !252
280 CALL CHAR(J,A$)!086
290 NEXT J !224
300 DATA FFFFFFFFFFFFFFFF,00
00040F0E1E3E7E,00206CDE9F9FA
FFF,00000000C1FFFF,0000000
0C0C0F0F8 !055
310 DATA 7F7F7F0FF0FEFEFE,F8
F2F7E7EFEFEFE3,0000808098BFB
FBF,0000000000006078,0001030
7083F3F7F !179
320 REM 106 !113
330 DATA FFFFFFFFF3F83BB,FF
FFFFFFE9FBF7F7,787B7B3C8BC7F
FFF,1BFBFBFBFBDFEFF,BFDFDFC
0BF7FFFFFF !056
340 DATA 78706C6C9EFEF8F9,FF
FFF3FBC8B9BE7,BDBEBF7FFFFFF
FFE,FB3BCBE7E7EF8F7F,008080A
0FFFFFFF !148
350 REM 116 !114
360 DATA 7F3F1F0F0F070707,FE
FCFDDFDFEFEF,0080C0C0C0C0C
08,0301010101,08F7F7F7F7F7F
7,17F7F7F7F8FFFFFF !246
370 DATA FFFFFFFFF3FDFEF,FF
FEFEFCF8F0F0E,3F1F0703,FBFBF
BFBF70B1B19,EFF7F7F8FEFEFEFE
,E0C0C0C0C0808 !240
380 REM 128 !117
390 DATA 1D1E1E1E1E1E1F1F,FF
FFFFFFFFOC313F,E0DFBFBFBF7F7
FBF,FF7F7F7F7F07F7F7,1E1E3E3
C3D3D3B37 !008
400 DATA CFF7F9FEFFFFFFE,F7
F1FDFD7C7AFA06,FEFCF0C080808
08,37777777F7F7EFEF,FDFBE7DF
BF877B7D !239
410 REM 138 !118
420 DATA EFEFEFEFF7F7F7F7,7E
7F7F7F7F7FBE9E,E060A080808,0
101030303030303,F7EFDFFBFBFBF
7F7F,0303030307070705 !068
430 REM 144 !115
440 DATA 7F7F7F7F7F7F7F7F,FF
FFFFFFFFCFFFE,E0C0C0C0C,0D0
202020203131B,7F7FBFBFBFBF7F
7F,FEF8F8F0F0F0C08 !077
450 DATA 1E4D6D2D2D0D2D2D,80
8080F0F0E0C,15352D0D3519180B
,FFFFFFFFCFCFCFC7C !063
460 REM 154 !116
470 DATA 01030B0A,80F0E64FC3
074718,0000000000E0FCF8,3F00
0302,906000E08 !129
480 FOR J=9 TO 16 !120
490 CALL COLOR(J,16,1)!049
500 NEXT J !224
510 PRINT "PRESS <ENTER> TO
START." !190
520 CALL KEY(0,K,S)!187
530 IF K<>13 THEN 520 !255
540 CALL CLEAR !209
550 CALL SCREEN(8)!153
560 PRINT " abcd" !051
570 PRINT " `e`fgh" !005
580 PRINT " ijk lmno" !127
590 PRINT " pqr`sd" !152
600 PRINT " tu`v" !23
8
610 PRINT " w`xyz`{" !203
620 PRINT " }`";CHR$(
127)!096
630 PRINT " ";CHR$(128);CH
R$(129);CHR$(130);CHR$(131);
"{" !231
640 PRINT " ";CHR$(132);"
";CHR$(133);CHR$(134);"";CH
R$(135)!228
650 PRINT " ";CHR$(136);"
";CHR$(137);"{" !179
660 PRINT " ";CHR$(138);"

```

(See Page 12)

REGENA ON BASIC—

(Continued from Page 11)

```

"";CHR$(139);CHR$(140)!023
670 PRINT " ";CHR$(141);CHR
$(142);"";CHR$(127)!239
680 PRINT " ";CHR$(143);CHR
$(144);CHR$(145);CHR$(146)!0
19
690 PRINT " ";CHR$(147);CHR
$(148);CHR$(149)!194
700 PRINT " ";CHR$(150);""
;CHR$(151)!050
710 PRINT " ";CHR$(152);CHR
$(153)!090
720 PRINT " ";CHR$(154);CHR
$(155);CHR$(156)!188
730 PRINT " ";CHR$(157);CH
R$(158): : : :!089
740 A=1 !249
750 REM !186
760 FOR T=1 TO 13 !119
770 RANDOMIZE !149
780 R=INT(13*RND)+1 !207
790 IF P(R)=1 THEN 780 !211
800 CALL HCHAR(7,18,70)!007
810 CALL HCHAR(7,19,73)!011
820 CALL HCHAR(7,20,78)!008
830 CALL HCHAR(7,21,68)!008
840 M$=S$(R)!101
850 FOR J=1 TO LEN(M$)!242
860 CALL HCHAR(10,17+J,ASC(S
EG$(M$,J,1)))!180
870 NEXT J !224
880 CALL SOUND(100,1000,2)!1
70
890 CALL GCHAR(X(A),Y(A),G)!
246
900 CALL KEY(0,K,S)!187
910 CALL HCHAR(X(A),Y(A),42)
!224
920 CALL HCHAR(X(A),Y(A),G)!
247
930 IF S<1 THEN 900 !144
940 IF K=13 THEN 1000 !031
950 IF K<>32 THEN 900 !125
960 A=A+1 !251
970 IF A<14 THEN 890 !169
980 A=1 !249
990 GOTO 890 !204
1000 CALL COLOR(2,7,16)!232
1010 CALL HCHAR(X(A),Y(A),42
)!224
1020 IF A=R THEN 1080 !138
1030 CALL SOUND(100,165,2)!1
32
1040 CALL SOUND(100,131,2)!1
25
1050 CALL COLOR(2,2,1)!172
1060 CALL HCHAR(X(A),Y(A),G)
!247
1070 GOTO 900 !214
1080 CALL HCHAR(7,18,32,4)!1
81
1090 FOR J=1 TO 8 !064
1100 CALL HCHAR(17,17+J,ASC(
SEG$( "CORRECT ",J,1)))!075
1110 NEXT J !224
1120 CALL SOUND(100,262,2)!1
30
1130 CALL SOUND(100,330,2)!1
26
1140 CALL SOUND(100,392,2)!1
34
1150 CALL SOUND(200,524,2)!1
32
1160 P(R)=1 !199
1170 CALL COLOR(2,2,1)!172
1180 CALL HCHAR(10,18,32,14)
!018
1190 CALL HCHAR(17,18,32,8)!
235
1200 CALL HCHAR(X(A),Y(A),G)
!247
1210 NEXT T !234
1220 CALL CLEAR !209
1230 CALL SCREEN(4)!149
1240 PRINT TAB(4);"* SOUTH
AMERICA" !166
1250 PRINT : : "MATCH THE COU
NTRY WITH THE CAPITAL CITY.
" !218
1260 PRINT : "PRESS THE CORRE
CT LETTER." : : : :!152
1270 PRINT "PRESS <ENTER> TO
START." !190
1280 CALL KEY(0,K,S)!187
1290 IF K<>13 THEN 1280 !250
1300 FOR T=1 TO 13 !119
1310 CALL CLEAR !209
1320 RANDOMIZE !149
1330 R=INT(13*RND)+1 !207
1340 IF P(R)=2 THEN 1330 !25
2
1350 FOR J=1 TO 13 !109
1360 PRINT TAB(4);CHR$(64+J)
;" ";C$(J)!166
1370 NEXT J !224
1380 PRINT : :S$(R);" ??? " !
152
1390 CALL SOUND(100,1000,2)!
170
1400 CALL KEY(0,K,S)!187
1410 IF (K<65)+(K>109)THEN 1
400 !196
1420 IF (K>77)+(K<97)=-2 THE
N 1400 !023
1430 IF K<96 THEN 1450 !239
1440 K=K-32 !069
1450 CALL HCHAR(23,26,K)!079
1460 IF K-64=R THEN 1500 !04
7
1470 PRINT : "THE CAPITAL IS
";C$(R)!220
1480 T=T-1 !034
1490 GOTO 1520 !068
1500 PRINT : "CORRECT!" !083
1510 P(R)=2 !200
1520 PRINT : : : "PRESS <ENTE
R>";!232
1530 CALL KEY(0,K,S)!187
1540 IF K<>13 THEN 1530 !244
1550 NEXT T !234
1560 CALL CLEAR !209
1570 PRINT "WANT TO TRY AGAI
N?" !080
1580 FOR J=1 TO 13 !109
1590 P(J)=0 !190
1600 NEXT J !224
1610 PRINT : : "CHOOSE:" !207
1620 PRINT : "1 LOCATE COUNT
RIES" !048
1630 PRINT : "2 MATCH CAPITA
LS" !121
1640 PRINT : : "3 END PROGRA
M" : : : :!049
1650 CALL KEY(0,K,S)!187
1660 IF (K<49)+(K>51)THEN 16
50 !140
1670 ON K-48 GOTO 540,1220,1
680 !161
1680 CALL CLEAR !209
1690 END !139

```

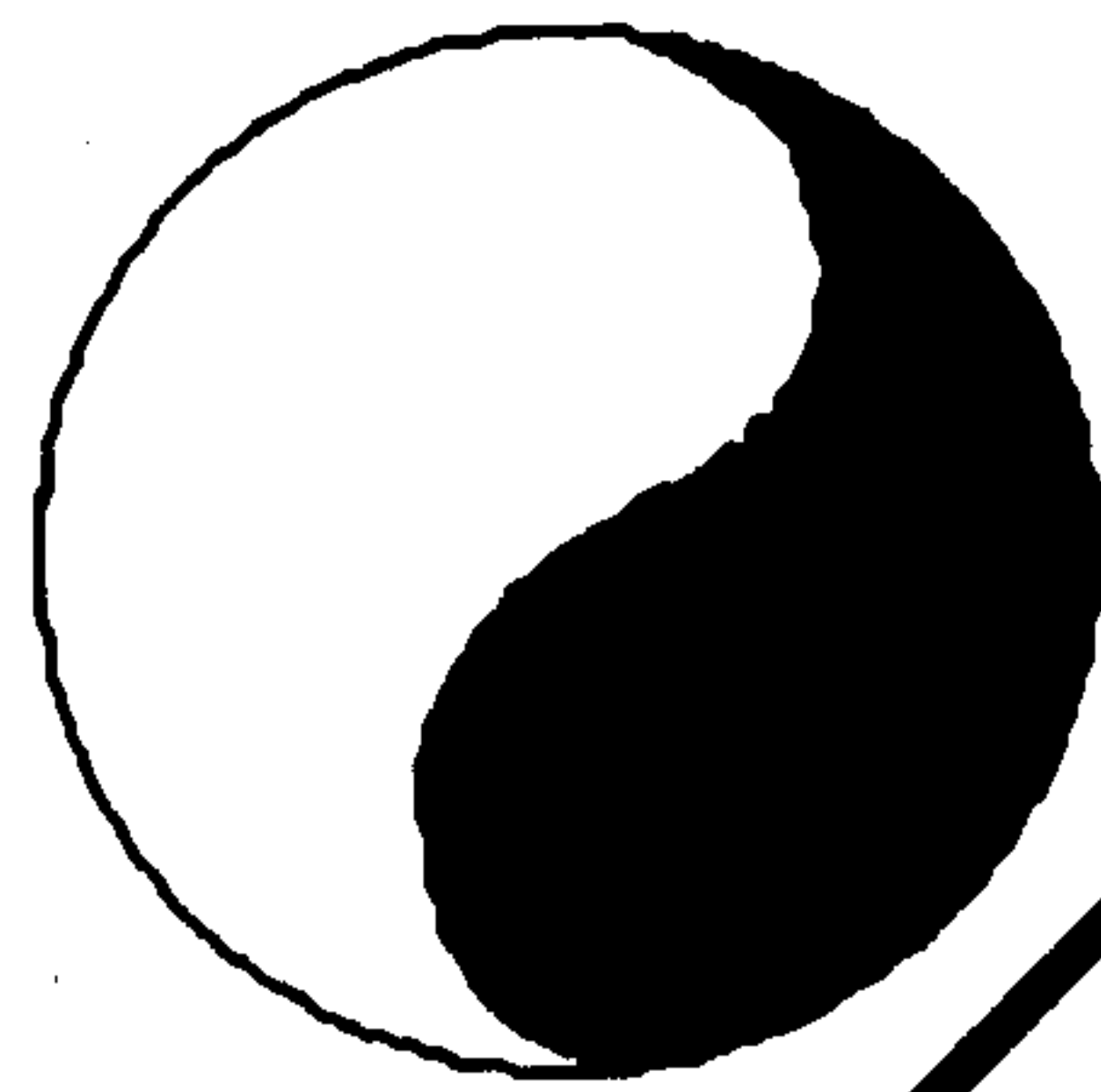
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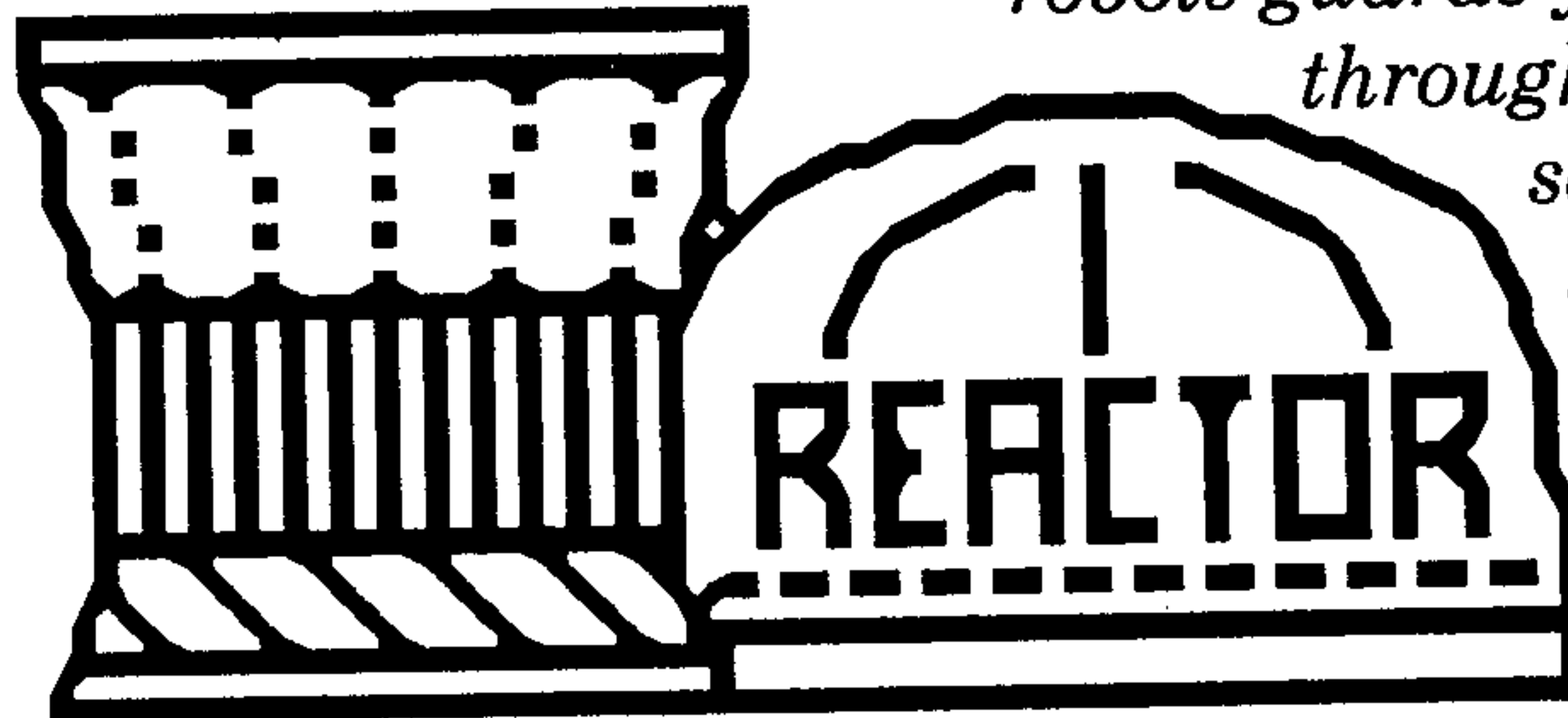
Karate Challenge



Dragons have taken over the minds of the students and teachers at your Karate Dojo. In this fast-paced action-game you must defeat your former friends and masters in order to get a chance to engage the dragons in mortal combat! By Glenn Schworak, Karate Challenge is the fastest and most realistic martial arts game available for the TI-99/4A or Myarc Geneve 9640. The action is fast and furious as punches and kicks fly in your quest to rid your Dojo of the evil dragons. The astounding graphics are both impressive and accurately depict techniques used in karate. No fan of Bruce Lee and Chuck Norris movies should be without this action-packed game!

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EXTENDED BASIC

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By **JERRY STERN**
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Banks get on my nerves. It's bad enough they're charging some ridiculous interest rate to finance my whoozit. It's certainly not that it would be so difficult to admit that the customers deserve some old-fashioned service. And it's certainly not my account that's making them go broke. But on top of all that, I get my year-end mystery statement about this time each fall. It lists the day every payment arrived, when each interest charge was added, the balance at the end of the year, and is generally impossible to make any sense out of.

I gave up on them years ago. Those statements are only understandable to university professors specializing in Egyptian hieroglyphic algebraic bookkeeping. I make my own statements, partly to check the bank, and partly to project what my interest expenses will be for tax deductions.

Yes, I know. There are a LOT of amortization tables available out there. This is slightly different. AMORTIZER prints statements out in 132 columns of compressed print. It needs that much space to print the date, payment number, principal (before payment) and balance (after payment), P.O.P. (Payment On Principal), interest amount and rate, year-to-date interest, loan-to-date interest, total paid on principal (equity), and the total amount paid to date on the loan. Each page holds five years of information; and each year is set off from the others by lines drawn across the printout.

Amortizer understands modern mortgages. If you have that "bought-down" type, where the builder of the house paid the bank to lower your rate, then your interest rate will start low and then increase periodically over the early years of the loan. Some of these have reverse amortization; the principal balance gets larger rather than smaller over those early loan years. Some of these are short-term loans that end with a lump sum payment after maybe five years. AMORTIZER will allow for all of those options.

Even on a conventional loan, AMORTIZER will be useful. For example, tell

AMORTIZER that you will increase your payments by \$50 a month starting next July, and \$100 a month the following July, and see how many years (and how much interest) you'll cut off the loan. And for planning loans, I've included the options to calculate loan sizes for given interest rates and payments, or calculate payments for given rates and loan sizes. The program prompts for all the loan data. Just answer each question as it comes up, and soon you'll be able to spend your time on something other than your mystery statement.

AMORTIZER understands modern mortgages. If you have that 'bought-down' type, where the builder paid the bank to lower your rate, then your interest rate will start low and increase periodically over the early years of the loan. Some of these have reverse amortization AMORTIZER will allow for all of those options.

SOME TIPS ON AMORTIZER

Change the printer default on line 90 to match your printer, but leave the ".CR" in place. AMORTIZER will control the carriage returns separately from the line feeds to divide the printout by year. Some Epson compatible printer codes are used to make the printout clearer. If your printer isn't a TI Impact Printer or compatible with Epson codes, then you'll need to change the print codes in lines 600 and 630.

Most of the program is just straightforward algebra. The formulas for amortization are available in many places. The only tricky part of this program is fitting all those numbers across the page. TI Extended BASIC will set up columns just by us-

ing commas to separate the numbers, but as a number gets larger, like the paid on loan-to-date column, BASIC will add another column to make room, and so throw the columns into disarray. The solution to this mess is the IMAGE statement.

Look at line 740. That IMAGE statement is the format for the printed columns. Type it in very carefully. There should be two blank spaces between each block of characters.

Each of those pound (#) signs reserves space for a single digit. Each group of pound signs is a reservation held for a regular number. The decimal points force the numbers to line up properly. Without those periods, any number ending in zero cents would shift over two places to the right. The slash and apostrophe are just that, they print as those same characters between the month and year in the date column.

This application doesn't need it, but one other character is useful in the IMAGE statement, the circumflex, or $\hat{}$. I think of it as the symbol for "raised to the n-th power." The circumflex must be used four or five at a time, and it indicates scientific notation on the printout. Any number larger than ten digits long will automatically be displayed in scientific notation in this format: #####.^^^ . So $1 + 9,999,999,999 = 1.E+10$. However, $10 \times 1.E99$ will display as $1.E**$.

TI Extended BASIC can handle numbers up to 9.99999 times ten to the 127th power, but it cannot display numbers with exponents above 99 unless an IMAGE string is used to reserve extra space, as #####.^^^ . This will allow $10 \times 1.E99$ to print out as $1.E+100$. There can be no more than ten digits in the format for any number, whether it is in scientific notation or decimal form. That large IMAGE statement is used by line 450.

```
450 PRINT #1,USING 740:M,MOYR,...
```

Notice the comma before USING; that is needed only when printing to a file. Printed to the screen, the statement would lose the number and the comma.

```
450 PRINT USING 740:M,MOYR,...
```

(See Page 15)

EXTENDED BASIC—

(Continued from Page 14)

The IMAGE string does not have to be in an image statement. It can replace the line number in the PRINT USING or DISPLAY USING statements. Line 670 uses this method to print the calculated payment size to the screen. This keeps the payment from being \$327.986128 but instead rounds off the amount automatically to two decimal places, as in \$327.99.

```
670 DISPLAY AT(1,1):USING "PAYMENT SIZE #####.##":IP
```

Notice that the colons after the AT clause and before the variable list are required. This is one of those spots where TI Extended BASIC is as picky about punctuation and exact syntax as my bank is about getting paid on time each month.

Partially, that is what causes problems with any amortization table. AMORTIZER calculates interest based on payments being made on the due date, the same date each month. If you mail in a payment and it arrives two days early, some banks put it into an interest-drawing escrow account, along with money held to pay property taxes and insurance, and then transfer it back as a payment on the due date. Other banks accept the payment and lower the average daily balance appropriately to

Mortgage Payment Book											
PAGE	1										
MONTH	PRINCIPAL	P. D. F.	INTEREST	BALANCE	RATE	PAYMENT	YTD INT	TOTAL INT	TOTAL POP	TOTAL PAID	
1	11/89	5000.00	254.37	40.63	4745.63	9.750	295.00	40.63	40.63	254.37	295.00
2	12/89	4745.63	256.44	38.56	4489.19	9.750	295.00	79.19	79.19	510.81	590.00
3	1/90	4489.19	258.53	36.47	4230.66	9.750	295.00	115.66	115.66	769.34	885.00
4	2/90	4230.66	260.63	34.37	3970.03	9.750	295.00	150.03	150.03	1029.97	1180.00
5	3/90	3970.03	262.74	32.26	3707.29	9.750	295.00	183.29	183.29	1292.71	1475.00
6	4/90	3707.29	264.88	30.12	3442.41	9.750	295.00	215.41	215.41	1557.59	1770.00
7	5/90	3442.41	267.03	27.97	3175.38	9.750	295.00	246.38	246.38	1824.62	2065.00
8	6/90	3175.38	269.20	25.80	2906.18	9.750	295.00	276.18	276.18	2093.82	2360.00
9	7/90	2906.18	271.39	23.61	2634.79	9.750	295.00	304.79	304.79	2365.21	2655.00
10	8/90	2634.79	273.49	21.51	2337.30	10.250	320.00	332.30	332.30	2662.70	2975.00
11	9/90	2337.30	300.04	19.96	2037.26	10.250	320.00	359.26	359.26	2962.74	3295.00
12	10/90	2037.26	302.60	17.40	1734.66	10.250	320.00	385.66	385.66	3265.34	3615.00
13	11/90	1734.66	305.18	14.82	1429.48	10.250	320.00	411.48	411.48	3570.52	3935.00
14	12/90	1429.48	307.79	12.21	1121.69	10.250	320.00	436.69	436.69	3878.31	4255.00
15	1/91	1121.69	310.42	9.58	811.27	10.250	320.00	461.27	461.27	4188.73	4575.00
16	2/91	811.27	313.07	6.93	498.20	10.250	320.00	485.20	485.20	4501.80	4895.00
17	3/91	498.20	315.74	4.26	182.46	10.250	320.00	508.46	508.46	4817.54	5215.00
18	4/91	182.46	182.46	1.56	.00	10.250	184.02	508.46	508.46	5000.00	5399.02

allow for the early payment. The interest charged on the loan will be a few cents lower that month than was originally calculated. If a payment is late, interest for the following month will be slightly higher. On a short term loan, this will make no significant difference, but on a 30-year mortgage, the numbers will drift away from AMORTIZER's precisely calculated advance printout.

The program is only intended for planning purposes, and cannot allow for the changes in interest charged when a payment

is credited late because of a bank holiday, or when a due date falls on a Sunday. Even with automatic transfers to pay your mortgage, those bank holidays and Sundays will gradually throw the numbers off slightly.

Of course, the practical solution to that problem is that when your annual mystery statement arrives, run AMORTIZER again with the new current balance as the starting balance. That should keep you well informed and planned well into the tax season. Or is "tax" a dirty word until after January first?

AMORTIZER

```
90 P$="RS232.DA=8.BA=4800.CR
"!239
100 ! AMORTIZER :JLS 1989 V.
2.0 !242
110 DEF DC(X)=INT(X*100+.5)/
100 !084
120 ON WARNING NEXT :: CALL
BLUE !234
130 A$="AMORTIZER
CALCULATE PAYMENT SIZE CA
LCULATE SIZE OF LOAN QUIT" :
: XYR=0 :: PO=100000 :: BP=10
00 :: XMO=1 :: IP=100 :: RA=
.1 :: CF=12 !207
140 OPEN #1:P$,VARIABLE 132
:: C$=CHR$(10)&CHR$(13)!004
150 CALL CLEAR !209
160 DISPLAY AT(1,4):"MORTGAG
E PAYMENT BOOK" :: CALL CHAR
(95,"00FF"):: CALL HCHAR(2,6
,95,21)!104
170 DISPLAY AT(3,10):"AMORTI
ZER" !027
```

```
180 CALL MENU(A$,X)!123
190 ON X GOTO 200,640,690,75
0 !164
200 REM AMORTIZER !119
210 YXI,TP,M,TXI=0 !176
220 GOSUB 490 !059
230 GOSUB 540 :: GOSUB 550 !
104
240 GOSUB 500 !069
250 IF P<=RA*PRN/12 THEN DIS
PLAY AT(16,6):"NO AMORTIZATI
ON!" :: CALL SOUND(200,-3,0)
!129
260 GOSUB 520 !090
270 GOSUB 560 !130
280 DISPLAY AT(24,1):"CHANGE
NUMBERS OR PRINT? C/P" :: A
CCEPT AT(24,28)SIZE(-1)VALID
ATE("CP")BEEP:Y$ !122
290 IF Y$="C" THEN 220 !031
300 IF P<=RA*PRN/12 AND BP=C
F THEN 250 ELSE GOSUB 600 !1
86
```

```
310 IF BAKP THEN 430 !062
320 XI=DC(RA*PRN/12):: POP=P
-E-XI :: M=M+1 :: BA=PRN-POP
:: TXI=TXI+XI :: TP=TP+POP
:: YXI=YXI+XI !198
330 PRINT #1,USING 740:M,MO,
YR,PRN,POP,XI,BA,RA*100,P,YX
I,TXI,TP,TP+TXI :: MO=MO+1 !
180
340 IF MO=13 THEN MO=1 :: YR
=YR+1 :: YXI=0 :: IF YR=100
THEN YR=0 !113
350 IF MO=1 AND M>1 THEN PRI
NT #1:CHR$(13);RPT$("_",132)
!064
360 PRINT #1:C$ !175
370 PRN=BA !049
380 IF M<>CF THEN '420 !247
390 CALL CLEAR :: DISPLAY AT
(3,6):"AFTER PAYMENT #:";M :
: GOSUB 540 :: GOSUB 550 ::
GOSUB 560 !168
```

(See Page 16)

EXTENDED BASIC—

(Continued from Page 15)

```

400 IF P>RA*PRN/12 THEN 420
!233
410 DISPLAY AT(21,1):"NO AMO
RTIZATION!" :: GOTO 390 !060
420 IF M=INT(M/60)*60 THEN P
RINT #1:CHR$(12):: GOSUB 600
!147
430 IF BA>P AND BP>M+1 THEN
320 !230
440 XI=DC(RA*PRN/12):: P=BA+
XI :: POP=P-XI :: M=M+1 :: B
A=PRN-POP :: TXI=TXI+XI :: T
P=TP+POP :: YXI=YXI+XI !052
450 PRINT #1,USING 740:M,MO,
YR,PRN,POP,XI,BA,RA*100,P,YX
I,TXI,TP,TP+TXI :: PRINT #1:
C$ !178
460 PRINT #1:CHR$(18)!190
470 CALL PAUSE :: GOTO 150 !
079
480 REM SUBROUTINES !029
490 DISPLAY AT(3,1):"Princip
al?";PO :: ACCEPT AT(3,12)VA
LIDATE(NUMERIC)SIZE(-11)BEEP

```

```

:PO :: IF PO<=0 THEN 490 ELS
E PRN,BA=PO :: RETURN !041
500 DISPLAY AT(11,1):"1st Pa
yment due month #";XMO :: AC
CEPT AT(11,25)SIZE(-2)VALIDA
TE(DIGIT)BEEP:XMO :: IF XMO<
13 AND XMO>0 THEN MO=INT(XMO
)ELSE 500 !107
510 DISPLAY AT(12,1):"1st Pa
yment due year #";XYR :: AC
CEPT AT(12,25)SIZE(-2)VALIDA
TE(DIGIT)BEEP:XYR :: YR=INT(
XYR):: RETURN !188
520 DISPLAY AT(14,1):"Balloo
n Payment? (Y/N) N" :: ACCEP
T AT(14,24)SIZE(-1)VALIDATE(
"YN")BEEP:Y$ :: IF Y$="N" TH
EN BP=1E9 :: RETURN !167
530 DISPLAY AT(15,1):"Balloo
n Due at month #";BP :: ACCE
PT AT(15,24)VALIDATE(DIGIT)S
IZE(-4)BEEP:BP :: RETURN !11
9
540 DISPLAY AT(5,1):"Interes
t rate %? ";RA*100 :: ACCEPT

```

```

AT(5,19)VALIDATE(NUMERIC)SI
ZE(-6)BEEP:RA :: IF RA<0 OR
RA>=100 THEN 540 ELSE RA=RA/
100 :: RETURN !003
550 DISPLAY AT(7,1):"Payment
size?";IP :: ACCEPT AT(7,15
)VALIDATE(NUMERIC)SIZE(-11)B
EEP:IP :: IF IP<=0 THEN 550
ELSE P=IP :: RETURN !157
560 DISPLAY AT(17,1):"Will t
he rate or payment change
? (Y/N) N" :: ACCEPT AT(18,1
5)VALIDATE("YN")SIZE(-1)BEEP
:Y$ !235
570 IF Y$="N" THEN CF=999 EL
SE DISPLAY AT(19,1):"At whic
h payment #?";CF :: ACCEPT A
T(19,21)VALIDATE(DIGIT)SIZE(
-3)BEEP:CF !036
580 RETURN !136
590 DISPLAY AT(21,1):"Number
of Payments?";N :: ACCEPT A
T(21,21)VALIDATE(DIGIT)SIZE(
-4)BEEP:N :: IF N=0 THEN 590
(See Page 17)

```

Mailing List Manager

For TI Base

Keeping track of names, addresses, and telephone numbers can be a real bore. Most people use address books for this... and most people know all about the horrors associated with them. They're never around when you need them, always a mess, and difficult to maintain. Enter Mailing List Manager.

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Mailing List Manager is written in TI Base for TI Base; all of the command files included with MLM can be viewed using the TI Base editor and altered to suit your own needs.

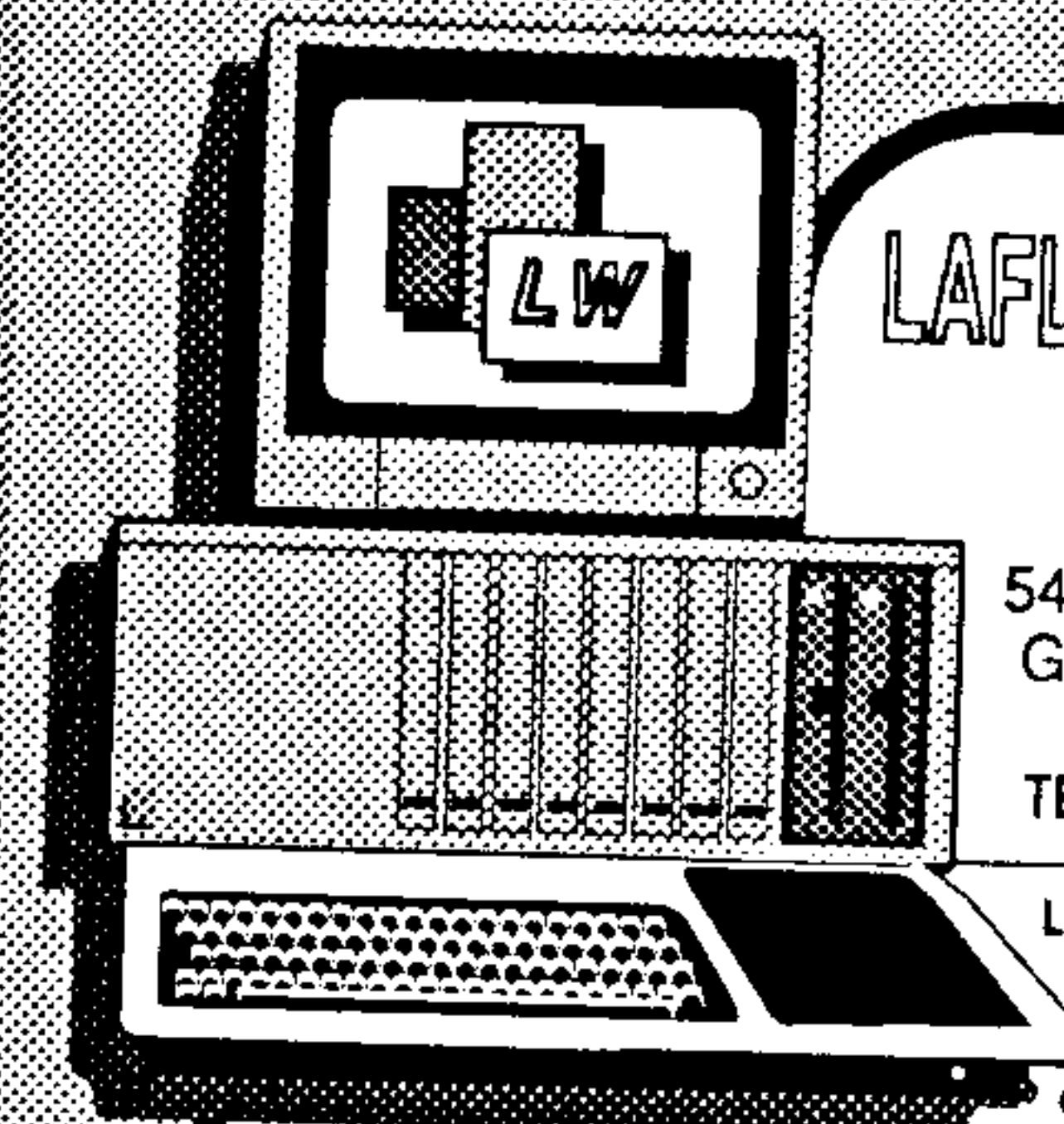
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EXTENDED BASIC—

(Continued from Page 16)

```

ELSE RETURN !065
600 PRINT #1:CHR$(18);TAB(20);CHR$(14);"Mortgage Payment Book";CHR$(20);CHR$(13)!228
610 PRINT #1:"PAGE ";INT(M/60)+1;CHR$(15);C$ !127
620 PRINT #1:"  MONTH
PRINCIPAL      P.O.P.      INT
EREST          BALANCE     RATE
PAYMENT        YTD INT     TOTA
L INT          TOTAL POP    TOTAL P
AID";CHR$(13)!212
630 PRINT #1:CHR$(18);CHR$(14);RPT$(" ",40):: PRINT #1:C$;CHR$(20);CHR$(15):: RETURN !115
640 REM OPTION 2 !229
650 GOSUB 490 :: GOSUB 540 :
: GOSUB 590 !077
660 R=RA/12 :: IP=DC(PO*R/(1-(1+R)^-N))!081
670 DISPLAY AT(1,1):USING "PAYMENT SIZE #####.##":IP :: CALL HCHAR(2,1,95,32)!203
680 CALL PAUSE :: GOTO 150 !079
690 REM OPTION 3 !230
700 GOSUB 540 :: GOSUB 550 :
: GOSUB 590 !138
710 R=RA/12 :: PO=DC(IP*(1-(1+R)^-N)/R)!081
720 DISPLAY AT(1,1):USING "PRINCIPAL #####.##":PO :: CALL HCHAR(2,1,95,32)!090
730 CALL PAUSE :: GOTO 150 !079
740 IMAGE ### #'## #####
###.## #####.## #####.##
## #####.## ##.### ###
#####.## #####.## #####.##
## #####.## #####.##
!203

```

```

750 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
30595 SUB MENU(A$,X)!127
30600 ! A$ IS LIST OF OPTION S, EACH 23 CHARACTERS LONG !083
30605 ! X : RETURN VARIABLE FOR NUMBER OF CHOICE !043
30610 FOR L=1 TO LEN(A$)/23+.9 !205
30615 DISPLAY AT(4+L,1):L;SEG$(A$, (L-1)*23+1,23)!204
30620 NEXT L !226
30625 IF SEG$(A$,70,4)="QUIT" THEN L=L-1 :: GOTO 30635 !067
30630 DISPLAY AT(4+L,1):L;"MAIN MENU" !181
30635 DISPLAY AT(23,3):"CHOICE?" !074
30640 CALL SOUND(200,-1,4)!220
30645 CALL KEY(0,X,S):: IF S<1 OR X>L+48 OR X<49 THEN 30645 ELSE X=X-48 !131
30650 DISPLAY AT(2,3)ERASE ALL:SEG$(A$, (X-1)*23+1,23)!166
30655 SUBEND !168
30820 SUB PAUSE !236
30825 FOR D=1 TO 100 :: NEXT D !241
30830 DISPLAY AT(24,1):"PRESS ANY KEY TO CONTINUE" !120
30835 CALL KEY(0,K,S):: IF S<1 THEN 30835 !049
30840 SUBEND !168

```

Sports Pics

Sports Pics, by Paul E. Scheidemantle, contains almost 60 all-original drawings covering almost every major sport. These highly detailed, well-documented pictures are a must for anyone who enjoys sports. If you are involved in local teams, enjoy a particular sport as a hobby, or just simply like action shots of people engaging in various sports gracing your pictures and pages, you'll find *Sport Pics* useful and worthwhile.

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FORTH

High resolution graphics in Forth

By LUTZ WINKLER

For those with 9938 equipped machines (Dijit Systems AVPC, Geneve and Mechatronics 80-column card) access to the high-resolution graphic modes in Forth is relatively easy if the data manual for the 9938 is available. Since obtaining a copy seems next to impossible at the moment and I am one of the fortunate few who have this invaluable aid, I was able to implement the routines not only for the 80-column text mode TEXT 2 (see August, 1989 MICROpendium) but for the Graphic 6 and 7 modes as well. These modes use up to 512 pixels/212 lines (16 colors) or 256/212 (256 colors), respectively. Screen 123 shows the two words to set the display to either of these modes.

While the 9938 is capable of displaying two "pages" in these modes, my Forth words utilize only page 1, leaving the VDP RAM of page 0 undisturbed because much of Forth's utilities use the lower VDP RAM. In order to make some of the "primitives" shown on the following screens to be "mode smart," VDPMD E is set to 16 (>10) for G6 and 17 (>11) for G7.

I have not commented the G6 and G7 words as I did the TEXT 2 word. This is partially because I used a different approach and also because — operating in the high region of VDP RAM — there is not nearly as much to do. Thus, registers 0 through 23 are set with a loop. If you inspect the words closely you'll find that only the parameter for register 0 differs. The reason for going all the way up to 23 is that — as shall be seen later — other registers may be set for various reasons and they should be cleared when the mode is changed.

Neither the G6 nor the G7 word clear the screen when invoked. This is intentional and will be explained later. The conditional load on line 2 of screen 123 ensures that the "primitives" shown on screens 124 through 126 are booted (or already in memory) before G6 and G7 are loaded. Line 2 of screen 124 sets up a boundary so that all graphics routines can be dropped from memory with a simple FORGET GR. A number of CONSTANTS and words are then set up for dot, screen and text colors very much like the procedure used by TI's graphic routines. CLIP_PIXEL assures that dots which would fall outside the screen boundaries are dropped and will not be displayed.

(See Page 19)

```

SCR #123
0 ( GRAPHIC MODES 6 AND 7                                28SEP88 LW )
1
2 BASE->R DECIMAL 124 CLOAD STAT? 0 CLOAD G7
3 HEX
4 : G6 ( set Graphic 6 mode ) 4 SCOL 00 0E VWTR
5   00 00 00 00 00 00 00 00 00 00 00 00 00 00 \ VR 23 - 10
6   80 0A 00 00 00 00 00 00 3F 40 0A \ VR 9 - 0
7   18 0 DO 1 VWTR LOOP \ set Vregs 0 - 23
8   40 83D4 C! 10 VDPMD E ! ; \ copy VR 1, store VPD mode
9 : G7 ( set Graphic 7 mode ) 3 SCOL 00 0E VWTR
10  00 00 00 00 00 00 00 00 00 00 00 00 00 00
11  80 0A 00 00 00 00 00 00 3F 40 0E
12  18 0 DO 1 VWTR LOOP
13  40 83D4 C! 11 VDPMD E ! ;
14 R->BASE
15
SCR #124
0 ( G6/7 PRIMITIVES - 1/3                                rev. 28SEP89 LW )
1 BASE->R DECIMAL 0 CLOAD STAT? HEX
2 : GR ; \ boundary to delete hi-res graphic routines
3 FF CONSTANT PC 03 CONSTANT SC FF CONSTANT TC
4 : DCOL ( n -- ) ' PC ! ; \ set dot color
5 : SCOL ( n -- ) ' SC ! ; \ set screen color
6 : TCOL ( n -- ) ' TC ! ; \ FUTURE USE ; Text color
7 : CLIP_PIXEL ( n -- f ) \ true if right border exceeded
8   DUP VDPMD E @ 10 = IF 1FF ELSE FF THEN > ;
9
10 : VS ( n -- ) \ set Status Register Pointer
11   8C02 C! 8F 8C02 ! ;
12 : STAT? ( n -- b ) \ read status register
13   VS 8802 C@
14   0 VS ; \ reset SR pointer
15 R->BASE -->
SCR #125
0 ( G6/7 PRIMITIVES - 2/3      GFILL      )
1 BASE->R HEX \ 0 CLOAD GFILL
2 : GFILL ( x y x-dots y-dots color )
3   0 1 VWTR VDPMD E @ DUP 10 = SWAP E = OR
4   IF DUP 4 SLA + THEN ' PC ! 2SWAP
5   BEGIN 2 STAT? 8 SLA 100 AND UNTIL \ VS clear ?
6   SWAP DUP 24 VWTR 8 SRA 25 VWTR \ DX
7   100 + DUP 26 VWTR 8 SRA 27 VWTR \ DY (page 1)
8   SWAP DUP 28 VWTR 8 SRA 29 VWTR \ NX no. x-dots
9   DUP 2A VWTR 8 SRA 2B VWTR \ NY no. y-dots
10  PC 2C VWTR \ color
11  0 2D VWTR \ ARG
12  C@ 2E VWTR \ CMR
13  0 VS \ reset status ptr
14  40 1 VWTR ;
15 R->BASE -->

```


FORTH—

(Continued from Page 18)

Reading status registers is an essential part of using the 9938 and many of its commands. Previous commands must be executed before a new command is issued. Therefore, VS and STAT? are implemented and their use will be illustrated in the following words. GFILL (The G is to distinguish it from Forth's FILL and VFILL) as shown is an implementation of one of the 9938's built-in, high-speed commands. It fills an area (block) of the screen starting at location x/y with x-dots in the horizontal and y-dots in the vertical direction with the color indicated by last parameter. GFILL is used by both GCLS (clear screen) and SCREEN (like CALL SCREEN in XBASIC). GSIZE is a supplementary word which provides full-screen parameters depending on the current VDPMD.

These are all the words needed to use the G6 or G7 modes. DOT and LINE on screens 127 and 128 give you something to play with while exploring these modes. Remember that G6 has twice as many pixels horizontally as does G7 and select your parameters accordingly. For instance, in order to create a square block in G7 mode with GFILL the x-dots and y-dots parameters would be identical while in G6 x-dots must be twice the number of y-dots. Also, you remember that G6 can only accommodate colors from 1-15. That is because in G6 pixels are addressed in pairs, hence only 4 bits are available per pixel (dot) to set the color. The default colors of the 9938 are the same as those of the TI. These colors can be changed (selected from a palette of 512 colors) and how this is done will be the subject of a future article.

As mentioned above, neither G6 nor G7 clears the screen when invoked. This was done so that — if you go to text mode and return to a graphic mode — the graphic screen will still be intact. If it is desirable to clear the screen, words like G6CLS (or G7CLS) can be defined to accomplish it, ie.:

```
: G6CLS      G6  GCLS ;
or an equivalent for G7.
```

A brief article such as this cannot possibly take the place of a manual. Let me just add here that the 9938 uses four registers (0,1,8 and 9) to set up modes ranging from TEXT 1 (40-column) to GRAPHIC 7. Included in these settings are such things as sprite, mouse and lightpen enable/disable, interlace on/off and many more. Other registers control direct access, bank switching, display position, etc. I will try to explain them as they are being used.

(See Page 24)

```
SCR #126
0 ( G6/7 PRIMITIVES - 3/3 )
1 BASE->R  HEX
2 : GSIZE ( --- x y x-dots y-dots )
3         0 0 VDPMD @ CASE 10 OF 200 100 ENDOF
4         11 OF 100 100 ENDOF
5         ENDCASE ;
6 : GCLS  \ clear the screen - blue is the default here
7         GSIZE VDPMD @ CASE 10 OF 4 ENDOF
8         11 OF 3 ENDOF
9         ENDCASE
10        GFILL ;
11 : SCREEN ( n --- ) \ set screen color like XB CALL SCREEN
12        DUP SCOL DCOL 0 0 GSIZE PC GFILL ;
13        \ n may range from 1 - 15 for G6
14        \         and from 1 - 255 for G7
15 R->BASE
```

```
SCR #127
0 ( DOT rev. 05JUN89 LW )
1 \ this is as fast as - if not faster than - PSET
2 0 CLOAD DOT BASE->R DECIMAL 124 CLOAD R->BASE BASE->R HEX
3 \ usage: n DCOL (set color) r c DOT (place pixel on screen)
4 : DOT ( row column --- ) CLIP_PIXEL
5     IF DROP DROP
6     ELSE SWAP VDPMD @ 10 = IF 100 * SWAP 2 / +
7     ELSE 100 * + THEN
8     DUP DUP
9     E SRL 4 + E VWTR \ bits 16, 15 & 14, VRAM access bas
10    8 SLA 8 SRL      8C02 C! \ bits 7 - 0, to port #1
11    2 SLA A SRL      \ bits 13 - 8
12    40 + 8C02 C!    \ set WRITE bit, to port #1
13    PC 8C00 C!     \ color
14    0 E VWTR 0 8C02 C! 0 8C02 C! \ reset addr counter
15    THEN ;      R->BASE
```

```
SCR #128
0 ( LINE rev. 06SEP89 LW )
1 0 CLOAD LINE BASE->R HEX
2 0 CONSTANT XS 0 CONSTANT YS 0 CONSTANT XD 0 CONSTANT YD
3 : LINE ( xs, ys, xd, yd ) ' YD ! ' XD ! ' YS ! ' XS !
4     0 1 VWTR BEGIN 2 STAT? 8 SLA 100 AND UNTIL \ status
5     XS DUP 24 VWTR 8 SRA 25 VWTR \ xs
6     YS 100 + DUP 26 VWTR 8 SRA 27 VWTR \ ys - page
7     XS XD - ABS YS YD - ABS 2DUP 2DUP MAX
8     DUP 28 VWTR 8 SRA 29 VWTR \ Maj
9     MIN DUP 2A VWTR 8 SRA 2B VWTR \ Min
10    PC 2C VWTR \ dot color
11    > IF 0 ELSE 1 THEN \ MAJ
12    XD XS > IF 0 ELSE 4 THEN + \ DIX
13    YD YS > IF 0 ELSE 8 THEN + \ DIY
14    2D VWTR 70 2E VWTR 0 VS 40 1 VWTR ;
15 R->BSE \ usage : n DCOL n n n n LINE
```


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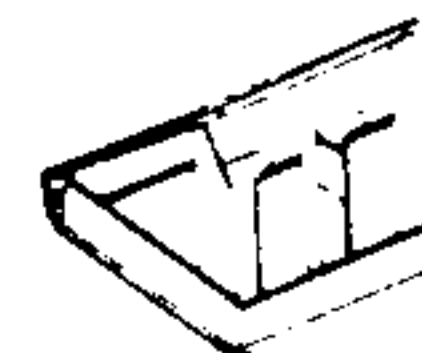
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#4. PRINTART

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#5 ORIGINAL TI SALES DEMO DISK WITH TI-TREK GAME

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#6. EXBASIC MUSIC

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#7. SPACE SHUTTLE MUSIC/GRAPHICS

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

#8. LOTTO PICKER

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

#9. MONA LISA PRINT OUT

This disk prints out a near photo quality picture of that lady with the 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-99/4A. Impresses everyone who sees it! Requires Epson printer compatibility.

#10. GOTHIC PRINT

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

#11. ANIMATED CHRISTMAS CARD "WOODSTOCK"

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

#12. TI-99 OLOPY

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

#13. STRIP POKER (PG RATED)

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

#14. FIGURE STUDY (PG RATED)

A collection of Playboy type centerfolds that can be printed out at your command. Use with any printer.

#15. STAR/EPSON PRINTER DEMO

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

#16. SIDEWAYS PRINTOUT

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

#17. TI FORTH DEMO

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

#18. TI DIAGNOSTIC

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

#19. TI WRITER/MULTIPLAN UPGRADE

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

#20. ACCOUNTS RECEIVABLE

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

#21. DATA BASE DEMO DISK

A professional 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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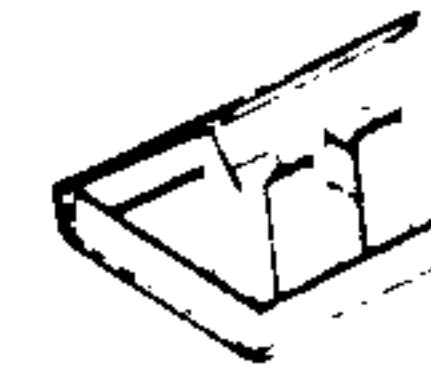
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#22. ASTROLOGY

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

#23. WILL WRITER

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

#24. ENGINEERING CALCULATIONS

A two sided computer 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.

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

#31. MORSE CODE TRAINER DISK

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

#32. EXBASIC XMAS MUSIC

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

#33. CHECKERS & BACKGAMMON

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

#34. SOLITAIRE & SCRABBLE

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

#35. PROGRAMMING AIDS & UTILITIES I

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

#36. STRICTLY BUSINESS

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

#37. LAPD COOKBOOK

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

#38. GREAT 99/4A GAMES VOL. I

A collection of professional games in assembly and exbasic that all load from a menu in exbasic. Includes a great ski game where you dodge the trees in a fast downhill run. We have included only the best.

#39. GREAT 99/4A GAMES VOL. II

Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially.

#40. ARTIFICIAL INTELLIGENCE

This disk contains the 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 bio-rhythm programs so you can analyze all your emotional problems at one sitting.

#41. VIDEO GRAPHS MODULE BACKUP DISK

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

#42. FUNNELWEB FARM UTILITY

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

#43. BEST OF BRITAIN, VOL I

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

#44. LABEL MAKER I GRAPHICS

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

#45. BEST OF BRITAIN, VOL II

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

#46. SUPER TRIVIA 99

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

#47. INFOCOM RAPID LOADER

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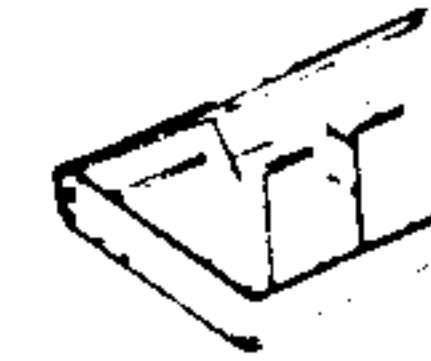
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This Pacman/Munchman type game starts at a slow pace and slowly speeds up to a break-neck pace. A totally new experience.

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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 than on Sat. morning TV. This disk received a standing ovation when previewed at a local users group. We have even included instructions how to do it yourself on the second disk side. This one is a show stopper!!!

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

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

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

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

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

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

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

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

#61. THE MINE
A fast action game from F.R.G. 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 autoloader.

#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 (2x) 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.

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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 Ehninger, 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 1989 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 volume 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 quality 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 SUGHRUE

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

#109. TI-WRITER MINI MANUAL

This disk prints out a five page TI Writer manual with everything you need to know to use TI Writer or the many clones such as 99Writer II. Additional aids for using this powerful word processor are included.

#110. DISK + AID

A powerful disk sector editor formerly sold for \$20. Menu Driven and easy to use.

#111. POP MUSIC & GRAPHICS

This exciting disk from Germany features music/graphics written in 100% assembly and what comes from the TI sound chip is sure to astound you.

#112. INVOICE PACK

An excellent invoice preparation and printing program with instructions on how to modify it for your own business.

#113. LABEL MAKER 3

A collection of label programs to create mailing and disk envelopes, disk labels and much more!

#114. PANORAMA

A drawing and illustration program that compliments Graphx and TI Artist. A must for the serious 99/4A artist!

#115. GRAPHICS DESIGN SYSTEM

A complete system for creating graphic screens in full color for your programs by J. Peter Hoddie. Fully documented.

#116. FOURTH TUTORIAL

A lesson in FORTH programming on how to create graphics.

#117. UNIVERSAL DISASSEMBLER

This powerful utility written in Forth allows disassembly of programs off disk in any format, in memory, and even off of P-Box cards. Very complete with some very unique features.

#118. FAST TERM

One of the most popular and recommended of the 99/4A terminal emulator programs. Supports TE-II, ASCII, and X-Modem transfers, print spooling and more. Loads from Exbasic or E/A.

#119. RAG LINKER

A utility for converting DIS/FIX 80 assembly object code files to PROGRAM image. This allows files to load faster and take up less space on disk. Full Doc

#120. BITMAC

The original BITMAC is now available at \$4.95 with all original documentation. A powerful graphics program for the 4A which lets you print where you want...even over pre-existing text. Create great graphics in 16 colors, print text sideways, mirror image, upside down etc. etc. A must for anyone into 99/4A graphics. Comes with second bonus disk with utilities such as sign & banner makers. Even can computer generate your own signature!

#121. SUPER YAHTZEE & WHEEL II

If you like Yahtzee this disk is for you. A great version written in high speed assembly. Also included is another version of Wheel of Fortune which also lets you create your own puzzles with a puzzle edit program included.

#122. ADULT ADVENTURE

A truly adult adventure for use with the TI Adventure Module. Also included is a bonus adventure (not adult) "LOST GOLD" which is one of the better ones we have seen recently.

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Expanding your system

What'll it be: A PEB or an MES?

By JOHN KOLOEN

Last month I raised the question whether a TI Peripheral Expansion Box (PEB) is a better buy than a CorComp Micro-Expansion System (MES). Well, is it?

Here is the case for the MES:

The MES is only a fraction of the size of a PEB, measuring about 6 inches wide, 6 inches long and 3 inches high. It plugs into the sideport of the TI and allows you to control up to four floppy disk drives (single-sided, single-density through double-sided, double-density), provides a 32K expansion memory as well as an RS232 and parallel port. Unlike the larger PEB, the MES doesn't use a cooling fan, so when it is operating it is silent. The only hardware used to expand the MES is a side-car RAMdisk that plugs into the MES. The RAMdisk comes in 256K and 512K sizes.

It is also easy to move the MES/4A console. If you travel you could take your 4A, MES, power transformers (one for the 4A and one for the MES), RF modulator and a half-height disk drive in a large briefcase. A cartridge or two and a few disks would set you up anywhere there is electricity and a TV. There is nothing portable about the Peripheral Expansion Box.

As for software, a fully-configured MES will utilize most of

the software available for the TI. This includes everything from BASIC to assembly language programs. The only software it can't use is software designed to run with such devices as a hard disk or a clock card. It gets along fine with a speech synthesizer. Any monitor used with a TI, with the exception of monitors that require RGB input, can be used with the MES. Any printer or modem used with a TI may also be used with the MES.

Cost-wise, a new MES with 32K RAM, disk controller and RS232/PIO ports sells for under \$300. Adding a double-sided, double-density floppy drive with power supply and enclosure adds \$150 to the cost. You could use your existing monitor or TV. Which means your out of pocket expense for a new system would be \$450 or less.

Beyond that, you could add up two three more floppy drives at a cost of about \$150 each (including enclosures and power supplies) and a dedicated color or monochrome monitor. (Color monitors are always recommended for use with the 4A.) There are hundreds of monitors made for use with PCs and other computers that are compatible with the TI. And, of course, you can also add a printer and a modem, if you are so inclined.

(See Page 25)

A utility every Geneve owner should have...

A> EXEC

How do you run TI-99/4a Option 5 Editor/Assembler programs? Most people load up GPL, then some option 5 loader, and then finally their program. With Exec, you can now run most E/A Option 5 programs directly from MDOS using one simple command! A dream come true.



Included with Exec are GETKEY and GETSTR, two short external MDOS batch file commands. With these two powerful commands you can create interactive batch files. GETKEY captures single key input, while GETSTR handles string input.

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FORTH—

(Continued from Page 19)

As an example, GFILL starts with 0 1 VWTR and ends with 40 1 VWTR. The second bit of register 1 controls the screen display. If the bit is set, the display is enabled, otherwise it is disabled. Toggling this bit on and off can be used to speed up the processing of commands. It is used in GFILL and, in essence, it should speed up what is already a "high-speed" command. I have not made any quantitative measurements, GFILL executes remarkably fast without this feature and you can leave 0 1 VWTR and 40 1 VWTR out. The only noticeable affect is that the screen "blinks" briefly if the display is disabled and re-enabled.

Line 5 (BEGIN 2 STAT? UNTIL) shows the use of checking status register 2 to ensure that a previous command has been executed before processing the next one. If GFILL is used in a loop to create a variety of blocks on the screen, this will ensure proper execution.

Comments on screens 125 and 128, such as DX, DY, NX, NY etc., refer to the nomenclature used in the 9938 Technical Data Book and are added so I can keep track of what I am doing.

By the way, my original word for LINE did not use constants but instead did some fancy acrobatics with the stack. As I hope to show in a future article, drawing triangles or other geometric shapes with consecutive lines (lines which use the end point of the previous line as their starting point) is much easier if the parameters are still available somewhere. Thus, stack acrobatics were eliminated in favor of constants (which also simplified and shortened LINE considerably). More about that later.

A PEB OR AN MES?

(Continued from Page 24)

So, to put it all together, a MES is relatively inexpensive, gives you access to virtually all software available for the TI, operates silently and can be carried around in a briefcase.

WHY BUY A PEB?

Unless you have plans to get into 80-column cards, the Geneve, hard disks or RAMdisks you would be able to get along fine with a MES. You can add a side-car RAMdisk to the MES but it doesn't enjoy the enormous amount of development that has gone into the popular Horizon RAMdisk for the PEB. You'd be better off with a PEB if you intend to buy a RAMdisk.

The strength of the PEB is that it has plenty of space to expand. Virtually all expansion products for the TI are designed as cards to be inserted into the TI expansion box. And there is a large variety of them, ranging from a Z80/CPM card that is no longer manufactured to the Advanced Video Processor Card by Dijit Systems. The AVPC supports 80-column display on a TI. We'll get into the AVPC and other products in a future issue.

Principal disadvantages of the PEB is that it is heavy and bulky. Because it uses a cooling fan, it is about as noisy in operation as a PC.

Principal advantages of a PEB is that you can pick and choose what cards you want to put in it. And there are a bunch of them. Several manufacturers offer expansion memory cards, RS232 cards, disk controller cards, RAMdisks, you name it. The PEB

has eight slots, seven of which are used for expansion cards. The eighth slot is dedicated to the system card that interfaces with the 4A console.

Another advantage is that the PEB has its own power supply capable of powering all of its cards and at least one internal disk drive. A separate power supply and enclosure for a floppy disk drive add about \$50 to the cost of the drive.

A basic expanded system using a PEB would include the PEB,

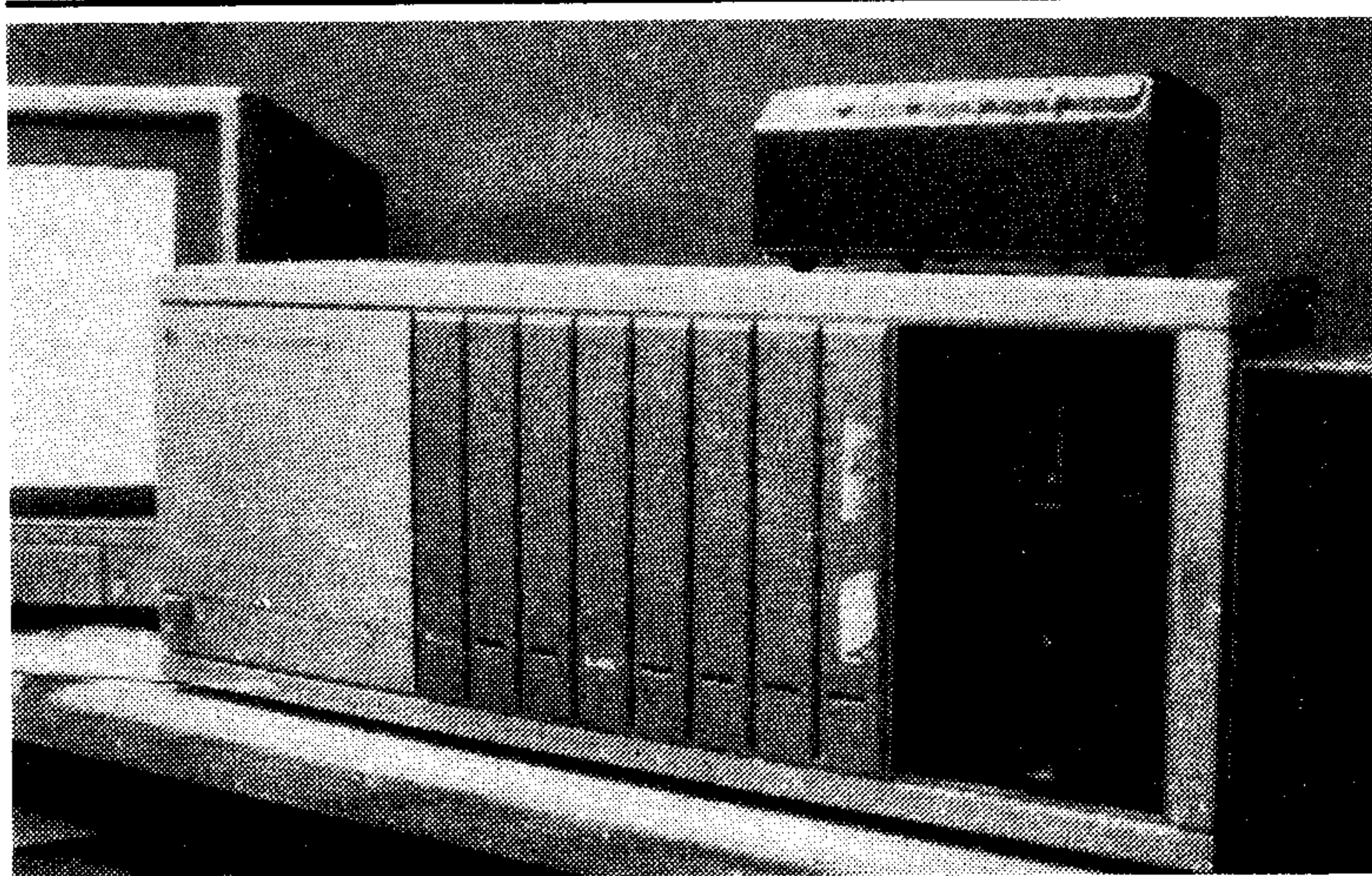
a disk controller (preferably controllers manufactured by Myarc Inc. or CorComp. The TI controller doesn't handle as many disk formats as the others.) Also included in a basic expanded system is a memory expansion and a floppy disk drive.

It's tough to find a new PEB, though some are still available. They sell for about \$150. But don't give too much thought to the price. Used PEBs may also cost \$150. Chances are, if you are in the market for a PEB you'll be buying a used one.

Add to the cost of a PEB the cost of a disk controller (\$150 and up for a new one), a 32K memory expansion (\$100 and up for a new one) and double-sided, double-density disk drive (\$100, more or less) and you are in business for about \$500. Unlike the MES, you still don't have a RS232/PIO port, but you can get a RS232 card for about \$75 new.

Where can you go from here?

Anywhere you want. That's the advantage of the PEB, virtual-
(See Page 26)



The CorComp MES perches comfortably on the top of the comparatively huge Peripheral Expansion Box.

-- ANNOUNCING --

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HOSTED BY: *SouthWest Ninety-Niners - PO Box 17831
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DATE/TIME: *Sat Feb 17, 1990 - 9am to 5pm
Sun Feb 18, 1990 - 9am to 3pm*

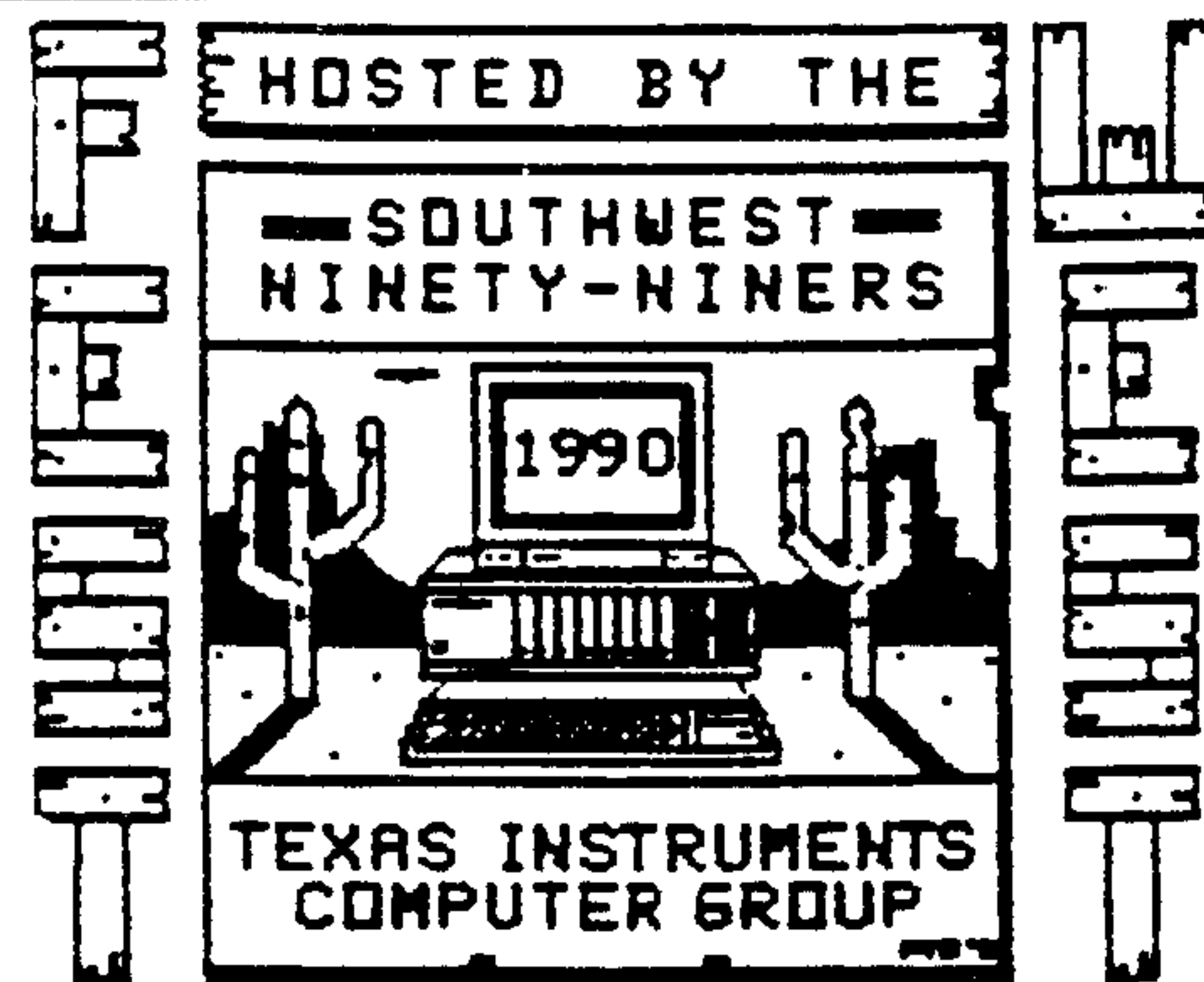
LOCATION: *Day's Inn - 88 E Broadway - Tucson, AZ 85701
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TI Fest West '90 - Best in the West!

Chicago TI Faire report

Geneve environments, FDOS, MIDI interface highlight seminars

By JOHN KOLOEN

There weren't as many new products introduced at this year's Chicago TI Faire as in years past, but for hundreds of visitors and scores of vendors it was a full-day well spent.

The most notable new products was a 512K memory expansion card for the Geneve, expandable to 2 megabytes marketed by Bud Mills Services.

The 7th annual fair, held Nov. 4, featured a series of seminars throughout the day and over 3,000 square feet of exhibition space packed with TI vendors and users.

Seminars were conducted by Bud Mills of Bud Mills Services (Horizon RAMdisk, MEMEX and p-GRAM+), Roger Merritt of Comproline (Artist Printshop, Living Tomb and Jiffy Card), Gary Bowser of Oasis Pensive Abacutors (Super Module Expander and RAMBO), Chris Bobbitt of Asgard Software (PRESS and other releases), Bruce Harrison of Harrison Software (music software), Barry Traver (Genial TRAVeLer Diskazine), Jan Janowski of the Chicago TI User Group (portable TI project), Mike Maksimik of the Chicago user group (MIDI interface and FDOS), Jim Horn of the Mid-Atlantic 99ers (donating TI computers to schools), J. Peter Hoddie of JP Software (MacFlix Professional, IdentiFile and other new software releases), and Lou Phillips of Myarc Inc. (Geneve).

Perhaps one of the reasons that new products weren't being introduced at the Chicago fair is that so much remains under development. Many of the seminar speakers focused their presentations on what users can expect in the future — near

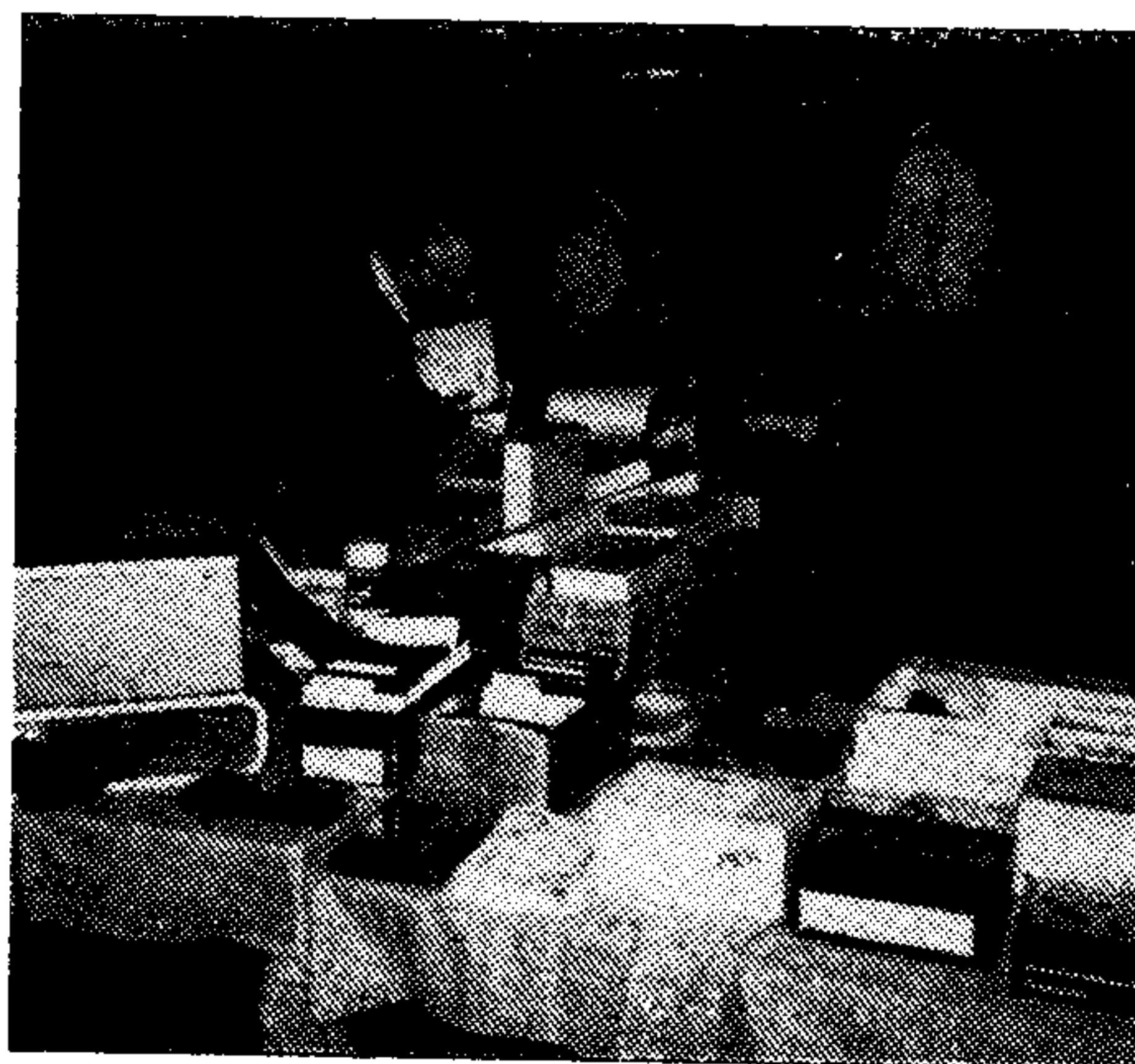


Photo by Gary Cox

Fair-goers had plenty to choose from. and far — rather than what they can go out and buy today.

A case in point is Gary Bowser of OPA. He described an operating system for the Geneve similar to GEM by Digital Research that would replace MDOS and the GPL interpreter. He expects the product to be marketed early in 1990. Judging from his presentation, the product would be in direct competition with Myarc's GEME, which is also under development.

Bowser also discussed a card with a Yamaha sound chip that would allow the programming of digitized sound. It would include an input for CD players and support 16-bit sound. It is Geneve-compatible and would be priced at about \$100. No marketing date was mentioned.

Similarly, Bowser is continuing his project to develop a Z80 co-processor for the TI. The project has been underway for several years but still isn't near enough to completion to make marketing plans.

When Chris Bobbitt of Asgard Software spoke, everyone was listening for news about PRESS, the long-awaited word-processing software that was supposed to be introduced at last year's Chicago fair.

Although a release date wasn't announced, Bobbitt described some of the new features that are being incorporated into the program as the debugging continues. Noting that the program consists of 250,000 lines of assembly language code, he said those that prepaid for the program could have their money back if they didn't want to continue waiting for delivery.

PRESS is compatible with the 4A and the Geneve and supports a variety of devices — ranging from GRAM cards to RAMdisks — and allows for unlimited length text files, even on the 4A. It uses the keyboard, a mouse or joystick for input and features pull-down menus.

One of the most intriguing seminars was conducted by Mike Maksimik who demonstrated an electronic keyboard under
(See Page 27)

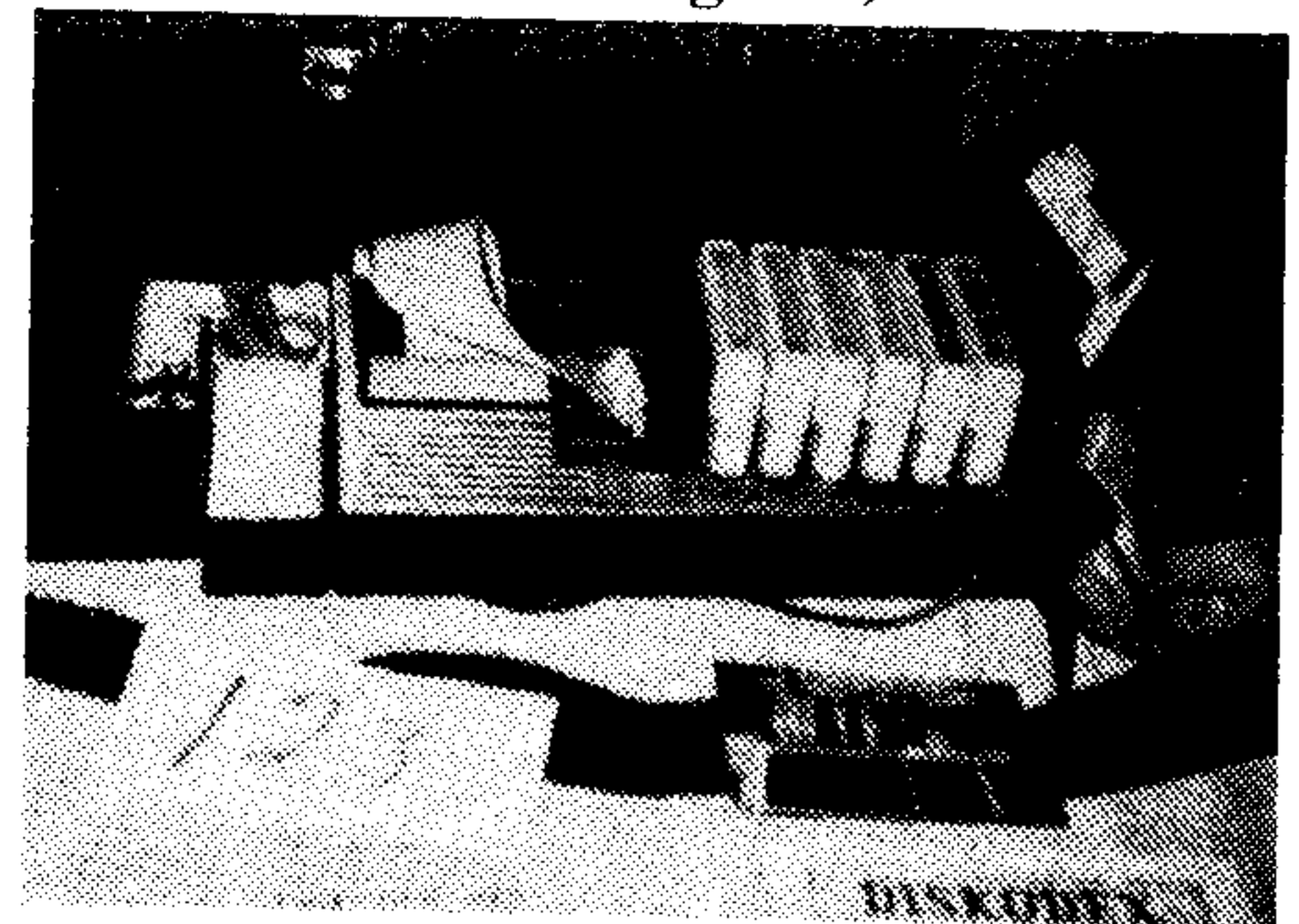


Photo by Gary Cox

A multi-cartridge board under development by OPA.

EXPAND—

Continued from Page 25)

ly everyone who manufactures a hardware product for the TI makes sure it is compatible with the PEB. Peripheral Expansion Cards are what give the TI its power.

TALKING TURKEY

The above prices are for new equipment. Prices for used equipment bounce all over the map. Some advertisers in MICROpendium offer a "full TI PE Box" for as little as \$350. A "full" box presumably includes a disk controller, memory expansion, RS232 card and a disk drive. Used MES systems are harder to come buy,

but you can expect to pay as little as half the original cost when you find one.

Other sources for used equipment are electronic bulletin boards and user groups. If you venture into the general market, such as flea markets, the prices will be even lower but your risk of purchasing defective equipment is much greater. Most actual users of computers take very good care of their equipment and manuals, and so the risk of a bad buy is greatly reduced.

Next month: How to select a monitor.

CHICAGO—

(Continued from Page 26)

the control of a TI. The full-sound of the keyboard/speakers surprised many in the audience as it played classical music under the direction of the 4A console. A college student, Maksimik said that no hardware modifications were required to make the system work. The only expense was an RS232 cable to connect the TI to the Casio electronic keyboard, and the Casio, which cost \$100, and a short assembly language program written by Maksimik.

The musical score is in text-file form on the TI and is sent at 31,200 baud to the Casio. He said that IBM-compatible music MIDI files are directly compatible with the TI in text-file (or ASCII) format.

Another Maksimik project is FDOS, a programming environment for the 4A. It includes internal and external commands that can be executed by the user at any time. Internal commands are those that are loaded into memory when FDOS is booted and remain in memory. These include frequently used commands such as DIR to run a

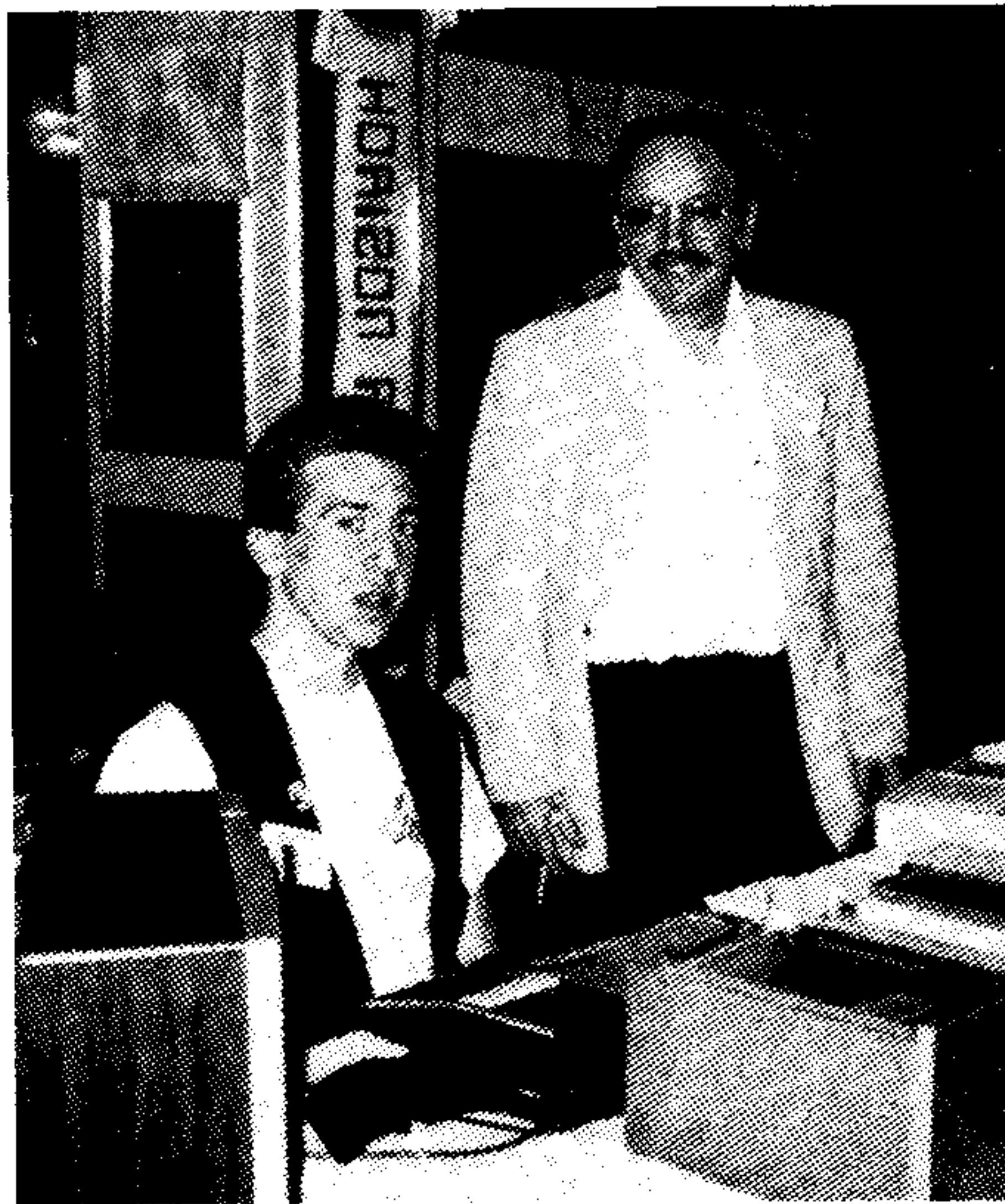


Photo by Gary Cox

Bud Mills is all smiles after adding several hardware products to his line. directory. Less common commands remain on disk similar to the way that Microsoft DOS works on a PC. These commands are loaded into memory when called. The program runs in SuperCart. The version

demonstrated was V2.0. Maksimik said that future versions would support hard disks.

One hardware item that was ready for the market is p-GRAM+ by Bud Mills Services. The card is an upgrade of the p-GRAM card. It adds 120K of GRAM for a total of 160K of GROM emulating memory. The P-GRAM+ is priced at \$280. The cost of upgrading a P-GRAM card to a P-GRAM+ is \$100.

Mills also introduced the MEMEX card for the Geneve. Created by Ron Walters, the card provides 512K of CUP expansion RAM to the Geneve. It is expandable to 2 megabytes. The cost is \$245.

MILWAUKEE FAIR

The Milwaukee TI Fair, held Nov. 5 as a companion event to the Chicago fair, featured about a dozen vendors, many of them coming up from the Chicago fair. There seemed to be more deals available on used software and hardware than at the Chicago fair. Several seminars were also held throughout the day.

Myarc product update

For the first time in several years, interest at the Chicago TI Faire wasn't riveted on Myarc Inc. And that is probably a relief to everyone.

Once again, however, Myarc's Lou Phillips spoke at the final seminar of the Nov. 4 fair, and promised that Geneve buyers soon will receive copies of the long-awaited Myarc Advanced BASIC, as well as finished versions of the MDOS operating system, one for floppy disks and a second for use with hard disk systems.

The Pascal run-time is still in limbo, however. Phillips blamed the problem on the developers, formerly called Pecan Software. Myarc, he said, hired a lawyer "to get them to communicate." He said that the p-system thus far loads software but crashes.

As for MDOS, Phillips said that V1.14G "hopefully, will be the finished version." The hard disk version of MDOS, as well as MDOS, are expected to be mailed to all buyers whether they have a hard disk system or not. The final version of Advanced BASIC will be numbered V3.0. Also included with the mailing to registered owners will be brochures about software that runs on the Geneve.

Phillips noted that Myarc finally has the source code to the TI-Writer formatter and will be modifying it for use with MY-Word.

Phillips also updated the audience on other Myarc projects:

- Computer Aided Design program — being developed by

Jeff Cook for a "psuedo-desktop publishing system." The program "uses many routines from MY-Art," is not an auto-cad system and will retail for \$100 or less.

- GEME — A graphics-oriented windowing environment, being developed by Barry Boone, supports multi-tasking and will include a version of Advanced BASIC that runs under GEME control. No date of availability was mentioned.

- Quick BASIC Compiler — A compiler to make BASIC programs run "10 times faster." Modeled on Microsoft's Quick BASIC for the PC, it would require all of the Geneve's memory to run. It would run in two modes: 64K mode without memory mapping; Large Memory, with memory mapping. The compiler would allow debugging as each statement is executed.

- 2-Megabyte Card — Myarc worked with Ron Walters on this project for the Geneve. It is available from Bud Mills Services for \$245 with 512K of RAM.

- 18 Mhz Version of the Geneve — Paul Charlton is developing this project. The system would be comparable in speed to an IBM PS/2 Model 30. Phillips said that current Geneve cards could be upgraded to the 18 Mhz version. No release date was mentioned.

- Streamer-tape Backup — John Birdwell is developing the software for this system. Phillips predicted that it would be available "shortly."

(See Page 28)

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MYARC—

(Continued from Page 27)

Phillips noted that a version of MDOS that would handle both floppy and hard drives using the Myarc HFDC on the Geneve isn't available yet. Version 1.30 of Myarc Disk Manager 5 will work with V.96h of MDOS and will allow 720K 3.5-inch floppies to be formatted if an 80-track EPROM is installed in the HFDC.



Photo by Gary Cox

Concerning an EPROM-based version of DOS, Phillips said that few users are interested in it. Such as system wouldn't have the memory to support hard disk drives nor could it be updated easily. A suggestion was made that an EPROM be placed on a multi-function card that Myarc is developing. The card is designed to support a speech synthesizer as well as providing a lock for protected software used with the system. Thus far, no Geneve software is protected.

Myarc's Lou Phillips sets up a Geneve.

Bud Mills markets RAM expansion for 9460

Bud Mills Services is offering a 512K memory expansion card for the Geneve that is expandable to 2 megabytes. The card was developed by Ron Walters.

The MEMEX card provides 504K of CPU expansion RAM, with an additional 8K reserved for the Geneve's Device Service Routine requirements. The memory may be configured by the user as additional program memory, as RAMdisk, as print spooler, etc. The card, with 512K on board, sells for \$245.

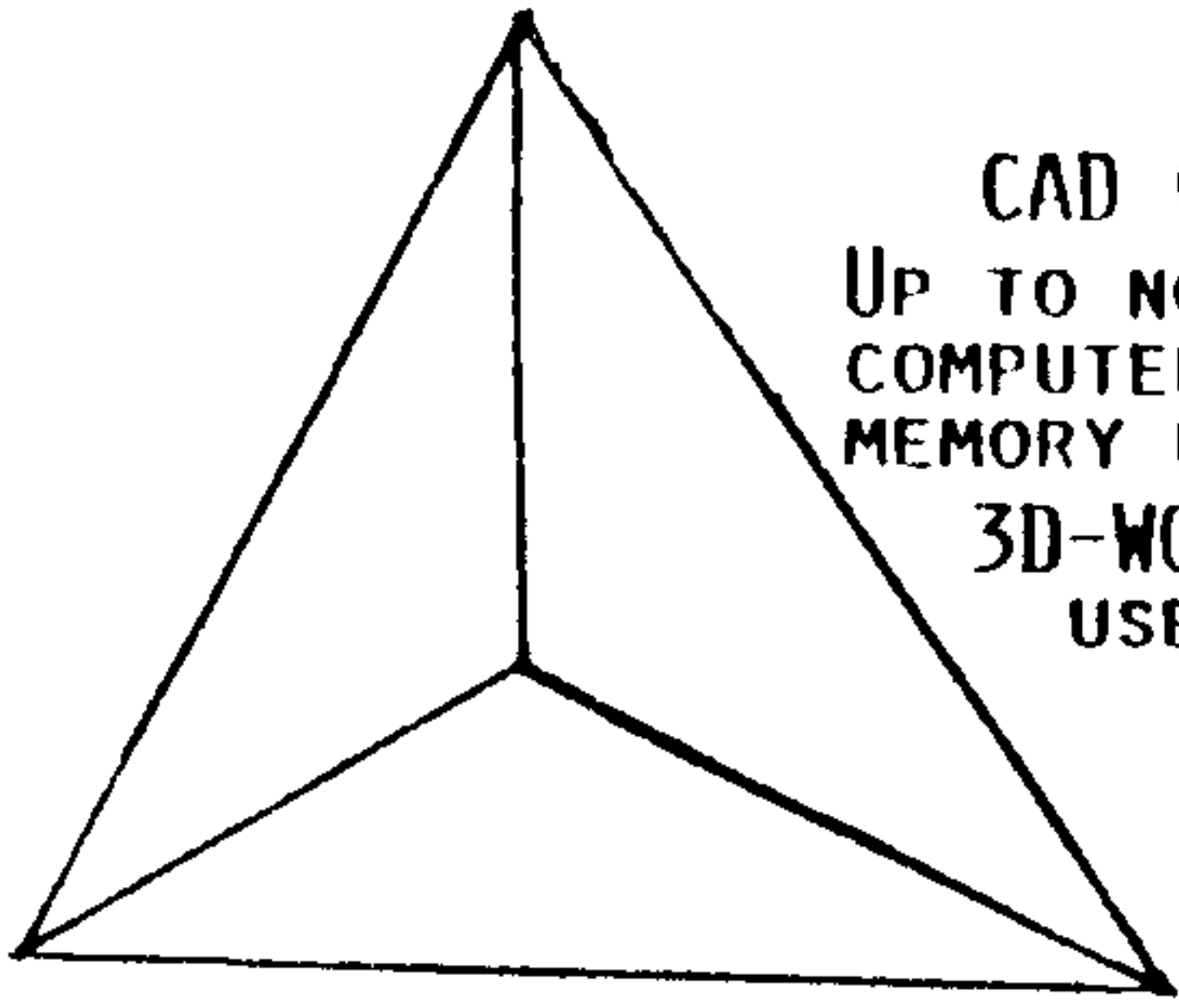
The card uses Dynamic RAM (DRAM) and is fully socketed for a full 2 megabytes, including the RAM that comes with the Geneve itself. A model of the card that was demonstrated at the Lima (Ohio) User Group fair earlier this year used Static RAM. Static RAM chips are more expensive than DRAM. A 512K card using SRAM would have cost twice as much as the DRAM version, according to Walters.

The board comes with all chip select and refresh logic on board. Expansion beyond 512K requires "a relatively simple mod to the Geneve," Walters said. "MDOS already transparently supports the add-on memory."

"The disadvantage with DRAM, though, is the relatively complex memory refresh requirement which has been resolved on this board with a proprietary design which I have licensed to Horizon (Bud Mills) through my company, Dynamic Systems Research Inc."

The card uses 80-nanosecond, 1 megabit (256K x 4 bit) DRAMs and can support zero wait state operation. Zero wait state support, about 20 percent faster than the Geneve, requires a modification to the Geneve.

For more information contact Bud Mills Services, 166 Dartmouth Dr., Toledo, OH 43614, or call 419-385-5946.



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BITMAC is a comprehensive graphics program for the TI-99/4A computer which allows you to easily place "dots" on the screen in any position and in a choice of 16 colors. You can print text ANYWHERE, even on top of existing text! You can print text sideways, upside down, in mirror image, in 16 colors and a multitude of other ways. But BITMAC text is only a small part of this unique program. Other features of BITMAC will allow you to do things like SIGN your name, make perfect circles ANYWHERE, draw lines from any point of the screen to any other point, make perfect rectangles in EXACTLY the position you want them and much more!

BITMAC has provisions for trackballs, joysticks and even a second computer input! If you have a second computer such as an IBM PC, an Apple Macintosh even an IBM 370 main frame there are provisions for your second computer to create graphics with BITMAC!

BITMAC can make "slide presentations" for group meetings (and print the graphics!), give hours of "just doodling" pleasure, create charts for a stock holder report, print camera ready art for business ads, make still cartoon sequences (and print them in one of two sizes), create mechanical drawings, draft floorplans and many other uses!

BITMAC, with a second computer, can plot satellite data, statistical data, computer generated art plots, analog sampled data and just about anything your second computer can throw at BITMAC.

BITMAC offers BOOLEAN disk input (just like NASA enhances photos!) and a wealth of computer enhancement techniques that lend raw power to your ability to manipulate bitmapped graphics.

Fully compatible with both TI and CorComp Disk Controller Cards. **NOTE:** Compatible only with Epson, Star or other fully Epson compatible dot matrix printers

BITMAC offers icon input that allows you to point at the functions you want. Nothing was spared in making BITMAC easy and simple to use

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AARDVARK

Avoid the aardvark and reach the mound

Aardvark is an Extended BASIC game by Patrick Pelletier of Montreal. The program was published in Tijdingen, the newsletter of the TI user group in Holland.

The object of the game is to maneuver an ant from the bottom of a maze of passages to the safety of a mound near the surface. The enemy is an aardvark whose long tongue randomly searches the passage ways in search of a free lunch.

The ant is maneuvered with a joystick. The ant can move in any direction during each move. Direction and movement are determined by the position of the joystick.

Points are scored for each ant that eludes the aardvark. A perfect score would require the movement of five ants to the mound.

AARDVARK

```

100 ! *****
!021
110 ! * *
!087
120 ! * AARDVARK *
!163
130 ! * BY *
!178
140 ! * PATRICK PELLETIER *
!011
160 ! * MONTREAL *
!115
170 ! * P.Q. CANADA *
!172
180 ! * *
!087
190 ! *****
!021
200 !!131
210 ! 99ER VERSION 2.8 1XB !
149
220 !!131
230 CALL CLEAR !209
240 DISPLAY AT(2,11):"AARDVA
RK" !169
250 DISPLAY AT(4,5):"BY PATR
ICK PELLETIER" !204
260 DISPLAY AT(8,1):"THE GOA
L OF" !013
270 DISPLAY AT(10,1):"THE GA
ME IS" !053
280 DISPLAY AT(12,1):"TO EAT
THE" !253

```

```

290 DISPLAY AT(14,1):"FOOD B
EFORE" !093
300 DISPLAY AT(16,1):"BEING
EATEN" !086
310 DISPLAY AT(23,3):"PRESS
A KEY" !091
320 CALL KEY(0,K,S):: IF S=0
THEN 320 !133
330 AH=49 :: AV=104 :: TIM=0
:: OEUF=2 :: ANT=25 !150
340 CALL CLEAR :: CALL MAGNI
FY(4):: CALL SCREEN(8)!079
350 CALL CHAR(36,"00")!REPLA
CE !130
360 CALL CHAR(97,"00")!010
370 CALL CHAR(96,"18181818
181818")!255
380 CALL CHAR(98,"1818181F1F
00")!062
390 CALL CHAR(99,"000000FFFF
00")!078
400 CALL CHAR(100,"000000F8F
8181818")!049
410 CALL CHAR(101,"181818F8F
8000000")!050
420 CALL CHAR(102,"0000001F1
F181818")!037
430 CALL CHAR(103,"03060C183
060C080")!038
440 CALL CHAR(94,"AA55AA55AA
55AA55")!101
450 CALL CHAR(112,"0000000000
010387C")!003
460 CALL CHAR(120,"287060101
83F4F12")!051
470 CALL CHAR(40,"8484A4A5ED
EDFFFF")!153
480 CALL COLOR(2,13,8)!230
490 CALL CHAR(128,"0319070D1
F3E702103000000000000000071F3
FFFFFFDD81830000000000000000"
)!111
500 CALL CHAR(132,"80C0F0F8F
CFFDFCFE700000000000000000080
81870E0C08000000000000000000"
)!114
510 CALL CHAR(136,"0C05071D3
F7E202123000000000000000C71F3
FFFFFFDD81830000000000000000"
)!144
520 CALL CHAR(140,"80C0F0F8F
CFFDFCFE7000000000000000000000
00000000C0F0FE000000000000000"

```

```

)!117
530 CALL COLOR(1,8,8)!184
540 CALL COLOR(8,7,3,9,7,1,1
0,7,3,11,2,1,12,14,1)!183
550 CALL HCHAR(1,1,32,768)!2
33
560 FOR I=9 TO 24 :: CALL HC
HAR(1,1,94,32):: NEXT I !088
570 RESTORE 750 !077
580 FOR I=9 TO 22 !116
590 READ ZZ$ !111
600 DISPLAY AT(1,1):ZZ$ :: N
EXT I !227
610 CALL HCHAR(8,1,40,32)!17
4
620 FOR I=3 TO 7 :: CALL COL
OR(1,2,8):: NEXT I !036
630 CALL HCHAR(10,3,112):: C
ALL HCHAR(2,3,112,5)!085
640 FH=22 :: FV=30 !131
650 CALL HCHAR(FH,FV,120)::
CALL HCHAR(2,26,120,5)!140
660 CALL SPRITE(#1,128,5,AH,
AV,#2,132,5,AH,AV+30)!218
670 DISPLAY AT(2,11)SIZE(9):
"AARDVARK" !003
680 CALL JOYST(1,X,Y)!129
690 IF X=-4 THEN LET FV=FV-1
:: GOTO 830 !090
700 IF X=4 THEN LET FV=FV+1
:: GOTO 890 !211
710 IF Y=4 THEN LET FH=FH-1
:: GOTO 950 !245
720 IF Y=-4 THEN LET FH=FH+1
:: GOTO 1020 !252
730 IF TIM>=5 THEN LET TIM=0
:: GOSUB 1330 !209
740 GOTO 680 !249
750 DATA "^^^^^^^^^^^^$^^^^^
^^^^^^^^^^^^", "$$^^^^^^^^^$^^
^^^^^^^^^^^^" !180
760 DATA "^^$$$$$$$$$$$$$$$$
$$$$$$$$^", "^^^^^$^$^$^$^$
^$^$^$^$^$^" !092
770 DATA "^^^^$$$^$^$^$^$^$
^$^$^$^$^", "^^^^$^$$$$$$$$$
$^$^$^$^$^$^" !184
780 DATA "^^^^$^$^$^$^$^$
$$$$$^$^", "^^^^$^$$$$$$$$$
^$^$^$^$^$^" !102
790 DATA "^^^^$$$^$^$^$^$^$
$^$^$^$^", "^^^^^^^^$^$^$^$

```


Word processing that works

99-WRITER II TI-Writer Without The Cartridge! ONLY \$ 9.95 WITH MANUAL

Contains a menu-driven assembly language program which allows the user to load and execute the TI-Writer text editor, text formatter, and utility programs, without the TI-Writer cartridge. Includes an all new easy-to-follow manual. Also features a custom StarSoft designed true lowercase character set, to make TI-Writer text more readable. The updated, TI-Writer text editor (EDITA1 and EDITA2) and text formatter (FORMA1 and FORMA2) files are also included on the disk, making this package a complete word processing system. Requires 32K memory expansion, 1 or more disk drives and either the Extended Basic, Mni Memory, or Editor/Assembler cartridge. Disk only. **\$9.95**

99-WRITER II

**57 PAGE
MANUAL
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**TI-99/4A AUTO SPELL-CHECK
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Disk based editing aid for TI-Writer from Dragonslayer Software. *Spell-Check* scans your TI-Writer file and lists questionable words. You edit the list, then *Spell-Check* updates the file or adds words to a user dictionary. Comes with 20,000 word dictionary (Requires 32K Memory Expansion, Disk Controller, and 1 to 3 Disk Drives and TI-Writer or Editor/Assembler

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you can still create mounds of text, up to 12,286 characters (36,782 with memory expansion), insert and delete characters, lines or paragraphs easily and let word wrap shape your text. You can also display line number and reformat your work to neat margins whenever you want, search and easily find key words or phrases or set left and right margins and tabs from the keyboard

allows you to load and save from disk or cassette, as well as print a hard copy. Requires RS232 Interface and printer cable or PIO Plus Interface and Printer

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Automatically indents paragraphs, justifies right margin, wraps words, overstrikes and underlines, moves and copies text. Documents its own re-formatting. Expands the display to 40 columns and scrolls horizontally to allow full 80-character lines. (Requires Disk System, 32K Memory Expansion, Printer and RS232 Interface) **\$14.95**

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AARDVARK—

(Continued from Page 32)

```

1420 CALL SOUND(1500,-5,10)!
067
1430 FOR I=1 TO 13 !108
1440 READ AA,BB,CC !137
1450 CALL HCHAR(AA+1,BB,CC)!
234
1460 NEXT I !223
1470 GOSUB 2390 !175
1480 RETURN !136
1490 DATA 20,14,36,19,14,36,
18,14,36,17,14,36,16,14,36,1
5,14,36,14,14,36,13,14,36 !0
59
1500 DATA 12,14,36,11,14,36,
10,14,36,9,14,36,8,14,36,0,0
,0,0,0,0 !214
1510 DATA 14,20,36,14,19,36,
14,18,36,13,18,36,13,17,36,1
3,16,36,13,15,36 !146
1520 DATA 13,14,36,12,14,36,
11,14,36,10,14,36,9,14,36,8,
14,36,0,0,0,0,0,0 !127
1530 DATA 10,24,36,10,23,36,
10,22,36,10,21,36,10,20,36,1
0,19,36 !196
1540 DATA 10,18,36,10,17,36,
10,16,36,10,15,36,10,14,36,9
,14,36,8,14,36,0,0,0,0,0,0 !
041
1550 DATA 10,4,36,10,5,36,10
,6,36,10,7,36,10,8,36,10,9,3
6,10,10,36 !073
1560 DATA 10,11,36,10,12,36,
10,13,36,10,14,36,9,14,36,8,
14,36,0,0,0,0,0,0 !115
1570 DATA 12,8,36,12,9,36,13
,9,36,13,10,36,13,11,36,13,1
2,36,13,13,36,13,14,36 !148
1580 DATA 12,14,36,11,14,36,
10,14,36,9,14,36,8,14,36,0,0
,0,0,0,0 !214
1590 DATA 15,9,36,15,10,36,1
4,10,36,13,10,36,13,11,36,12
,11,36,11,11,36 !063
1600 DATA 10,11,36,10,12,36,
10,13,36,10,14,36,9,14,36,8,
14,36,0,0,0,0,0,0 !115
1610 DATA 13,7,36,12,7,36,12
,8,36,11,8,36,10,8,36,10,9,3
6 !183
1620 DATA 10,10,36,10,11,36,
10,12,36,10,13,36,10,14,36,9
,14,36,8,14,36,0,0,0,0,0,0 !
021
1630 DATA 18,16,36,17,16,36,
16,16,36,15,16,36,14,16,36,1
3,16,36 !241
1640 DATA 13,15,36,13,14,36,
12,14,36,11,14,36,10,14,36,9
,14,36,8,14,36,0,0,0 !037
1650 DATA 17,11,36,16,11,36,
15,11,36,15,12,36,15,13,36 !
046
1660 DATA 15,14,36,14,14,36,
13,14,36,12,14,36,11,14,36,1
0,14,36,9,14,36,8,14,36,0,0,
0,0,0,0 !212
1670 DATA 8,14,96,9,14,96,10
,14,96,11,14,96,12,14,96,13,
14,96 !155
1680 DATA 14,14,96,15,14,96,
16,14,96,17,14,96,18,14,96,1
9,14,96,20,14,96,21,14,96,0,
0,0,0,0 !114
1690 DATA 8,14,96,9,14,96,10
,14,96,11,14,96,12,14,96,13,
14,98,13,15,99,13,16,99,13,1
7,99 !185
1700 DATA 13,18,100,14,18,98
,14,19,99,14,20,99,0,0,0,0,0
,0 !220
1710 DATA 8,14,96,9,14,96,10
,14,96,10,14,98,10,15,99,10,
16,99,10,17,99,10,18,99,10,1
9,99 !185
1720 DATA 10,20,99,10,21,99,
10,22,99,10,23,99,10,24,99,0
,0,0,0,0,0 !078
1730 DATA 8,14,96,9,14,96,10
,14,101,10,13,99,10,12,99,10
,11,99,10,10,99 !103
1740 DATA 10,9,99,10,8,99,10
,7,99,10,6,99,10,5,99,10,4,9
9,0,0,0,0,0,0 !229
1750 DATA 8,14,96,9,14,96,10
,14,96,11,14,96,12,14,96,13,
14,101,13,13,99,13,12,99,13,
11,99,13,10,99 !125
1760 DATA 13,9,98,12,9,100,1
2,8,99,0,0,0,0,0,0 !147
1770 DATA 8,14,96,9,14,96,10
,14,101,10,13,99,10,12,99,10
,11,102,11,11,96 !136
1780 DATA 12,11,96,13,11,101
,13,10,102,14,10,96,15,10,10
1,15,9,99,0,0,0,0,0,0 !055
1790 DATA 8,14,96,9,14,96,10
,14,101,10,13,99,10,12,99,10
,11,99,10,10,99,10,9,99,10,8
,102,11,8,96 !011
1800 DATA 12,8,101,12,7,102,
13,7,96,0,0,0,0,0,0 !176
1810 DATA 8,14,96,9,14,96,10
,14,96,11,14,96,12,14,96,13,
14,98,13,15,99 !080
1820 DATA 13,16,100,14,16,96
,15,16,96,16,16,96,17,16,96,
18,16,96,0,0,0,0,0,0 !064
1830 DATA 8,14,96,9,14,96,10
,14,96,11,14,96,12,14,96,13,
14,96,14,14,96,15,14,101,15,
13,99,15,12,99 !133
1840 DATA 15,11,102,16,11,96
,17,11,96,0,0,0,0,0,0 !026
1850 RESTORE 1670 !233
1860 RETURN !136
1870 RESTORE 1690 !253
1880 RETURN !136
1890 RESTORE 1710 !017
1900 RETURN !136
1910 RESTORE 1730 !037
1920 RETURN !136
1930 RESTORE 1750 !057
1940 RETURN !136
1950 RESTORE 1770 !077
1960 RETURN !136
1970 RESTORE 1790 !097
1980 RETURN !136
1990 RESTORE 1810 !118
2000 RETURN !136
2010 RESTORE 1830 !138
2020 RETURN !136
2030 RESTORE 1490 !052
2040 RETURN !136
2050 RESTORE 1510 !072
2060 RETURN !136
2070 RESTORE 1530 !092
2080 RETURN !136
2090 RESTORE 1550 !113
2100 RETURN !136
2110 RESTORE 1570 !133
2120 RETURN !136
2130 RESTORE 1590 !153
2140 RETURN !136
2150 RESTORE 1610 !173
2160 RETURN !136
2170 RESTORE 1630 !193
2180 RETURN !136
2190 RESTORE 1650 !213
2200 RETURN !136
2210 CALL CLEAR :: CALL DELS
PRITE(#1):: CALL DELSPRITE(#
2)!210
2220 CALL CHAR(140,"780B0C1F
3F373F0F1E46AF532519020C8000
0000000000000000F0FCFEFEF850CF
(See Page 34)

```


AARDVARK—

(Continued from Page 33)

```

")!009
2230 CALL SPRITE(#1,128,5,49
,180,#2,132,5,49,207)!226
2240 CALL SPRITE(#3,140,14,1
08,180)!203
2250 CALL COLOR(8,2,1)!178
2260 DISPLAY AT(6,5):ANT-25,
" ANTS" !180
2270 DISPLAY AT(15,5):OEUF-2
" FOOD" !091
2280 DISPLAY AT(21,1):"PRESS
A KEY TO ST
ART AGAIN." !150
2290 CALL KEY(0,K,S):: IF S=
0 THEN 2290 !062
2300 CALL DELSPRITE(ALL)!115
2310 GOTO 230 !053
2320 END !139
2330 FOR R=1 TO 10 :: CALL P
ATTERN(#1,136):: CALL PATER
N(#2,140)!126
2340 CALL SOUND(-1,3000,0,-8
,0)!044
2350 CALL PATTERN(#1,128)::
CALL PATTERN(#2,132)!140
2360 FOR Z=1 TO 25 :: NEXT Z
!242
2370 NEXT R !232
2380 RETURN !136
2390 FOR I=1 TO 4 :: CALL PA
TTERN(#2,140)!191
2400 CALL SOUND(-1,110,0,-8,
0)!250
2410 CALL PATTERN(#2,132)!00
3
2420 FOR Z=1 TO 25 :: NEXT Z
!242
2430 NEXT I !223
2440 RETURN !136

```

READER TO READER

Alain Maillet would like to know how he can get to know the "text to speech rules" on the diagram on page 33 of the TEMU II owner's manual, in order to conceive data corresponding to those given by "CALL SPGET". This would permit building a converter to make the TI speak with its owner's voice. Write him at "Guesdin," 17610 Chaniers, France.

Duane Wangen wants to know where to get service information for PreCom Stand Alone Disk Drive Model TX99-S1 and for the UltraComp Systems Communications Interface model COM-232/PIO. Write him at Duane Wangen, Box 28, Bottineau, ND 58318.

Dan Eicher, P.O. Box 17401, Indianapol-

is, IN 46217, writes that he is "slowly" trying to write a collection of diagnostic routines for the TI, and would like to hear from persons who have written such routines and are willing to share the source codes. He would also like to hear from other owners of 9918s (Armadillos), with the thought of starting an informal newsletter if there is enough interest.

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

USER GROUP UPDATE

The following are additions and updates to our user group listings, begun in May 1987.

★ California ★

Redding Area Texas Instruments Newest Group (RATING), c/o Eugene Barrett, 4432 Honeycomb, Redding, CA 96003. Founded April 1989.

★ Pennsylvania ★

Lehigh 99ers Computer Group, c/o Jack Zawediuk, 719 North 12th St., Allentown, PA 18102. Phone: (215) 821-1043. (New address.) Meets third Monday of month at Sacred Heart Hospital conference room. Annual dues \$12.

★ Texas ★

Mid-Cities/FLUG Users Group, 313 Melorine Dr., Grand Prairie, TX 75051-4138. Marty McCain, newsletter librarian/editor, (214) 262-0452. Merger of the Forest Lane Users Group with the Mid-Cities User Group. Meets at 2 p.m. second Sunday of month at the Parke Mall Community Room in Arlington, Texas (next to Sears).

Keep us posted

Have a new product to announce, or an update of an older one. Let MICROpendium's TI and Geneve readers know. Send us a Newsbyte and we'll get the word out and it won't cost you a dime.

1990 TI FAIRS

FEBRUARY

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

MARCH

TICOFF (TI Computer Owners' Fun Faire — The IBM & Clone Owners' Fun Faire), 9:30 a.m.-4 p.m. March 17, Roselle Park, New Jersey. For information, call Bob Guellnitz, (201) 382-5963, Art Byers (915) 528-5402 or the TICOFF BBS (201) 241-8902.

APRIL

Canadian TI-FEST, April 28, Merivale High School, Nepean, Ontario,

Canada. For information, contact Ruth O'Neill, 34 McLeod St., Ottawa, Ontario, Canada K2P 0Z5 or (613) 234-8050 or CompuServe 72117,3541 or Delphi REON.

MAY

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

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

Jiffycard

An easier way to print greeting cards

By JIM LUQUE

How many of you have ever tried making a 4-fold greeting card and found you either had too many steps to follow, couldn't see your total creation on the screen, or the finished product took longer than the first quarter of a football game to print?

Well, despair no longer. Jiffycard V1.2 solves those problems, and provides fun as an added bonus.

Jiffycard V1.2 offers more flexibility, easier on-screen editing and a few more options not found in version 1.0. With V1.2, one can place graphics virtually anywhere on the screen, and overlap graphics for special effect. Text can be shifted left-to-right, as well as placing large text lines anywhere. Some punctuation can be used on the front of the card, and nearly all punctuation can be used on the inside. And for creative persons, you can now enter your own custom-designed borders. Lines and boxes for 3D maps and graphics (for the inside of the card only) are also new. Finally, a new block character can be used for large letters, frames and pictures.

Like its brother Jiffyflyer V3.0, it contains many of the new enhancements that Jiffyflyer V1.0 didn't have. (Jiffyflyer V1.0 was reviewed in the May 1989 MICROpendium.—Ed)

Jiffycard autoloads from Extended BASIC in about a minute. In fact, Jiffyflyer (3.0) users will feel at home with Jiffycard, as it looks and operates much the same. Documentation is found on the professionally well done "booklet." On the back of the booklet are examples of CSGD graphics available on the disk, and a "Getting Creative" section for hints on overlapping graphics and creating multiple title lines.

When Jiffycard is booted a beautifully colored bordered screen appears. Press the colon/semicolon key twice. (I mention this now as you may be deep into your card creation and ready for the bottom half of your card, when, lo and behold, you find you forgot how to get to the bottom half, or worse yet, you didn't read the documentation! To work on the inside of the card, press the "/" key.) Now hit the semicolon

Review

Report Card

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

Cost: \$15 plus \$1 shipping and handling
Manufacturer: Comproline, 1949 Evergreen Ave., Fullerton, CA 92635

Requirements: Console, Extended BASIC, memory expansion, disk system, Epson-compatible printer. Any Character Sets and Graphic Design (CSGD) small graphics helpful.

key again. You see a number (1) and the following on the screen: DEL/INS GRAPHIC 12ESDX.

The No. 1 signifies the option you are working on; the next item refers to available editing functions — in this case, deletion and insertion of a graphic. The numbers 1 and 2 refer to the delete and insert keys. The ESDX stands for the arrow keys that position the diagonal corners of a box (cursor) where your graphic is to be deleted or inserted. Each screen option (1-8) contains its own set of guidelines. An

"F" in front of a number represents the function keyboard key. Don't worry about the messages on the screen; they will not appear on your card. As you place the cursor on them, they will vanish.

The following are the remaining seven options (screens) available:

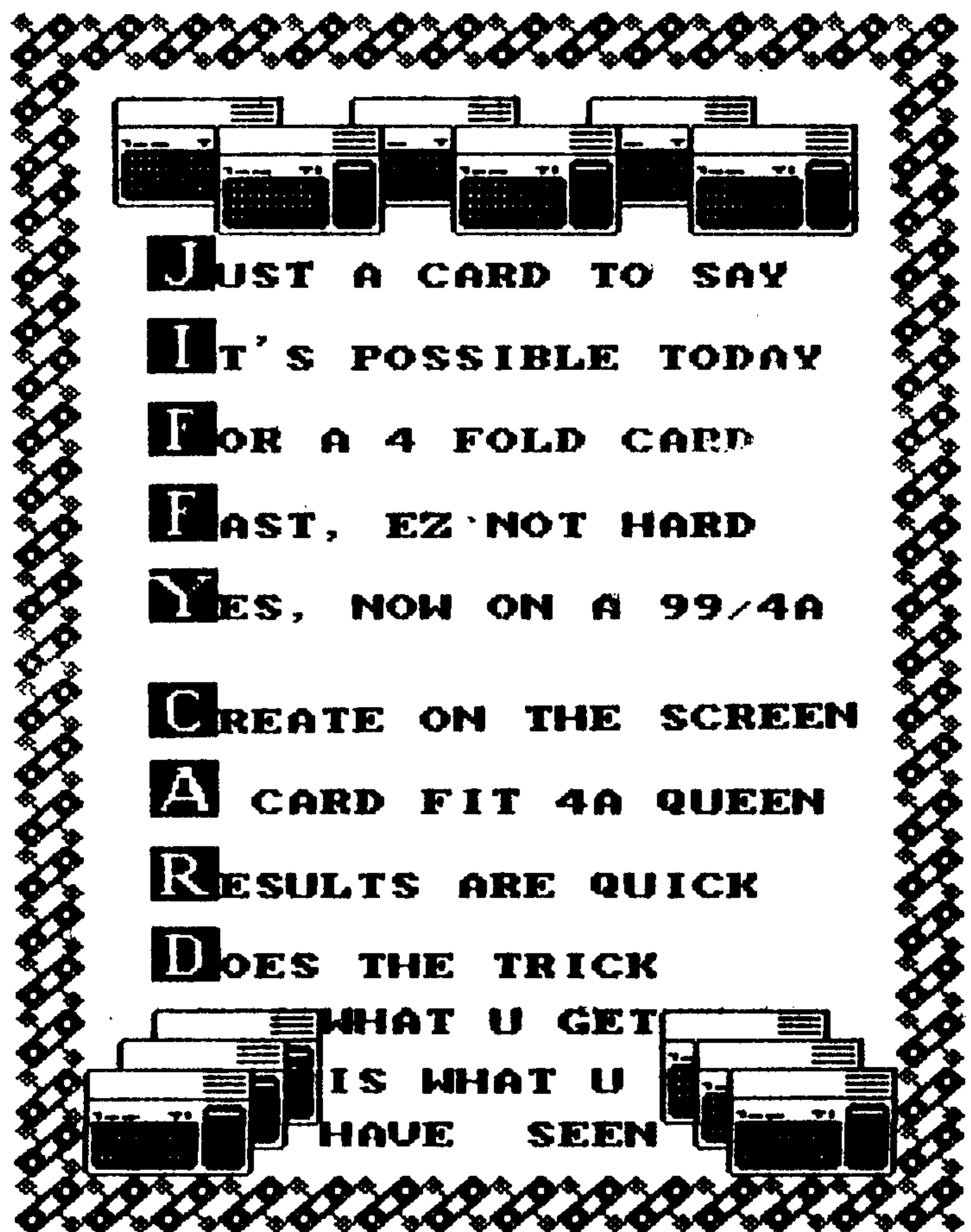
2. CHANGE TITLE — Type Large Font title, or delete title, in two font styles.

3. CHANGE BORDER — Pressing space bar cycles through 45 ready-to-use borders, or pressing Function 2 enables you to enter hex code for your own created border.

4. CHANGE CSGD GRAPHIC — Load a CSGD graphic. Default is "N."

5. ENTER TEXT — Can be used as a general "eraser" of text and/or graphic, and where small font text is entered.

6. CHANGE SMALL FONT — Press space bar and cycle through seven font
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MICRO REVIEWS

Tapemaster, Pix Pro, Star Fleet Technical Drawings II all get four stars

By HARRY BRASHEAR

Ratings of products 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.

★★★★

TAPEMASTER

This little gem gets four stars for NEED, four stars for PROGRAMMING, and four for the THOUGHT. Australia produces some great stuff from time to time, a lot of which we never get to see, but I have friends...so this one didn't get by us.

Since I'm lazy, (and I couldn't say it better myself) I will just quote a lot from the Tapemaster docs. I also want you to know more than my usual abbreviation about the program operation. That way, you'll realize how easy it works and be able to help out a lot of people without a lot of effort.

From the docs: "In the past, when recording a cassette tape full of programs as a master tape or for some other reason, how you would sit at your computer repeatedly OLDing a program from disk, SAVEing to CSI, pressing cassette RECORD then STOP at the appropriate beep, ad infinitum. Well, not any more with Tapemaster.

Now you can mark a directory of disk filenames to indicate which ones you wish to copy, start the cassette in record mode and go off for a cup of coffee. When you hear a series of pips, all you have then to do is to stop the cassette recorder and remove the finished tape. It's a simple matter, with Tapemaster, to run off a tape full of custom programs for a friend with console only, or prepare a master tape for a club tape library.

Tapemaster is written in assembly and comes on disk under two different filenames. It is embedded in an Extended BASIC carrier program called TAPEMASTER which, naturally enough, can be loaded the same as any Extended BASIC

program. The file, TM, is in memory image format suitable for loading with any of the E/A option 5 type loaders. Just enter the floppy drive number from which you want to get a disk directory. Only program type files, (BASIC, Extended BASIC and assembly memory image) will have their filenames listed on the screen, together with the size, (in bytes) and tape recording time. The topmost screen line shows the number of program type files that are on the disk. Twenty filenames can be displayed on the screen at a time, so if there are more than that on the disk, you can page in other screens of filenames with the CTRL/X and CTRL/E key combinations. The cursor can be moved up or down beside the filenames with FCTN/E and FCTN/X keys.

Select filenames for copying by typing a "C" at the cursor or cancel a previous marking by using the space bar. As each file is marked for copying, or unmarked, the status info on the bottom screen line is updated. The status line shows the number of files marked for copying and the total cassette recording time. The figure shown is actually about 2 percent on the low side so it is advisable to leave 2 or 3 minutes spare at the end of a tape. For a 60-minute tape, about 27 or 28 minutes should be the maximum recording time aimed for on each side of the tape.

When you're finished selecting filenames to be copied, press PROCEED (FCTN/6). The next screen shows a few cassette recorder instructions. Because the 99/4A directs its audio output for cassette through both CS1 and CS2 red leads simultaneously, it is possible to record onto two recorders at once. Tapemaster automatically controls the cassette motors, starting and stopping them at the appropriate times.

The program allows you to print out a record of the filenames that you have selected for copying. Most programs saved to tape will be in BASIC or Extended BASIC. Note that an assembly memory image file on tape can only be of use if memory expansion is installed and a

special loader, such as Will McGovern's CASSLOAD, is used to load and run it.

The limitation of the program is its inability to process an oversized program that is stored in INT/VAR format. This type will have to be saved by the OLD DSK1, SAVE CSI method. Note also that some BASIC programs on disk access data files on the same disk. These are not suitable for copying. (NOTE: If you think all that is smart, get a load of the next paragraph!)

We know that the days of the cassette-based system are numbered, just remember that there are many users out there just starting off with such a system and they are the ones that need most assistance. In the Brisbane Users Group we have had lots of inquiries lately from people, many of whom had shelved their TI99/4As some years ago. Some of this response can be attributed to the fact that this group now has a telephone directory listing so worded that it is placed next to Texas Instruments Australia."

If your user group librarian doesn't order this program, you don't deserve group status. Send a five dollar bill, American, airmail to: Col Christensen, 17 Centaur Street, Redcliffe Aust 4020 While you're at it, ask for a description of Col's other programs, he is one heck of a programmer.

★★★★
PIXPRO

Here's a new program from Asgard Software that anybody who works with TI graphics of any kind will want. It's a picture converter that works with all of the major formats — Artist Picture, Artist Instance, Graphx, PagePro, Picasso, and Macintosh format. It will load any one of those and then you may convert the format to any other one, except Mac. By the way if the picture is in color, that goes along for the ride too, where applicable.

It's a down and dirty program, looking for all the world like MAX RLE esthetically, but that's because they needed all the

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MICRO REVIEWS—

(Continued from Page 36)

memory they could get. (Consider how much memory it takes for an 85-sector Picasso file.) The whole program had to be stuffed into 8K, which produced another interesting dilemma. With all of the different formats needing to be changed to all the others, they are all changed to a new format — called Pix — before you can view it. This cuts down on the number of format variations required. If you're a little confused, don't worry about it, it works. It just takes a little longer to view your picture, but this is supposed to be a tool, not a slide show.

One of the best features is the ability to "clip" a part out of any picture. While you're viewing it, press "C", and it turns into an arrow that you move with the arrow keys. When you have the upper left corner of the area you want to clip, press Enter. Now the other corners can be placed wherever you want. Press Enter again and the clip is coded and viewed, and finally converted to the format of choice.

Macintosh pictures are handled with a separate program segment on the disk called McPix. With this program you can convert a Mac file to either PagePro or Pix format, or print it out. When you're working with, or viewing the really BIG Mac pictures, this program is just the ticket. The conversions make a smaller file so the entire picture can be viewed with scrolling, and subsequently clipped in the PixPro section. Also, the picture can be printed from the disk not the VDP, so you will always be able to see the whole thing. The printing options allow for an 8½ x 11 printout or a condensed one.

The bottom line is that this program is a problem solver for the graphically inclined. The only major format it won't handle is Joy Paint, and I think that's a shame, but, maybe later. \$14.95 plus 75 cents shipping to Asgard Software, P.O. Box 10306, Rockville Md, 20850.

★★★★

STARFLEET TECHNICAL DRAWINGS II

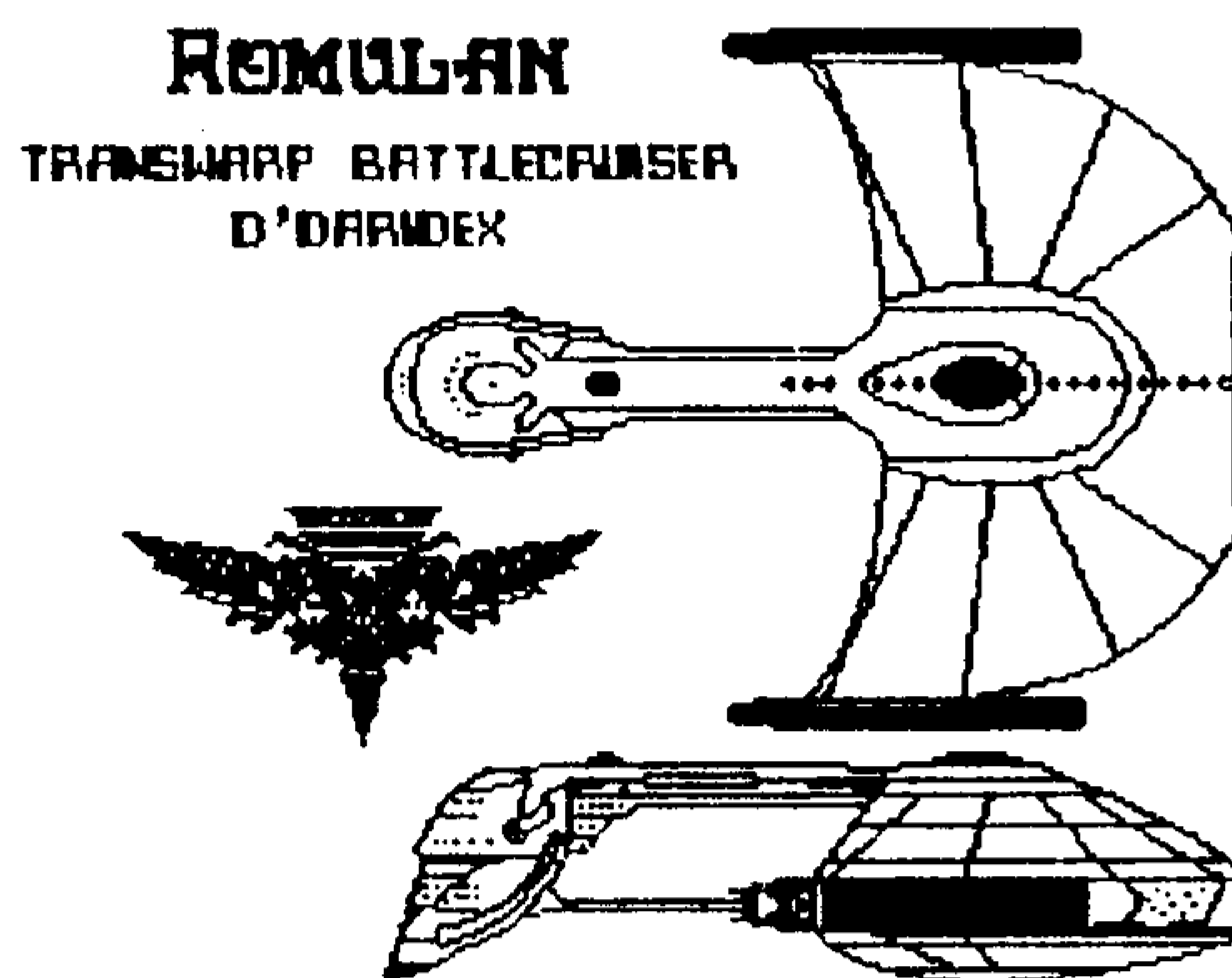
Here we go again, Trekkies, more of the same great artwork that made the first package a best seller. Stephen Barackman,

the author/artist of these packages, continues to astound me with his ability to put these illustrations into perfect scale.

If you've got a printer you can have spaceships galore to line your walls with. (You can REALLY have fun with Comprodine's Poster Printer) They also make great illustrations for newsletters, flyers, and one friend of mine got a real good idea: He printed them out a poster printer and used the results to rough in for a fantasy van painting.

Whether you're a Trekie or not, these packages are great to have handy for banners, logos, or whatever else your imagination can come up with. For \$9.95 plus shipping and handling, they are a super value. There are three disks per set (I and II) with 21 pictures total, plus a DisplayMaster file for viewing on each disk.

Here's a sample illustration:



They're from Texaments, 53 Center Street, Patchogue, NY 11772.

While I'm at it I would also like to mention the great BBS that Texaments supports. The number is 516-475-6463. You can talk to some VIPs there, get info on TI-Base, Artist Plus etc. Give it a try.

UPDATE

I received a letter from Shirley Slicer, compiler of the TI-Comparison Shopper. It seems I messed up the parameters of obtaining her program. She would prefer that you download the TI-CS from a BBS and send her your donation of \$5. For the 80 percent of you who don't have modems though, you can send her a disk and return postage with your \$5, or for an additional

\$3, (\$8 total) she will supply said-same.

Sometimes I get a little sloppy around 3 a.m., but maybe I should set a little fair-ware policy here. If someone asks for donations as small as that, send the disk and SASE, or a little extra to pay for it. It won't do any harm, believe me.

This is my 12th Micro Review, (although it took 14 months to accomplish that). I would really like you to drop me a postcard and tell me how you like it so far, and what if any changes you would like to see. I will send all the favorable ones to my editor, and try and do something about the criticism. Thanks up front.

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

JIFFYCARD —

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styles — press Enter when done.

7. S(ave) L(oad) C(atalog) — Saves a card creation, loads a previously saved creation and catalogs all CSGD/GR graphics from the main program disk or any drive — when the name of the graphic appears between the box borders, select and load your graphic by pressing the Enter key and

8. PRINT YOUR CARD — Before printing your card, turn off your printer. Set the perforation at about the print head, then reactivate your printer. You shouldn't need to adjust the paper for subsequent cards. A card printed in double density prints in 2½ minutes. Up to 99 copies may be printed.

To see what a card looks like on the screen or printed, go to screen option 7. Load one of the card samples provided (Card 1, 2 or 3).

To complete your personal touch, an envelope template is thoughtfully provided.

Multicolor cards are made by using different printer ribbons — or, color the cards.

For those of you who own an NX-1000 Rainbow or an Epson color compatible printer, select your color by choosing a number from 0-6 for black, red blue, violet, yellow, orange or green. If you truly want to use the color capabilities of your

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Newsbytes

99BBS upgrades

The 99BBS has upgraded with a new upload/download section, according to sys-op Roger Davis.

Davis says files uploaded do not have to be transferred to a download disk, but are immediately available to the user. Also, he says, space available to the user for downloads has been expanded by 50 percent.

The new program section reads download catalogs from several disks (transparent to the user), he says, printing only those that applies to the category selected (TI or Geneve). Then the system searches these disks for the requested file name, and begins download.

Davis says uploads and downloads proceed faster than on other systems, because of the transfer blocks being four times bigger than on other systems.

Davis says support for the Geneve is emphasized, with special upload/download sections and special info files.

The 24-hour, seven-day board operates at 300, 1,200 and 2,400 baud at (213) 947-7777 and is reachable through PC Pursuit CALAN, settings 8N1.

Centralized FORTi library proposed

Stephen Findlay is trying to contact as many FORTi card owners as possible. He says this could eventually result in a pooling of music already available into a centralized library to alleviate repetition by programmers and articles dedicated to FORTi music.

Contact Findlay at 117 Spruce St., Aurora, Ontario, Canada L4G 3T5.

Rave 99 upgrades MX01 software

Rave 99 Co. has released its **MX01 Software Upgrade V1.3**.

According to the manufacturer, the keyboard Macro program is now compatible with the RAMdisk and Menu screen programs. The Macro loader may now be selected from the system screens when entering a filename. The Macro program now includes a "Mailbox" feature. The Mailbox is loaded with the last filename ac-

cessed by the Show directory routine. This allows the current filename to be included as part of a keyboard macro.

According to the manufacturer, the Mailbox feature works with all Editor/Assembler type 5 programs and simulate a batch programming environment, so macro strings may be created to perform complex operations.

New directory commands have been added, and modifications to the Rave 99 software have been made to allow proper operation of 80-column cards. Some minor "nuisance" problems remain with 80-column cards, the manufacture notes.

The upgrade is available for \$14.95 plus \$3 shipping and handling. Visa and MasterCard are accepted. Contact Rave 99 Co., 112 Rambling Rd., Vernon, CT 06066, or (203) 871-7824.

Texaments releases Mailing List Manager for TI Base

Texaments has released **Mailing List Manager**, the second database application specifically designed for TI Base, and has entered into an exclusive software distribution agreement with Barry Boone, author of several titles for the Geneve 9640.

Mailing List Manager (MLM), a database application written in the TI Base command language, is described as a complete mailing list management system. With the MLM system, says Steve Lamberti, president of Texaments, any user can add, change, display and print entries in his own personal mailing list. Any function in the fully menu driven MLM can be accessed in a single keystroke, Lamberti says.

Lamberti says MLM, which follows MICROdex as a TI Base application, will be followed by other applications, including an Events Calendar.

Features listed for MLM include two forms of data entry, editing functions, multiple reporting and searching functions, mailing label output, telephone autodialing, disk cataloging, record maintenance functions and file sorting.

Lamberti says although MLM is a database application, it can also be used as an example of how TI Base command files op-

erate. Each command file used in MLM can be viewed using the TI Base editor, he says, and also altered to suit individual needs.

Mailing List Manager is available from Texaments for \$14.95 plus \$2.50 shipping. It requires TI Base V.2.0 or higher. A Hayes (or compatible) modem is required to use the autodialing functions of MLM.

Texaments now has the exclusive right to distribute all Boone's software releases commercially. Boone's titles, **Exec**, **Archiver III**, **GETKEY** and **GETSTR** are available from Texaments in one package called the **Geneve Utility Pak**.

Lamberti says commercial distribution of the programs, formerly offered as freeware, will allow for wider access to the market and better support for users, such as notification on upgrades.

Exec is an MDOS utility designed to simplify loading and running TI99/4A Editor/Assembler option 5 programs. With Exec, users no longer have to load GPL or a cartridge. Instead, most option 5 programs can be loaded directly from MDOS.

Archiver III combines a group of files into a single file, which can occupy less space than the original file when compressed. With Archiver, groups of related files can be stored together and extracted when needed, saving disk space and allowing easier organization of disk libraries, according to the manufacturer. Archiver III works with both the Geneve 9640 and TI99/4A.

GETKEY and GETSTR are short external MDOS commands used from within batch files to create interactive batch files.

The Geneve Utility Pak is available from Texaments for \$17.95 (plus \$2.50 shipping).

Contact Texaments at 53 Center St., Patchogue, NY 11772 or (516) 475-3480 (voice) or (516) 475-6463 (BBS).

Comprodine releases new products

Comprodine has released seven new products recently. All require a single disk drive, 32K memory and Extended BASIC.

Color Card and **Color Flyer** are available for Epson/Star color printer owners.

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While these programs are nearly the same as Jiffy Card and Jiffy Flyer 3.0, the user can view and change the colors of the large font, small font, graphics border and block character to achieve five-color output, the manufacturer says. Each page of the card is independent of the others. The packages are complete with all graphics included, but others are available since it uses CSGD/GR graphics. All graphic placement except borders is in the users' control. The programs, written by Rodger Merritt, are enhanced by a color printing routine by Adrian Robinson that is said to produce a double-density finished product in four minutes on a Star XR-1000. The Card programs come with an envelope template.

Color Card sells for \$25 plus \$1 shipping and handling, and Color Flyer for \$20 plus \$1 shipping and handling. Non-color versions are each \$10 less.

Living Tomb and **War Zone** are 100 percent assembly language games by Quinton Tormanon. Both programs have a self-running demo mode until the user begins play.

Living Tomb is a 3D Dungeons and Dragons inspired adventure game including graphics, sound, animation, optional speech and intricate scorekeeping. It uses overlaid pop-up windows to check weapons, armor, treasures and inventory, as well as other options such as customize or search, and is all joystick controlled. According to the manufacturer, "you could move through this full screen underground maze at the rate of 10 rooms a second but you had better not because of the demons, traps and hidden rooms that are around every corner." Even in death a player attains a score and the top high scores are saved to disk.

War Zone is described as a fast arcade game with an ever-increasing level of difficulty, dictated by new screens, increased numbers, speed, weapons and terrain. A user can continue up the levels after being killed (score is reset). According to the manufacturer, getting experience at the higher levels makes the lower levels easier when the user restarts there. The top five scores of the day are kept, while the top 10 all-time scores are saved to disk.

Living Tomb is \$15 plus \$1 shipping and handling, and War Zone is \$10 plus \$1 ship-

ping and handling.

Artist Print Shop by Paul Coleman is a companion to TI-Artist. Using simple menus at assembly language speed this package of three printing functions uses all fonts and instances without modification or conversion, according to the manufacturer. Single or double-density output on any Epson compatible printer is said to be possible with this program, and all instance options allow mirroring the image. The program is designed to calculate and perform all layout, spacing and centering. If font characters are saved proportionately, they will be printed that way, as all text input is based on dot calculations, the manufacturer says.

The user can create and print a custom letterhead with two instances, one line of any large font and three lines of one char high font with a bottom line in five minutes, the manufacturer says; a five-foot banner, using any font, bookended if desired by two instances, would take 10 minutes. The manufacturer says one has the option of the size of both as maximum magnification to fit on the page is given; one may then choose auto centering or tabbing, which would allow one to put several lines of text across the banner. One may also choose solid or block (white space around small blocks).

The program allows loading up to five any size instances and one any size font and one 1 high char font. Graphics and text can be laid out anywhere, the manufacturer says, with both fonts and instances either regular size or magnified. (E.g. a 5 high font could be 10 char high and a 24 char high instance could be 48, or a half page, high.) The five graphics can be used more than once on a page. A scan feature allows the user to view and change the pages, and the user may choose from 13 borders.

The three-disk collection and manual is \$25 plus \$1.50 shipping and handling.

To order send check or money order (outside U.S., International Money Order and add \$2) to Comproline, 1949 Evergreen Ave., Fullerton, CA 92635.

Mailbox BBS on line

The **MailBox BBS** in New Castle, Pennsylvania, is running on a TI99/4A compu-

ter expanded to about 45Meg, using a mix of 40/80 track floppies, a hard drive and a RAMdisk, according to Jeff Bishop of New Castle.

The board uses the Texlink BBS software from the Ottawa Users Group. Bishop says the MailBox runs as a service for TI99/4A users, though it welcomes others and supports them in the download areas.

Though callers who can enter the XBASIC module number can enjoy complete access, users are still requested to register with the sysop. The 24-hour board runs at (412) 654-8268 at 300, 1,200 and 2,400 baud.

Spring conference set by Lima group

The Lima Ohio User Group is scheduled to sponsor a TI Multi User Group Conference from 9 a.m. to 6 p.m. May 26 in Reed Hall/Student Activities Building of the Ohio State University Lima Campus.

For information phone Dave Szippel evenings at (419) 228-7109 or write the group at P.O. Box 647, Venedocia, OH 45894.

Asgard releases 100th product

Asgard Software has released its 100th product and 65th title, according to Chris Bobbitt of Asgard. The new product is the diskette version of **Doom Games III**, a collection of new games by Ken Gilliland for the Tunnels of Doom module.

Bobbitt says Asgard has begun manufacturing its own modules, making it the first new original equipment manufacturer of modules for the TI99/4A for more than four years. DataBioTics previously manufactured Asgard's modules.

Bobbitt says the PC board in the Asgard module includes a capacitor and a resistor and is designed to fit within standard module cases. He says the nickel-plated edge connectors are built to TI standards, and the modules use TI EPROMS.

Cartridges available are **Typewriter 99** and **Tris**, both by Jim Reiss. Tris is available on disk for the Geneve 9640.

Bobbitt says the company is seeking assembly language programmers interested
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in adapting their software for modules, or in writing new items specifically for the cartridge market.

Pix Pro is a new disk-based picture conversion program by Asgard for the 99/4A and Geneve 9640 which is said to allow the user to load pictures stored in Picasso, GRAPHX, TI-Artist Picture, TI-Artist Instance, Page Pro, MacPaint, RLE or Pix formats and save them as GRAPHX, TI-Artist Picture, TI-Artist Instance, Picasso, Page Pro or Pix pictures.

Pix Pro requires 32K, one disk drive, and either Extended BASIC, Editor/Assembler or TI-Writer. An Epson or compatible printer is required for printing.

Pix Pro sells for \$14.95. Add \$1 shipping to order directly from Asgard.

To order, for a catalog, or for more information, write Asgard Software, P.O. Box 10306, Rockville, MD 20849 or call (703) 255-3085.

Plink sign-up info

Sign-up information was omitted in last month's article on People/Link (Plink).

Voice numbers are 1-800-524-0100 (outside Illinois) and (312) 870-5200 (Illinois only). Modem numbers are 1-800-826-8855 (outside Illinois) and (312) 822-9712 (Illinois only). Address is American People/Link, 3215 North Frontage Rd., Ste. 1505, Arlington Heights, IL 60004.

GENie access extends to cities in Canada

General Electric Canada Inc. has announced expanded GENie service access to 166 cities in Canada via Telecom Canada's iNet 2000 gateway service.

Offered to GE Canada by GE Information Services in Rockville, Maryland, GENie is an online consumer information service.

GENie has previously been available in Canada in Montreal, Quebec; Toronto, Ontario; Calgary, Alberta; and Vancouver, British Columbia. In these cities, it can be accessed via GE Canada at the basic GENie service access rate.

The following are cities which can access GENie via iNet:

Alberta: Airdrie, Banff, Calgary, Edmonton, Fort McMurray, Fort Saskatchewan, Grand Prairie, Leduc, Lethbridge, Lloydminster, Medicine Hat, Peace River, Red Deer, St. Albert, Sherwood Park and Stoney Plain.

British Columbia: Abbotsford, Campbell River, Cranbrook, Dawson Creek, Kamloops, Kelowna, Nanaimo, Nelson, Penticton, Port Alberni, Powell River, Prince George, Prince Rupert, Terrace, Vancouver, Vernon, Victoria, Westview and Williams Lake.

Labrador: Happy Valley/Goose Bay.

Manitoba: Brandon, Dauphin, Flin Flon, Morden, Portage La Prairie, Selkirk, Steinbach, Thompson and Winnipeg.

New Brunswick: Bathurst, Campbellton, Edmundston, Fredericton, Moncton, Newcastle, Saint John and Woodstock.

Newfoundland: Carbonear/Harbour Grace, Clarenville, Corner Brook, Gander, Grand Falls, Marystown-Burin, St. John's and Stephenville.

Northwest Territories: Cambridge Bay, Fort Simpson, Fort Smith, Hay River, Inuvik and Yellowknife.

Nova Scotia: Amherst, Bridgewater, Halifax, Kentville, New Glasgow, Sydney, Truro and Yarmouth.

Ontario: Ajax-Pickering, Aurora, Barrie, Belleville, Bolton, Brampton, Brantford, Brockville, Chalk River, Chatham, Clarkson, Collingwood, Cornwall, Fort Erie, Galt, Guelph, Hamilton, Huntsville, Kingston, Kitchener-Waterloo, London, Markham, Newmarket, Niagara Falls, North Bay, Orillia, Oshawa, Ottawa, Owen Sound, Pembroke, Perth, Peterborough, Renfrew, St. Catharines, St-Thomas, Sarnia, Sault Ste. Marie, Simcoe, Smiths Falls, Stratford, Sudbury, Thunder Bay, Toronto, Trenton, Welland, Whitby, Windsor and Woodstock.

Prince Edward Island: Charlottetown and Summerside.

Quebec: Alma, Baie-Comeau, Chateaugay, Drummondville, Gaspé, Granby, Hauterive, Joliette, Jonquiere/Chicoutimi, Montreal, New Carlisle, Quebec City, Rimouski, Riviere Du Loup, Rouyn/Noranda, St-Bruno, St-Eustache, Ste. Hyacinthe, St. George DeBeauce, St. Jean, St. Jerome, St-Sauveur, Sept-Iles, Sherbrooke, Sorel, Ste. Agathe, Thetford Mines, Trois Rivières, Valleyfield, Val D'Or and Victoriaville.

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To access GENie via iNet, there is a \$4.95 (Canadian) per hour charge from the local telephone companies on behalf of Telecom Canada in addition to the basic GENie service connect time rates charged by GE Canada.

Basic rates (all prices quoted are Canadian funds) for GENie during non-prime time are \$7 per hour for 300 baud, \$9 per hour for 1,200 baud and \$15 per hour for 2,400 baud. Non-prime rates are 6 p.m. to 8 a.m. local time Monday through Friday and all day on weekends and national holidays. Sign-up fee in Canada is \$39.95, which includes a \$15 usage credit, a manual and a subscription to GENie's *LiveWire* magazine.

For information on GENie access via

iNet 2000, call 1-800-267-8480 in Canada, or (613) 781-5128. For information on signing up for service through GE Canada, call 1-800-638-9636.

1990 TICOFF slated

The fifth annual TI Computer Owners' Fun Festival (TICOFF) is scheduled from 9 a.m. to 4 p.m. March 17 at Roselle Park High School in Roselle Park, New Jersey.

Proceeds from the event go to the Roselle Park High School Student Council Scholarship fund. Last year's TICOFF had a paid attendance of 925 and raised \$4,000 for the scholarship fund, according to Bob Guellnitz, coordinator of the event.

Tickets are \$5 and each holder of pre-paid admission will receive a free disk of software, Guellnitz says.

Guellnitz says user groups who apply before Feb. 15 will be given a free display table at TICOFF. Tables will be available to user groups at vendor rates after that date. Staff at free tables must pay admission to TICOFF.

Each user group president or his designated substitute will receive a free ticket to a President's Luncheon to be held during TICOFF. Luncheon host will be Art Byers, president of the Central Westchester 99ers of Westchester, New York.

Speakers and seminars are scheduled for the event, including Lou Phillips of Myarc.

Vendor tables are \$50, first table; \$35, second table; and \$25 per table, additional tables.

For information, write TICOFF, Roselle Park High School, 185 West Webster Ave., Roselle Park, NJ 07204 or call Guellnitz at (201) 241-4550, Ext. 244. After 6 p.m., call Guellnitz at (201) 382-5963 or Byers at (914) 528-5402. Or, call the 24-hour TICOFF BBS at (201) 241-8902 (300/1,200 baud).

Newsbytes is a column of general information for TI and Geneve users. Information from manufacturers, authors, distributors etc. is welcome. Illustrations and photographs will be used when space permits. Send items to MICROpendium, Newsbytes, P.O. Box 1343, Round Rock, TX 78680.

User Notes

Why partition a hard disk?

Partitioning a hard disk, which is an option when you format it, is done for several reasons. Basically, by partitioning, you are creating two or more hard disks, each addressed by different letters — C and D, for example.

A user who partitions a 20-megabyte into two equal parts essentially will have created two 10-megabyte drives. So why not buy two 10-megabyte drives instead?

Simple. Ten-megabyte drives are hard to find and cost about as much as a 20-megabyte drive. But why partition in the first place?

A couple of reasons. A user may want to put all his programs in one partition and all his data in another. Or a user may have a large database and wants to keep his database files separate from his other programs. It is basically an organization tactic.

Another reason is that if you have a problem in one partition, it may not spread to the other. Suppose partition "C" suddenly loses its boot record, or suffers data loss because of a power failure or some other cause. Much of the data on the "C" drive could be lost as a result. But data on the "D" drive would most likely be unaffected. Of course, a general failure of the drive, such as the motor burning out or the heads crashing would probably damage both partitions.

The process of partitioning is done under the control of MDM5 at the time the hard drive is formatted. The HFDC manual outlines the procedure so that users should

have little trouble in turning that one hard disk drive into two.

Addendum to expanding RAMdisk

This comes from Gary Bishop of Marion, Iowa. Bishop wrote an article about expanding Horizon RAMdisks from 192K to 256K that appeared in the Sept. 1989 MICROpendium. He writes:

In my article I neglected to mention about the wiring of two pull-up resistors. A 10K, one-quarter or one-eighth watt resistor needs to be installed between pins 20 and 28 on each of the added RAM chips, the ones I called UI1T and UI7T.

The best way to mount these is to solder them directly onto the pins at each chip, using sleeving on the resistor leads as necessary to prevent shorts to other pins. The addition of the resistors will prevent excessive current consumption by the added chips from the batteries when the PEB is not powered. Also, they will help prevent unexplained losses of data from these new chips.

Corrections to XB-TIA Instance conversion

This comes from Frank Geitzler, of Dartmouth, Nova Scotia. He writes:

I recently had occasion to compare the listing of the program printed in the November 1988 issue of MICROpendium with the program I received from the author of the program, Terry Atkinson. Three differences in the MICROpendium listing would seem to prevent the program

from working as intended. Changes required are to lines 9, 10 and 13. Here is the code:

```
9 B$="123456789ABCDEF" :: OP
EN #1:OUT$
10 PRINT #1:STR$(ECOL-SOOL+1)
)&","&STR$(EROW-SROW+1):: FO
R F=SROW TO EROW :: FOR G=SC
OL TO ECOL :: CALL GCHAR(F,G
,H):: IF H>32 THEN I=H ELSE
I=95
13 FOR E=1 TO 15 STEP 2 :: D
$=SEG$(C$,E,2):: E$=E$&STR$(
POS(B$,SEG$(D$,1,1),1)*16+PO
S(B$,SEG$(D$,2,1),1))&"," ::
NEXT E
```

Mention should also be made of the fact that the output disk filename should be limited to eight characters following the "DSKn." specification, as the program automatically adds "-I" to the end of the output file.

How to load TIA+ from a HRD

This comes from James P. Cavanaugh, of Eggertsville, New York. He writes:

After purchasing the new TI-Artist Plus!, I was frustrated that it wouldn't load in my expanded system. Visiting other members of our Western New York 99ers Users Group, it would load in only one of the six systems we tried it on. That one was the only one that did not contain a Horizon RAMdisk.

When I removed the HRD from my system, the program would load. No one had an explanation!

I found the bug.

The @NEWPATH file is configured for "DSK*". I reconfigured it to read "DSKI" (don't use the quote marks if you reconfigure your TIA+). The program now loads as intended, with the HRD in the system. I suspect the asterisk conflicts with the MENU program in the HRD, which also accepts the asterisk.

SEB Fctn-Shft mod for 9640 and 4A

This comes from Tom Freeman of the Los Angeles 99ers User Group. He writes:

(See Page 42)

JIFFYCARD—

(Continued from Page 37)

TI and your color printer, a separate program, "Color Card," is available. It is a mirror of Jiffycard, except that one may change the color of the border, graphic, small font, large font, and block character. Because of the special color screen dump developed by Adrian Robinson, the program sells for a little more — \$25 plus \$1 shipping and handling. Colorflyer costs \$20 plus \$1 shipping and handling.

Conclusion: No comparable card-making program on the market offers all the options of Jiffycard. Jiffycard would make an excellent addition to any other desktop publishing program you may own, and, as usual with Comrodine products, the price is exceptional. Rodger Merritt not only does an outstanding job of programming, he seems to know what the TI community needs, and fills the need.

User Notes

(Continued from Page 41)

Many of you are now using the marvelous Super Extended BASIC module (code by Doug Warren, Danny Michaels, Mike Dodd, et al) which has been reviewed here and in other publications. For me the best feature was the improved editing keys, over TI Extended BASIC, since I still do a lot of work in XBASIC.

Unfortunately, when I transferred the module to my Geneve, which I use exclusively, the four editing keys which require pressing FCTN and SHIFT keys simultaneously with one of the arrow keys would not work at all. This was because the normal keyscan in the 99/4A operating system cannot detect the simultaneous press of the FCTN and SHIFT keys. Instead the code in the module first detected the FCTN and arrow keys, then checked independently via a direct scan of the CRU bits for the presence of the SHIFT key. This cannot be done in the Geneve because the keyboard is different and is not scanned via CRU bits. What follows is a method of changing this if you have a GRAM Kracker-type file for the module. Even those who don't have a Geneve may wish to do this modification to eliminate the 3 key presses.

Let me warn all my readers right at the outset. It is not moral or legal for you to make these modifications unless you OWN the Super Extended BASIC module. I know there are some out there who have a GRAM Kracker version obtained from someone else. This is to be discouraged and condemned!

Now that I have that off my chest, here is what you will have to do:

First load the SEB module into the GRAM Kracker, then with the loader switch ON (#5 switch UP) choose GRAM Kracker on the main menu, then #5 Edit Memory from the GK menu. Just to review quickly the key presses you need: FCTN 1 will change the memory window to different types of memory (one press to get GRAM). The arrow keys will move you around the various input areas at the top of the screen, or, if you press FCTN 9, around the memory window for actual editing of memory. When I mention a memory address, you should type that in over the 4 numbers in the upper left hand corner of the screen (just after the little letter, which should be a "g" at this point). Remember that when you actually type in changes the W/P switch (#4) should be either up or down, not in center — but also remember to restore the write proect when you are finished.

At address 6B2A type the following: (in this and the next line please note that only the 4th, 5th, 9th, and 10th bytes in each group of 10 are actually changed)

D6 75 08 6C E7 D6 75 09 6C E3

At address 6BB3 type:

D6 75 0B 6B C2 D6 75 0A 6B C2

At 6AD7 type:

05 77 96

At 7796 type:

D6 75 91 57 A0 BD 61 20 4C E7 D6 75

8 2A 06 77 E7 4C 61 4A

A8 A3 61 00 20 4A A8 D6 75 98

A3 61 00 20 C9 2A 61 6A

20 4A A8 06

DB E1 6B D0 05 6A DC

05 6A DC

The above code translates into GPL op code as follows:

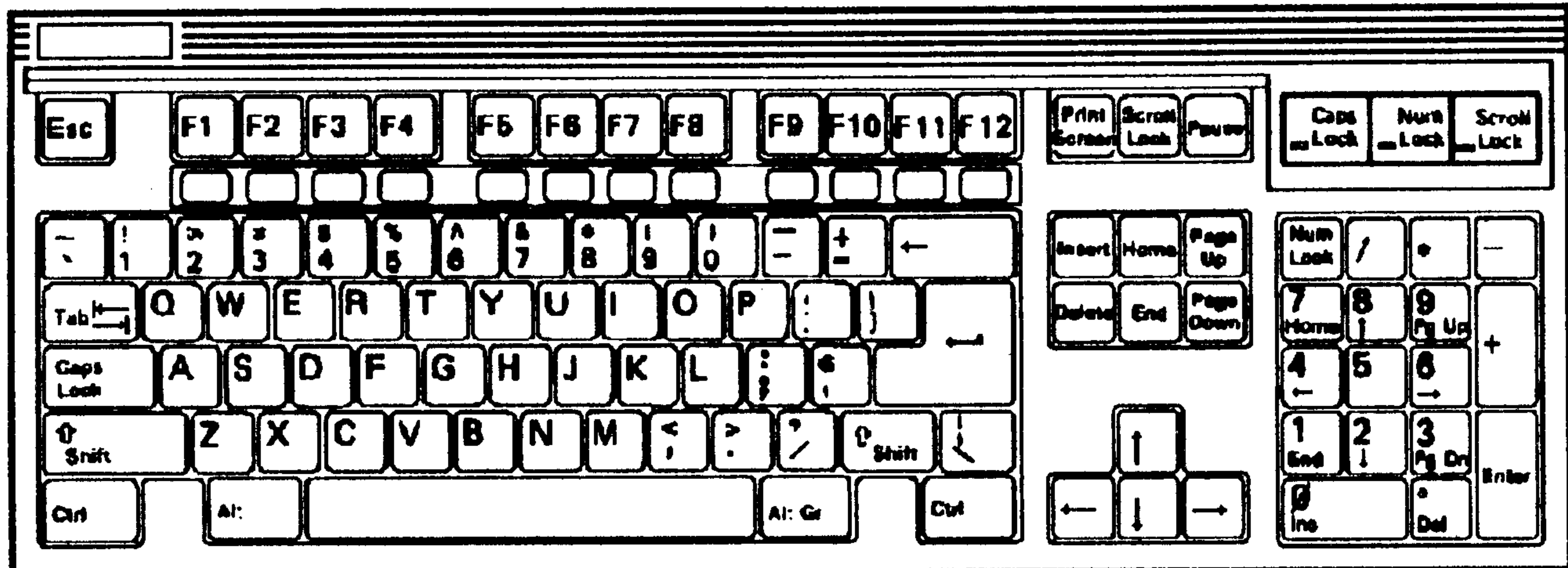
6B2A	C S	>6CE7	Yes, process
	CEQ	>9,@@KEY	FCTN D?
	BS	>6CE3	Yes
6BB3	CEQ	>B,@@KEY	Up arrow?
	BS	>6BC2	Yes
	CEQ	>A,@@KEY	Down arrow?
	BS	>6BC2	Yes
* The above lines originally branched somewhere into the			
* routine at 7796 where the shift key would be checked			
* first.			
6AD7	B	>7796	Go check new CTRL keys
* This address originally contained a call to the rou-			
* tine in GROM 6 which checks for CTRL W,S,D,Z, and C			
* The following section is basically the same as in the			
* module, with changes made so as not to try to detect			
* the SHIFT key			
7796	CEQ	>91,@@KEY	CTRL Q?
	BR	CTRLA	No, check more
	DST	@@>8320,@@>8361	Force cursor to start
*			
	BR	>6CE7	Now process like FCTN S
CTRLA	CEQ	>81,@@KEY	CTRL A?
	BR	CTRLE	No, check more
	DST	@@>832A,@@>8361	Force cursor to end
	CALL	>77E7	A routine to check spaces
	BR	>6CE3	Process like FCTN D
CTRLE	CEQ	>85,@@KEY	CTRL E?
	BR	CTRLX	No, check more
	DSUB	32,@@>8361	Up one line
	DCH	@@>8361,@@>8320	Check range
	BR	>6AA8	OK, go on
	DADD	32,@@>8361	No, redo
	BR	>6AA8	And continue
CTRLX	CEQ	>98,@@KEY	CTRL X?
	BR	>MORE	No, check more
	DADD	32,@@>8361	Next line
	DCH	@@>8361,@@>832A	Check range
	BS	>6AA8	Ok, continue
	DSUB	32,@@>8361	No, redo
	BR	>6AA8	Now, go on
MORE	CALL	>DBE1	Here is the routine for
*			
	BS	>6BD0	the other CTRL keys
* The CALL to DBE1 returns with condition bit set for			
* key press over >31 and the above instruction then			
* branches away from the check for arrow keys - that			
* is why I had to check my CTRL keys first.			
	B	>6ADC	This is where the CALL
*			
originally returned.			

(See Page 44)

Look Whats New at RAVE 99

Introducing - Model XT/101 Keyboard Enhancement - \$224.95

The New RAVE 99 Keyboard Enhancement allows you to connect an IBM style keyboard to your TI-99/4A! The full size keyboard eliminates the awful contortions required when using the original keyboard. This system includes both the Interface Card and our Model XT/101 Keyboard shown below. Get full-featured key layout with 101 keys, dedicated numeric keypad with numeric operators PLUS these additional great features:



- 0 Interface Logic Card Installs easily in console without soldering. A screwdriver is all that is required.
- 0 101 Key IBM Style Enhanced Keyboard with 12 functions keys across the top. Same as the TI-99/4A.
- 0 Supports single key entry of most TI-Writer, Multiplan, and Editor/Assembler commands.
- 0 Attractive low profile keyboard with adjustable tilt angle and 5 foot coiled cord.
- 0 Dedicated numeric keypad with numeric operators (+ - / *) and separate ENTER key.
- 0 Four dedicated cursor keys, page-up and page-down, and home provide complete cursor control with a single keystroke.
- 0 Enlarged RETURN, SHIFT, and CONTROL keys.
- 0 Switchable locations for CAPS LOCK and LEFT CTRL key allows for personal preference.
- 0 CAPS LOCK, NUM LOCK, and Scroll LOCK LED Indicators provide immediate keyboard status.
- 0 Keyboard is XT/AT switchable which allows operation with the TI-99/4A(XT mode) or with an IBM style computer system (AT mode).

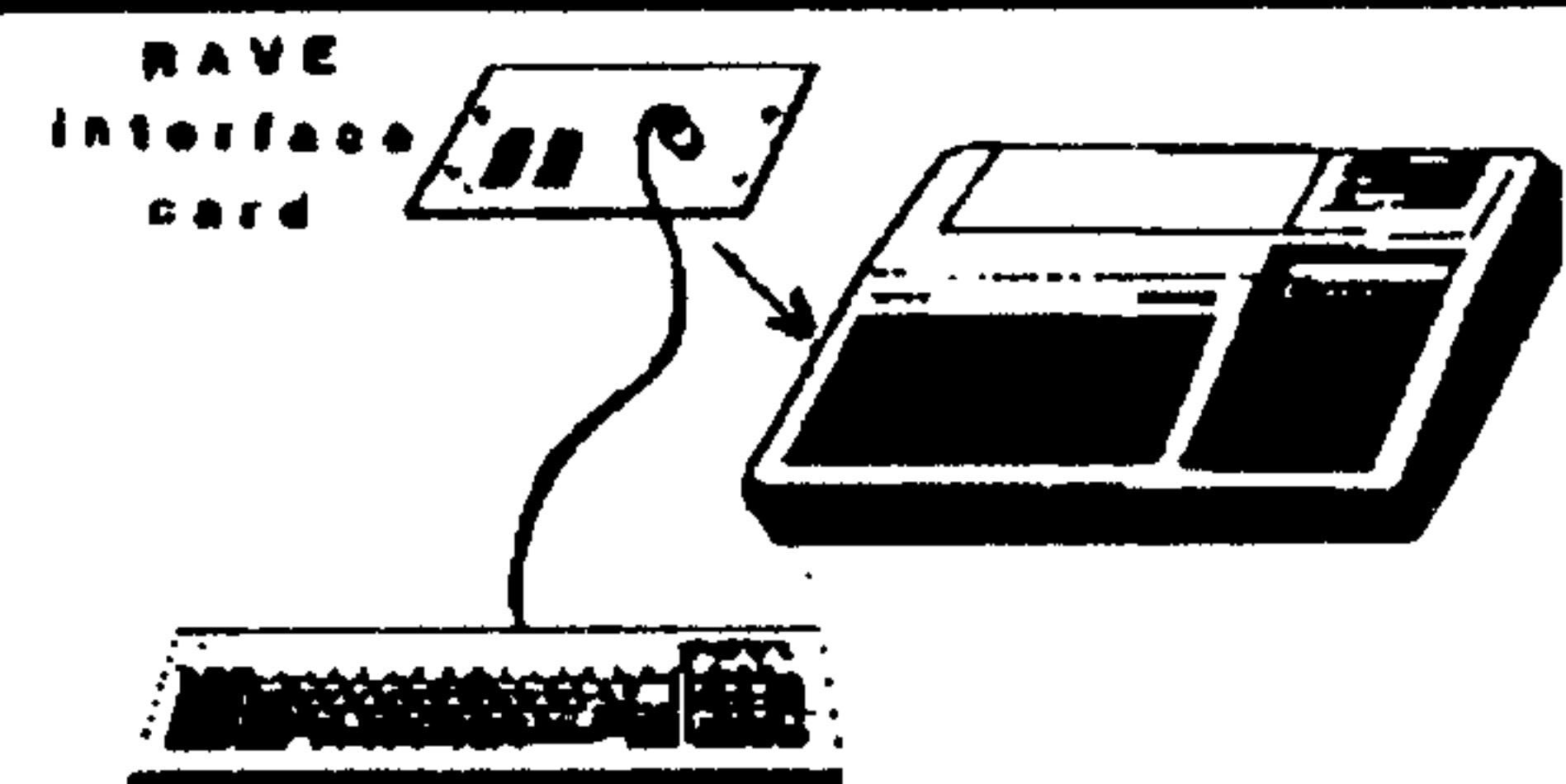
Model 99XT Interface Card - \$149.95

The Interface card install in your 4A console in place of your old keyboard and allows use of any IBM PC/XT compatible keyboard with your 99/4A computer. The interface card supports all 83 standard PC/XT keycodes. Comes with complete, easy to follow installation and operating instructions. NO SOLDERING Required. Optional user installed RESET and LOAD INTERRUPT capability from keyboard.

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Includes printed circuit board, complete instruction manual, and RAVE 99 custom chips. Hard to find hardware is also included. Requires only assembly and about \$10.00 in easy to find components to complete.

EASY INSTALLATION



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The RAVE 99 MX01 memory enhancement system allows memory expansion for the TI-99/4A up to 544k bytes of backed-up memory. Up to four memory cards may be installed in the PEB which allows access to over 2 MEGABYTES of backed-up memory. The card has 2 - 8K byte DSR's, 1- 8K byte Non-DSR, and 8K bytes in the cartridge memory space. Three programs are included for the holidays, at a savings of \$45.00, which allows the card to be used as a RAMDISK, our RAVE_OS which provides a USER FRIENDLY method for Loading, Viewing, Deleting, Printing and Cataloging files. Also, our Keyboard MACRO program is included which allows single key presses to perform complex operations that you would normally type on the keyboard.

MX01/288 - Same as MX01/64 with 256K main memory \$349.95, MX01/544 - Same as MX01/64 with 512 K main memory \$489.95

Speech Synthesizer Adapter Card - \$49.95

Finally a low cost method to move your TI-Speech synthesizer from the side of the console to the Peripheral Expansion Box (PEB). Compatible with the 99/4A and 9640 GENEVE computers. MAKE SOMEONE HAPPY, Put a "VOICE" back in the computer!!

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User Notes

(Continued from Page 42)

When you have made all the changes, be sure to save the module to disk — then test it out. You should now be able to use CTRL E,X,Q, and A instead of FCTN-SHIFT E,X,S, and D, respectively.

Please note that the extra function keys present in the Rave 99 keyboard are not present in the usual keyboards used with the Geneve, so if you want a module compatible with the Geneve do not use function keys higher than F10 or F12. I personally find use of the control plus another key easy enough.

You might want to change the actual key presses to values compatible with MY-Word. CTRL C would be replaced by CTRL K, CTRL A by CTRL Z (which would necessitate replacing CTRL Z with another key, of your choice). Just find the appropriate locations in this article or in James' note, and use the following equivalents: CTRL A to CTRL O are >81 to >8F, and CTRL P to CTRL Z are >90 to >9A.

If you do not wish to use the GRAM Kracker to make the changes, you can make them directly on the disk files (backup, of course). My changes will be on the last of the six disk files that comprise SXB.

Address	Sector	Byte
6B2A	12	48 (>30)
6BB3	12	185 (>B9)
6AD7	11	221 (>DD)

THE INTERFACE STANDARD & DESIGN GUIDE

Covers both hardware and software for peripherals, including:

- * PE Box signals
- * PE Box card dimensions
- * Typical chips & circuits
- * Card electronic features
- * DSR architecture
- * Decoded console routines
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Available from:

Tony Lewis
409 Drolmond Dr.
Raleigh, NC 27615

Write for more info, and vendor list.

7796 24 156 (>9C)

The addresses that James notes for the original CTRL key presses are located in the 28th sector of the third of six files. Add six to the second byte of each word in his list (>E3 etc) to find the byte on the sector.

Use FLEXILABEL for those label jobs

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

In the past, most of my videotape labeling has consisted of pencil entries on the slip case. A recent visit by my grandchildren resulted in a stack of unmarked video cassettes piled alongside a stack of empty slip cases. They seem to have devised a new game called video roulette.

The only way to restore any semblance of order was to skim through each tape to identify the contents and match it with its slip case. Determined not to repeat this chore after subsequent visits, I decided to do what should have been done in the first place. Label the cassette as well as the case. 20/20 Hindsight!

Mailing labels are an exact fit on the side of the video cassette. Often 6 lines of text are needed for a 6-hour tape with six different programs. Rather than use an existing program, such as Disk Label, I decided to write a more flexible program which could handle Video Cassette labels as well as other types of labels. FLEXI LABEL's distinguishing feature is providing the user with the option to print up to 10 lines of text per label. Great for those video cassettes chock full of programs.

When first booted, you are asked to input the number of lines of text to be printed on the label. Include any lines which will be blank. The font used is expanded compressed which enables an easily readable 28 character line. For labels with more than 7 lines, the font automatically changes to superscript. You are prompted to input the text for each line. Just press enter for any line you want to leave blank.

At any time during text entry you can change the number of label lines by entering FCTN C; think FUNCTION C(hange). It can be entered anywhere in a line of text or by itself. The lines you have entered will not be lost, they always default to the next

label. FCTN 3 can be used to erase unwanted lines. All editing keys are functional. If you want to redo a label, just enter zero for the quantity to be printed.

Text entry is automatically limited to 28 characters. Text can be carried over from label to label without re-entry, handy for those labels requiring only minor changes. Any line can be indented by entering spaces at the beginning of the line.

I think you'll find the program as user friendly as they get. This Tiny Gram should answer most of your labeling requirements, whether they be video cassettes, return address, meeting notices publicizing your User Group, "Property Of" labels, or simple mailing labels. Its small size makes it a candidate for your Funnelweb utility disk.

```

1 ! ***** FLEXI LABEL *****
  *   A Tiny Gram   *
  *   By Ed Machonis   *
  **QB-99ers, Bayside NY**
  !139
2 OPEN #1:"PIO.LF" !192
3 DISPLAY AT(8,1)ERASE ALL:"
  LINES OF TEXT/LABEL?(MAX 10)
  " :: ACCEPT AT(9,26)VALIDATE
  (DIGIT):S :: IF S>10 THEN 3
  !193
4 E$=CHR$(27):: PRINT #1:E$&
  "@"&E$&"G"&E$&"W1"&CHR$(15)&
  E$&"C"&CHR$(0)&CHR$(1)&E$&"3
  "&CHR$(216/(S+1)):: IF S>7 T
  HEN PRINT #1:E$&"S0" !138
5 DISPLAY AT(1,1)ERASE ALL:"
  ENTER """" TO CHANGE #/LINE
  S" :: FOR J=1 TO S :: DISPLA
  Y AT(J*2,3):"ENTER LINE";J:L
  $(J):: ACCEPT AT(J*2+1,1)SIZ
  E(-28):L$(J):: IF POS(L$(J),
  """,1)THEN 3 !214
6 NEXT J :: DISPLAY AT(23,1)
  :"HOW MANY LABELS?" :: ACCEP
  T AT(23,18):Q :: FOR K=1 TO
  Q :: FOR L=1 TO S :: PRINT #
  1:" ";L$(L);CHR$(10):: NEXT
  L :: PRINT #1:CHR$(12):: NEX
  T K :: GOTO 5 !109

```

An addendum to the Portable TI

This comes from Jan Janowski of the Chicago TI User Group. His series about (See Page 45)

User Notes

(Continued from Page 44)

building a portable TI appeared this summer in MICROpendium. He writes:

A couple of things:

First, since a slightly different version of the article, "The Making of a Portable TI," ran in the Chicago user's group newsletter earlier this year, the many people who sent me disks for copies of the article received the article submitted to MICROpendium, which was much clearer, and contained more information.

I had a failure on the portable RAMdisk, which was traced to two wires shorted together, and in fixing it, I found out that the IC numbers I used for the memory chips were not the same number that Horizon used when developing the RAMdisk. I am truly sorry, as I tried to make everything as transparent to existing software as possible. Since I was happy with my numbering scheme, I modified ever so slightly the program MEGTEST to incorporate the numbering scheme in the Portable — very simple and about at my limit of programming knowledge. The patched programs are called P-TEST and P-TEST/032.

Anyone who wants a copy of the articles concerning the portable, and modifications to the portable, may send a SASE with disks and adequate postage to: Jan Janowski; 8536 N. Keystone; Skokie, IL 60076.

Any information I uncover or receive is for the TI community, and if I receive or discover anything else I will forward it to others.

Help with joystick port errors given

The following information, by the late John Guion, originally appeared in the newsletter of the Dallas TI User Group:

The TI99/4A supports two eight-point joystick controllers, each with a single fire button control. Both units share a common port using a 9-pin DB9 male connector on the side of the console.

With the exception of a single driving line to each joystick, all five control lines from each joystick (UP, DOWN, LEFT, RIGHT and FIRE) are connected together at the plug. Interference between signals is avoided by the use of diodes on each control line in each joystick unit. Adaptors for using other brand joysticks (i.e. Atari) alter the pin assignment configuration as well as supply the diodes in the adaptor unit as they are not normally used in other joysticks.

It is suggested that a joystick with a suspected problem be tested with another console as well as testing the console with a different joystick (if available) since joystick port problems may be either the fault of the console or of the joysticks. Joystick errors that are accom-

panied by keyboard errors are usually the fault of the console unit itself and not the joysticks.

When checking the joystick signal and driver lines for continuity, check the circuit, then switch the test leads used and test again. Since diodes are used, existing continuity may fail to appear unless polarity is reversed on the testing device.

POSSIBLE PROBLEMS & SOLUTIONS

- If one position on a single joystick fails (as opposed to the same position on two simultaneously connected units), it is most likely a mechanical problem related to that unit. Disassemble the joystick and test for continuity across the contact points on the position in question. The circuit should be completed when the joystick is moved towards that position. Also check for continuity from each of the lines from the joystick to the plug. If continuity exists, replace the diode connected to the control line affected by the problem position and test again.

- If the joystick will not operate the UP position, check the ALPHA LOCK key to make sure it is not depressed. Since the ALPHA LOCK may be sticking, go to TI BASIC and make sure that lower case can be entered as well as upper case when the ALPHA LOCK is depressed. If not, consult the section on keyboard repair. If the console has been modified with the addition of a diode to allow use of the UP position on the joysticks when the ALPHA LOCK is depressed, remove this diode and replace it with a piece of wire. In many consoles, the diode introduces a timing problem that will prevent proper function of the joystick and/or the ALPHA LOCK key. This commonly appears as an ALPHA LOCK malfunction after the console has been in use for a few minutes.

- If one position fails on both joysticks and the ALPHA LOCK function has been tested, check for continuity from each joystick control line to the plug. If continuity exists, check each key on the keyboard for proper function since all five control lines from the joysticks are connected directly to the keyboard control lines. If keyboard failure also occurs, replace the 74LS156 in the console and test again. If problems still exist, replace the TMS9901 and test again.

- If one joystick unit fails entirely, but not the other unit (or the same unit plugged into the other port of an adaptor), check for continuity from the driver line to the joystick (pin 2 or pin 7 on the plug, depending on which joystick is in question). If continuity exists, check (or replace) the driver transistor connected to that control line in the console located near the joystick port connector. Also check the appropriate driver line for a short to ground which would indicate a faulty capacitor or transistor between the driver line and ground. If errors still exist,

replace the 74LS156 in the console and test again.

- If both joysticks fail entirely, check each joystick with the above method. If problem is still not found, replace the TMS9901 in the console and test again.

BASIC-XBASIC

The following is by Jim Peterson of Tigercub Software. He writes:

In console BASIC, we had the ability to redefine characters from ASCII 32 to ASCII 159, and to add color to all character sets 1 to 16. With Extended BASIC, in order to make room in memory for sprites, it was necessary to restrict this capability to ASCII 32 to 143, character sets 1 to 14 (it is also possible to color character set 0). That is why console BASIC programs which use character sets 15 or 16 will crash, with a BAD VALUE error message, when they are run in Extended BASIC. With the 32k memory expansion, it again became possible to use character sets 15 and 16, and finally John Behnke published in the Chicago Times newsletter a remarkable CALL LOAD routine to access these characters. However, his VDPUTIL2 was 13 sectors long. Without having any idea how it worked, I used the "program that writes a program" technique to reduce it to 4 sectors, although with a slight increase in loading time. Finally, Barry Traver came up with the idea of making the subprogram call itself from line zero, so that it could be merged in without danger of overwriting anything.

First key in this routine.

```

30000 SUB BXB :: CALL INIT :
: CALL LOAD(8194,37,194,63,2
40)
30001 CALL LOAD(16368,80,79,
67,72,65,82,37,58,80,79,75,6
9,86,32,37,168)
30003 FOR J=1 TO 136 :: CALL
LOAD(9529+J,ASC(SEG$([\ ]$
,J,1))):: NEXT J :: SUBEND
30004 SUB CHAR(A,A$):: CALL
LOAD(9500,A):: CALL LINK("PO
CHAR",A$):: SUBEND
30005 SUB COLOR(A,B,C):: CAL
L LOAD(9492,8,15+A,(B-1)*16+
C-1)
30006 CALL LINK("POKEV"):: S
UBEND

```

Notice that line 30002 is missing. That is because there is no way to key it in. For that, we need a program that writes a program.

```

100 FOR J=1 TO 136 :: READ A
:: M$=M$&CHR$(A):: NEXT J
110 OPEN #1:"DSK1.BXBDATA",V
(See Page 46)

```


User Notes

(Continued from Page 45)

```

VARIABLE 163,OUTPUT :: PRINT
#1:CHR$(117)&CHR$(50)&""][\[ ]
$"&CHR$(190)&CHR$(199)&CHR$(
136)&M$&CHR$(0)
120 PRINT #1:CHR$(0)&CHR$(0)
&CHR$(157)&CHR$(200)&CHR$(4)
&"INIT"&CHR$(130)&CHR$(157)&
CHR$(200)&CHR$(3)&"BxB"&CHR$(
0)
130 PRINT #1:CHR$(255)&CHR$(
255):: CLOSE #1
140 DATA 2,224,37,20,3,0,0,0
,2,5,48,48,2,6,37,2,205,133,
2,134,37,17
150 DATA 17,252,4,192,2,1,0,
1,2,2,37,1,2,3,18,0,212,131,
4,32,32,20
160 DATA 208,4,9,80,2,32,3,0
,2,1,37,2,2,2,0,8,2,7,11,0,2
,8,7,0,193
170 DATA 1,192,193,193,180,9
7,133,145,135,21,1,113,136,6
,198,145
180 DATA 135,21,1,113,136,21
0,70,10,198,177,137,220,198,
2,131,37,10
190 DATA 17,240,4,32,32,36,1
6,6,2,224,37,20,3,0,0,0,4,32
,32,32,4

```

```

200 DATA 192,216,0,131,124,2
,224,131,224,4,96,0,112

```

Run that to create a file called BXBDATA on the disk. Then load the first program and enter MERGE DSK1.BXBDATA. The missing line will pop into place. Save the result by SAVE DSK1.BXB, MERGE and you can merge it into any console BASIC program, when needed, by MERGE DSK1.BXB.

This routine will run 99 percent of BASIC programs with no trouble. On rare occasions you may get an error message "STRING TRUNCATED IN 30004." This means that the BASIC programmer has used more than 16 characters in the hex code of a CALL CHAR. Console BASIC ignores the extra characters and Extended BASIC uses them to define the next higher ASCII, but they will crash BXB, so just delete them.

If the programmer has used multiple colons to scroll text, the computer will usually space these apart when loading into Extended BASIC. However, it will occasionally arrange them into pairs, which are statement separators in Extended BASIC. A pair of colons immediately after a PRINT will cause a syntax error, and two pairs in succession will lock up the computer. The solution is simple — insert semi-colons

between the colons.

Of course, you can also use BXB when programming in Extended BASIC, to utilize all 16 character sets for color and graphics — actually 17, because character set 0 is also available. Even ASCII 24 through 31 can be redefined. Craig Miller has warned against fooling around in that area of memory, but there seems to be no problem with redefining the cursor (30) or the edge character (31).

Sprites can only use characters between ASCII 32 and 143. CALL COLOR cannot be used to recolor sprites, and a single CALL COLOR cannot be used for multiple character sets. As mentioned above, CALL CHAR is limited to one 16-byte hex code, and CALL CHARPAT cannot return the hex code of an ASCII above 143.

If you don't have time to key this in, send \$3 for a diskfull of this and other utility programs to Jim Peterson, 156 Collingwood Ave., Whitehall OH 43213.

User Notes are compiled from a variety of sources, including user group newsletters and readers. MICROpendium pays \$10 for items submitted by readers for use in this column. Send items to: MICROpendium User Notes; P.O. Box 1343, Round Rock, TX 78680.

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