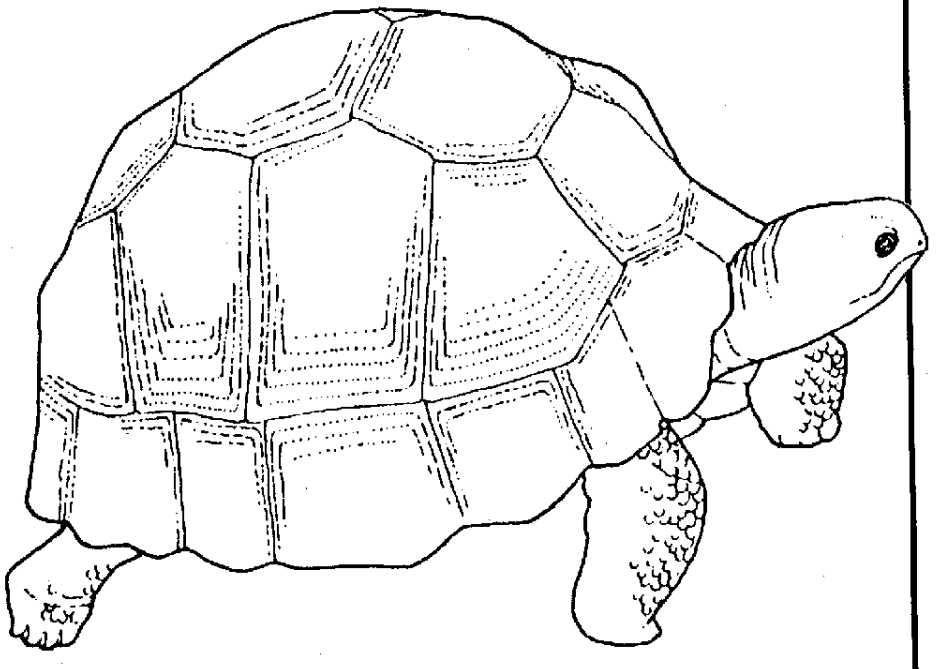
Covering the TI99/4A, the Myarc 9640 and compatibles

MICROpendium

Volume 4 Number 1 February 1987 $1.50

Using Logo



The turtle comes out of its shell

Reviews

TI-Mouse
TI-Tax

User Notes

Save and recall screens while running Extended BASIC programs

Inside

Mack McCormick on things to come
J. Peter Hoddie on XBII and TI-Artist
Regena on combining BASIC colors

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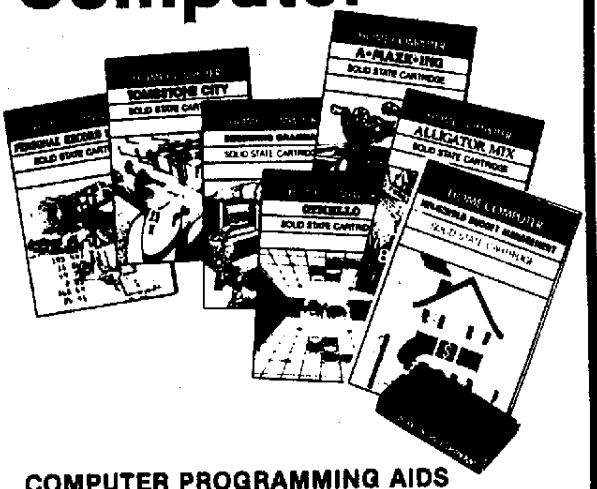

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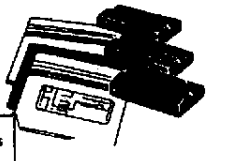

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- Review of Myarc's 9640
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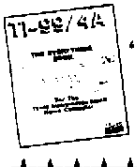

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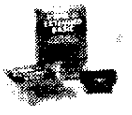

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Comments

What about Triton's PC clone?

1987 promises to be a big (and perhaps controversial) year for TI users, what with the imminent release of Myarc's 9640 and Triton/MG's Turbo-XT clone. We've got an article this month about the Turbo and were hoping to get a mini-review of the 9640, but that will come next month.

Although I have not used either of the new machines, my intention is to purchase only one—the Myarc 9640. I think it represents an innovative approach to system upgrading and at a reasonable cost. The Turbo-XT, on the other hand, doesn't break any new ground. In fact, it's nothing more than a garden variety PC clone, judging from how Triton describes it. The only reason we even published a story about it was because of the little bridge box that is used to connect the TI99/4A keyboard to the Triton system unit. Otherwise it is indistinguishable from any of the clones advertised in the pages of Computer Shopper.

One illuminating detail about the Turbo XT is that among the various configurations Triton offers, several do not include a bridge box, just a PC-type keyboard. Anyone who buys a Turbo with a bridge box will probably want to replace it and the 99/4A keyboard with a PC keyboard. Simply put, the 99/4A is a very poor keyboard to use with a PC. The absence of dedicated function keys and other keys to match a standard PC layout will make the Turbo XT a frustrating experience. My bet is that the bridge box will go the way of last year's Christmas tree as soon as purchasers realize that a PC keyboard can be had for less than $70 virtually anywhere.

My recommendation to anyone in the market for a PC is to buy a PC, whether the Triton system or another. Forget about the bridge box, which is nothing more than a substitute for the PC keyboard a PC should have. You want one, buy the whole thing.

If it's expansion you want, you may want to wait, as we are, for the release of the 9640. This system will use your existing software and peripherals and provide ample room for growth. Right off the bat you'll get a a PC-type keyboard, 9640 PEB card, enhanced version of TI-Writer and an 80-column version of Multiplan. Also Advanced BASIC III, a Pascal run-time program (can't be used for programming in Pascal) and Myarc's disk operating system. Beyond this, the system requires a analog RGB monitor but will operate with your existing peripherals. Like the Turbo XT, the 9640 won't have a cartridge port. Unlike the Turbo, you'll can dump your cartridges to disk and access them from there. (Devices such as MG's excellent GRAM Kracker won't be of use with the 9640).

Which is not to say that the TI99/4A needs to be replaced. The only computer I have at home is a fully-configured TI, and it's the machine I use for most of my business and recreational computing. It is still the computer I turn to late at night when it's time to write an article or work on a spreadsheet. It's the computer I run our accounts receivable out of and it is the computer I use for telecommunications. (I'm not an aficiando of computer games. About the only game I play on any system is U.S. Open Tennis by Nicesoft, and that's because I play tennis.)

As a result of the introduction of these two machines I'm getting a larger than normal number of calls from programmers and others wondering where the heck the TI market is going. I may as well tell you what I tell them:

- I think those who use their TI's a lot will continue to use them, or a compatible.
- Those in the TI community will continue to watch what develops with the 9640 and the Turbo XT, though for the life of me I can't see why the Turbo XT should be viewed as anything more than a PC clone.
- Support for the TI will continue much as it has over the past three years. If the 9640 is successful, expect to see a flurry of new or enhanced TI99/4A software.
- Hobbyists and programmers throughout the western world will continue to experiment and produce scores of innovative products designed for exclusive use with the TI99/4A.
- Barring a natural disaster or accident, when 1988 rolls around, we will still be publishing a periodical devoted to the TI99/4A and compatibles.

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As exciting as things get with these new computers, don't overlook Myarc's hard disk controller. For $265, plus $45 for cables, users can control hard disks with capacities of up to 240 megabytes. (Check with Myarc on hard disk specifications.) Myarc is offering a 20-megabyte hard disk with a 60 ms seek time. The package price is $750. Of all the equipment I have connected to my TI, the piece I value most is the old WDS/100 hard disk. (It seems as if I'm plugging Myarc a lot in this column, but that's because the company is coming out with some very interesting products.)

FLIGHT SIMULATOR

Not-Polyoptic's Spad XIII flight simulator should be on the market this month. We've seen a version that is "75 percent" complete, and it represents an improvement over TI Flyer. In Spad XIII you control a World War I pursuit plane whose mission is to shoot down a couple of German planes and balloons and bomb a German airfield. Then you may fly a loop around the Eiffel tower and head back to your landing field. The program does a good job at duplicating the conditions of flying a very light plane. It is aerodynamically correct, and uses graphics and sound to good effect. I'm looking forward to seeing the final version.

—JK

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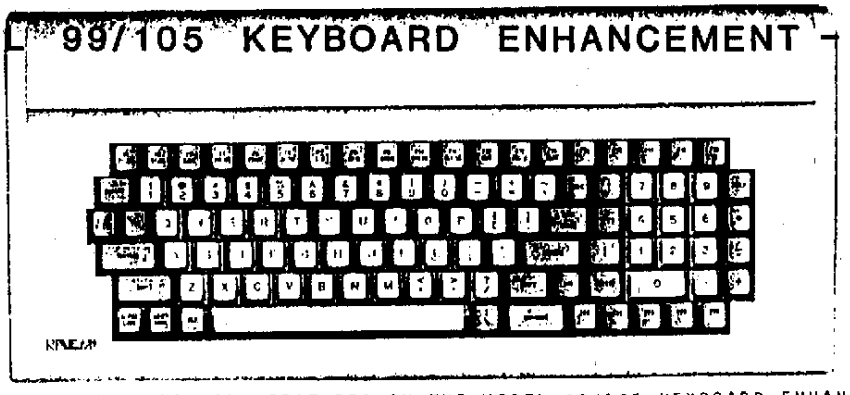

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Feedback

Languages for TI

Back in the November issue you asked for some feedback on how you should handle Forth. Let me say first that I've been pleased to find articles on Forth in your magazine. Forth articles are far and few between nowadays.

I feel that it is important for Forth articles to be available to people all of the time. If the TI is an "orphan" computer, then Forth is the "orphan" language of the TI. TI didn't even bother to finish it, and then shoved it off on the user groups. I'll wager that not many users had even heard of Forth at the time, much less knew anything about it.

As the user groups and bulletin board systems rallied to spread information about Forth, the TI world started its division into two camps: the diehard assembly programmers and everyone else. (I personally have nothing against assembly language and would like to learn it some day if I can find a book that makes any sense.) Anyway, it seems that people were finally starting to get somewhere with Forth when the language invasion started. Languages started appearing every month or so. At least it seemed like it.

People started flitting from language to language, never seeming to master any of them. Everyone was in search of the great "NEW BLUE CHEER." People forgot that the language one used was incidental. It wasn't the language that wouldn't do what people wanted, it was the fact that no one learned how to program properly. All programming is is solving a problem. It really doesn't matter what language one uses, as long as one programs properly. People don't know how to program.

In the great jungle of languages out there, it's impossible to tell which one is going to come out on top. There's Logo, Logo 2, Assembly, Forth, C, Pascal, two versions of Pilot, just recently there was Super 4th and there are also Wycove Forth, BASIC, Extended BASIC, Myarc's Extended BASIC 2, and I understand that the 9640 will support COBOL and FORTRAN, and who knows how many languages I've forgotten to mention.

All of the "names" in the TI world dropped Forth rather quickly, and seemed to have jumped on the C bandwagon. This is their right, and it can be rightly argued that anyone who would leave Forth on a whim for another language wasn't really dedicated to Forth in the first place. Unfortunately, the people who left Forth for C were the "doers." Since they've left, the articles and tutorials have dried up. People like me who are trying to learn Forth need all the help that we can get. Despite what most other people say, the Brodie book, *Starting Forth*, didn't do much for me.

The TI Forth community is in need of any and all information it can get, so I would recommend articles on Forth, tutorials on Forth and a Forth column.

No, perhaps it would be better just to have a language column. It could be set up on a rotating basis, a language a month. It could cover Forth, C, Pascal, Assembly, Pilot and Extended BASIC. Set up like that, one would need only two columns a year in any one language. It might be easier to find someone to write them if he knew he only had to do two columns. Any articles or tutorials could be published whenever they were available.

John H. Carver Jr.
Bringhurst, Indiana

We welcome submissions about the TI related to any programming language—Ed.

Learning assembly

I trust that you will keep up the good articles on assembly language programming which I would like to become proficient in. Being 68 years old it takes me a little longer to learn things than my 16-year-old grandsons. However, I have the patience and persistence that they have not as yet acquired.

Larry Polisse
Syracuse, New York

Suggestions for graphing software

I recently purchased "Business Graphs 99" by Mike McCann, and I am thoroughly pleased with this excellent and long-needed graphing software.

I especially like the ease with which data files for the line graph can be created by other programs. As an engineer and a student, I recommend it. I have a few suggestions for the next generation of graphing software:

- Put a right border on the line and bar charts (this is a small inconvenience, which a ruler and pen quickly set right).
- Make the size of the printed graph selectable, up to a full page. Scientific graphs are not much good unless you can read information off them, which is hard to do on a 2x3-inch plot.
- Make the labels and titles a bit longer, and (optionally?) loadable with the data file, so that you can save *all* the graph and not forget what you're looking at when you load it up later.

Finally, in Ron Albright's March review, he mentions a program to convert graphs to TI-Writer-printable format. Could we hear more about this?

David Ormand
Tucson, Arizona

Try Jack Coleman's program on page 45 on the September 1986 MICROpendium.—Ed.

Software makers don't know TI exists

Could you make an attempt at telling the software manufacturers that our computer exists?

I'm tired of seeing and hearing my fellow workers (I'm an air traffic control assistant at Calgary International Airport) bragging about their programs for the C-64, Just yesterday (9 Jan. I examined an instruction manual for something called "GUNSHIP." It is available for all sorts of computers except the 4A. The maker of this pro-

(Please turn to Page 10)

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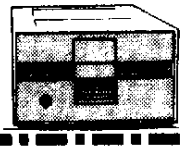

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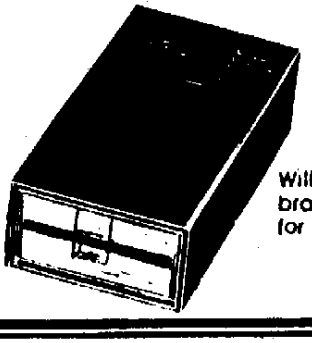

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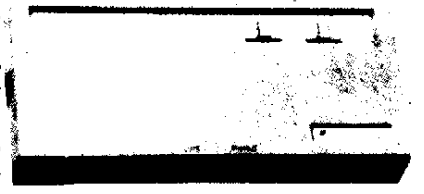

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Feedback

(Continued from Page 8)

gram must have used a cross-compiler to translate into those half-dozen computers. Why not the TI? Or is it the case that TI owners know too much, therefore these software makers won't put out for the TI because they are afraid of piracy? One thing I found is the above program is pricey, $80 Canadian. They do have a captive market, because the people I know who own other computers have more money than brains, and therefore will fork out at this price.

If they kept the price reasonable, none of the piracy would happen. It's really like counterfeiting; who would bother copying a dollar? I paid for the series of programs Computer War, Submarine Commander and River Rescue in cold Canadian cash for U.S. equivalent, and for programs in module form. The above three I use often. Barely any of the rest are worth the fire sale prices they now charge. I'm sure us TIers would pay MORE for programs that took more to make.

I guess it's really a case of finding a happy medium for the cost (between piracy and exorbitant charges).

Possibly my above comments are wasted if MG makes (an IBM) peripheral at a reasonable cost. Certainly the cost of IBM-compatible cards are getting cheap.

However, if they used all of the capabilities of the TI, we would have something to brag about!

David Lovering
Calgary, Alberta, Canada

About printing games

In the December issue, you printed the game 3-D Tic-Tac-Toe and said it was the first game you ever printed and wanted to know what your readers thought.

Well...

Personally, I don't mind seeing games every now and again. I don't want to see your magazine full of them. I do prefer tutorials and applications articles more. But if the games are first rate and there is code in them that one can learn from I won't mind.

Have you ever thought of sending out a questionnaire to cover all the questions you guys keep asking?

Bart Busse
Neidpath, Saskatchesan, Canada

Not really ready to do that—we appreciate readers like you who are interested enough in our questions to answer.—Ed.

Quiet fan, computer paradise

Two short notes:

1. There have been several letters in MICRO outlining various methods of changing out the fans in the PE Box to reduce the noise. I think a simpler way is a tip I picked up from my brother Bob in New Jersey. Go to a hardware or discount store and pick up a Fan Limit Control switch (similar to a light dimmer control). Cut one of the wires going to the fan and wire the switch to the ends. Turn on the power and reduce the rpm of the fan to a comfortable noise level. Mine is now whisper quiet. For your information, I have six cards in the box. I use my computer four or five nights a week usually running about two to three hours a session and have never experienced a problem.

2. I recently purchased a Horizon RAMdisk, Mechatronic GRAM CARD from Ryte Data and the RAVE 99/101 Keyboard. I feel I have put my original old reliable 99/4A to rest, and am now operating on a modern state-of-the-art computer. The point I want to make is that with the GRAM CARD I transferred the Multiplan, Editor/Assembler and XBASIC cartridges to my RAMdisk. I then added the Multiplan operating disk along with the Funlwriter version of TK-Writer to RAM. Now, with a few keystrokes, I can have XBASIC, Multiplan, TK-Writer or E/A up and running within the blink of an eye, never having to insert a cartridge or a disk. I think I may have died and gone to heaven.

Jerry Wolff
Englewood, Ohio

TI phone answerer?

Has anyone successfully developed a hardware modification in order to use your TI as an inexpensive telephone answering machine, also which would incorporate the usage of the Speech Synthesizer capability? Any assistance would be appreciated.

Francis X. Gaston
Saskatoon TI Computer Club
Saskatoon, Saskatchewan, Canada

We do not know of any, but it seems that it would be technically possible. Comments from readers would be welcome.—Ed.

Perforated circuit boards for PE Box

I would like to pass on one possible solution to Mack McCormick's request for perforated circuit boards with an edge connector for the PE Box. TI makes "Lead-Edge" connectors which bolt on to the edge of standard 0.1 x 0.1-inch perf-board. While this is a rather expensive solution (about $6 each), it works.

The 30/60 0.1-inch connector is TI part number L2111121-30. It is available from the following source as part number C8-30: Digi-key Corporation, P.O. Box 667, Thief River Falls, MN 56701-9988.

It is probably available from other suppliers who distribute TI parts. It is a quality gold-plated connector which probably accounts for the price.

Jack H. Miller
Trenton, Michigan

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

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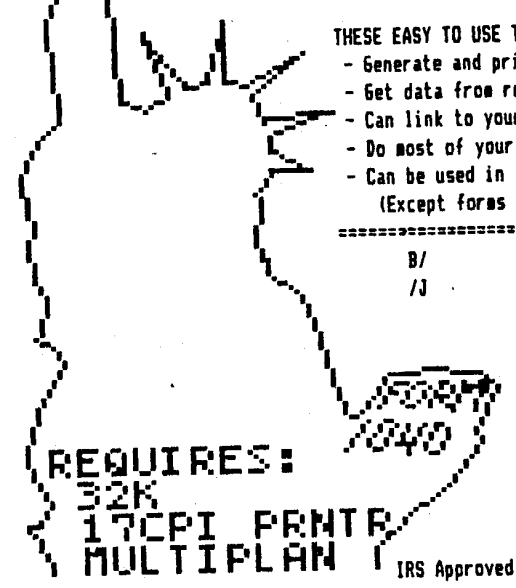

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IRS Approved forms:

Schedules A&B (Schedule A—Itemized Deductions OMB No 1545-0074 Attachment Sequence No. 07 1986

Name(s) as shown on Form 1040: Your social security number

Medical and Dental Expenses (Do not include expenses reimbursed or paid by others) (See instructions on page 1)
1 Prescription medicines and drugs; and insulin
2 a Doctors, dentists, nurses, hospitals, insurance premiums you paid medical and dental care, etc.
b Transportation and lodging
c Other(list—include hearing aids, dentures, eyeglasses, etc.)
3 Add lines 1 through 2c, and write the total here — 98.00
4 Multiply the amount on Form 1040, line 33 (98.00 X 7.5%(.075)) — 98.00
5 Subtract line 4 from line 3. If zero or less, write -0-. Total medical and dental — 98.00

Taxes You Paid (See instructions on page 20.)
6 State and local income taxes
7 Real estate taxes
8 a General sales tax (see sales tax tables in instruction booklet)
b General sales tax on motor vehicles
9 Other taxes(list--include property taxes)
10 Add the amounts on lines 6 through 9. Write the total here. Total taxes — 98.00

Interest You Paid (See instructions on page 20.)
11 a Home mortgage interest you paid to financial institutions
b Home mortgage interest you paid to individuals (show that person's name and address)
12 Total credit card and charge account interest you paid
13 Other interest you paid(list)
14 Add the amounts on line 11a through 13. Write the total here. Total interest — 98.00

Contributions You Made (See instructions on page 21.)
15 a Cash contributions.(If you gave $3,000 or more to any one organization, report those contributions on line 15b.)
b Cash contributions totaling $3,000 or more to any one organization.(Show to whom you gave and how much you gave.)
16 Other than cash.(You must attach Form 8283 if over $500.)
17 Carryover from prior year
18 Add the amounts on lines 15a through 17. Write total here. Total contributions — 98.00

Casualty and Theft Loses
19 Total casualty or theft loss(es).(You must attach Form 4684 or similar statement.) (See page 21 of instructions.)

Miscellaneous Deductions (See instructions on page 21.)
20 Union and professional dues
21 Tax return preparation fee
22 Other(list type and amount)
23 Add the amounts on lines 20 through 22.Write the total here. Total miscellaneous — 98.00

Summary of Itemized Deductions (See instructions on page 22.)
24 Add the amounts on lines 5, 10,14, 18, 19, and 23. Write your answer here. — 98.00
25 If you checked Form 1040:(Filing Status box 2 or 5, write $3,670; Filing Status box 1 or 4, write $2,480; Filing Status box 3, write $1,835). Box(0) — 98.00
26 Subtract line 25 from line 24.Write your answer here and on Form 1040, line 34a(If line 25 is more than line 24, see instructions for line 26 on page 22.) — 98.00

For Paperwork Reduction Act Notice, see Form 1040 instructions. Schedule A (Form1040) 1986

Schedule G: Income Averaging OMB No. 1545-0074 ATTACHMENT SEQUENCE: 1986 14

Name(s) as shown on Form 1040: Your social security number

Step 1 — Add your income from 1983--1985

1983 1 Fill in the amount from your 1983 Form 1040 (line 37), Form 1040A (line 16), or Form 1040EZ (line 7). If less than zero, enter zero.
1984 2 Fill in the amount from your 1984 Form 1040 (line 37), Form 1040A (line 19), or Form 1040EZ (line 7). If less than zero, enter zero.
1985 3 Fill in the amount from your 1985 Form 1040 (line 37), Form 1040A (line 19), or Form 1040EZ (line 7). If less than zero, enter zero.
Total 4 Fill in all income less deductions earned outside of the U.S. or within U.S. possessions and excluded for 1983 through 1985 (include housing exclusion).
5 Add lines 1 through 4 — 98.00

Step 2 — Figure your averageable income

6 Divide the amount on line 5 by three(3) — 98.00
7 Multiply the amount on line 6 by 140% (1.4) — 98.00
8 Fill in your taxable income for 1986 from Form 1040, line 37 — 98.00
9 If you received a premature or excessive distribution subject to penalty under section 72, see instructions.
10 Subtract line 9 from line 8 — 98.00
11 If you live in a community property state and are filing a separate return, see instructions.
12 Subtract line 11 from line 10. If less than zero, enter zero — 98.00
13 Write in the amount from line 7 above — 98.00
14 Subtract line 13 from line 12. This is your averageable income. If this line is $3000 or less, do not complete the rest of this form. — 98.00 END

Step 3 — Figure your tax

15 Multiply the amount on line 14 by 25% (.25) — 98.00
16 Write in the amount from line 7 above — 98.00
17 Add lines 15 and 16 — 98.00
18 Write in the amount from line 11 above.
19 Add lines 17 and 18 — 98.00
20 Tax on amount on line 19 (from Tax Rate Schedule X, Y, or Z).
21 Tax on amount on line 17 (from Tax Rate Schedule X, Y, or Z). 98.00
22 Tax on amount on line 18 (from Tax Rate Schedule X, Y, or Z). 98.00
23 Subtract line 22 from line 21 — 98.00
24 Multiply the amount on line 23 by 3 — 98.00
If you have no entry on line 9, skip lines 25 through 27 and go to line 28.
25 Tax on amount on line 8 (from Tax Rate Schedule X, Y, or Z). 98.00
26 Tax on amount on line 10 (from Tax Rate Schedule X, Y, or Z). 98.00
27 Subtract line 26 from line 25 — 98.00
28 Add lines 20, 24, and 27. Write the result here and on Form 1040, line 38 if less than the tax figured using the tax rate schedules or table. Also, check the Schedule G box — 98.00

For Paperwork Reduction Act Notice see Form1040 instructions Schedule G (Form 1040) 1986

BASIC/XBASIC

Combining colors expands BASIC palette possibilities

By REGENA

When the TI99/4A was first being sold, it was the only computer that could have 16 colors on the screen in high resolution graphics.

Other computers may have advertised more colors, but they were limited in what color combinations could be used, or perhaps only four colors were really available in high resolution graphics. I got "spoiled" using my TI for graphics and had a lot of fun with the colors.

Now, of course, home computers are advertising even more colors (512 or 4096), and with the expanded memory capabilities of the present computers many more colors are available on the high-resolution screens. But wait—our little 16K computer still has a great capability for color graphics!

Are there really just 16 colors? Theoretically, yes, the BASIC commands allow for 16 color numbers. However, by using different combinations of colors, you can actually see many more colors. The short program included this month illustrates some of the colors.

First let's take a look at the color commands used in graphics in TI BASIC (or Extended BASIC). The colors are numbered from 1 through 16, and those numbers (or variables representing those numbers) may be used in the color commands. Color Number 1 is "transparent" and is actually whatever screen color you have at the moment. If you have a green (4) screen, then using Color Number 1 would be just like using Color Number 4. Therefore, we really only have 15 specified colors.

To specify a screen color, use CALL SCREEN(n) where n represents a color number. You may use this command anywhere in the program, and when the computer comes to the command the whole screen will change to the specified color. Even though we really have only 15 colors, you can actually see different shades because the color of the screen depends on how much printing or other characters are on the screen. For example, make a black screen, then start placing white stars on the screen. The more stars you place on the screen, the darker the screen color becomes.

Be careful with CALL SCREEN(2), which is a black screen. If you print in black you won't see the printing on a black screen. However, you can use this feature as a programming technique to make printing appear all at once. First change the screen to black and clear the screen, then print what you want, such as a title screen or a menu screen. Without changing any character colors you will be printing in black on the black screen and won't actually see the printing. After your printing is complete, change the screen color, such as CALL SCREEN(8). The screen changes from black to the specified color and you will see the printing.

The default colors for all characters are a black foreground with a transparent background. CALL COLOR(s,f,b) defines colors for characters. There are 16 color sets, each containing eight colors; "s" in the CALL COLOR statement specifies the color set number, "f" is the foreground color and "b" is the background color. If you specify a background color other than transparent or the screen color, your characters will look like blocks on the screen with your defined colors. For example, change some of the alphabetic colors to black on white with CALL COLOR(7,2,16). Now print several words. Any letters in color set 7 will have the white background.

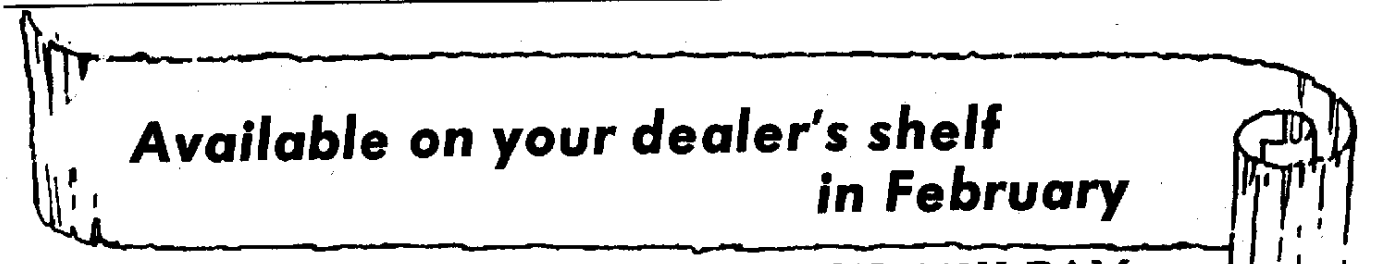
Just as the screen color appears to change as you have different things on the screen, the character colors will look different with different combinations of foreground and background colors. Now if you experiment with different foreground, background and screen colors, as well as surrounding colors, you'll really get a varying pallette of colors. To illustrate this, I have written the following program for Color Combinations.

You will be asked to enter a screen color number, then a foreground color number, then a background color number. After the three numbers are entered, several patterns are shown on the screen. The first square has a checkerboard design alternating dots in a defined character. The second square shows a pattern of vertical lines and the third square shows a pattern of horizontal lines. The fourth and fifth squares use patterns of diagonal lines. You might wish to design your own patterns in the 8x8 character definitions.

The five patterns are printed with your specified foreground and background colors. The surrounding squares are printed in the color you specified as a screen color. I did not actually change the screen color but used that entry as the squares around the high-resolution patterns. You may prefer to adapt this program to actually change the screen color with CALL SCREEN(). The colors will appear slightly different than when you just use surrounding blocks.

Remember that whenever you use a CALL COLOR command, all characters currently on the screen are affected. This program continues to ask for screen color, foreground color and background color, so the patterns on the screen will change as you enter different numbers. After every three numbers entered, the patterns are drawn on the screen. If you see color combinations that you like, jot down the

(See Page 14)



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(Continued from Page 12)

color numbers for use in your own programming. The program continues until you press FCTN-4 to stop.

Lines 120-180 clear the screen and print the instructions. Line 190 defines the first background color as transparent. Lines 200-260 define the high-resolution characters used in the patterns. Character 97 is the checkerboard pattern for the first square. Character 98 is the vertical line pattern for the second square. Character 99 is the horizontal lines pattern for the third square. Characters 100, 101 and 102 are used for the diagonal lines pattern in the fourth square. Character 103 is used for the diagonal lines pattern in the fifth square.

Line 270 defines L$ for use in printing the surrounding colored blocks. Lines 280-400 ask for the color numbers, then define those colors chosen. Lines 410-450 print the pattern blocks, then Line 460 branches back to Line 280 to continue asking for color numbers.

Please release the ALPHA LOCK key to types Lines 270, 430 and 440. The characters defined for high-resolution are in sets 9 and 10 so the lowercase letters can be used to PRINT the graphics rather than using CALL HCHAR and CALL VCHAR.

Lines 470-630 contain the subroutine to receive the color numbers using CALL KEY. The key pressed has ASCII Code K and must be a number key. If the first number pressed is greater than 1, C1 is the color number and the computer returns to the main program. If the first number pressed is 0 or 1, the color number then can be a two-digit number and another CALL KEY is necessary.

Color Combinations

```
100 REM COLOR COMBINATIONS
110 REM BY REGENA
120 CALL CLEAR
130 PRINT "COLOR COMBINATIONS"
140 PRINT : : :"ENTER A SCREEN COLOR NUMBER
,"
150 PRINT :"A FOREGROUND COLOR NUMBER,"
160 PRINT :"AND A BACKGROUND COLOR"
170 PRINT :"NUMBER.  PATTERNS WILL BE"
180 PRINT :"SHOWN USING THOSE COLORS.": : :
 :
190 B=1
200 CALL CHAR(97,"55AA55AA55AA55AA")
210 CALL CHAR(98,"AAAAAAAAAAAAAAAA")
220 CALL CHAR(99,"FF00FF00FF00FF")
230 CALL CHAR(100,"9224499224499224")
240 CALL CHAR(101,"4992244992244992")
250 CALL CHAR(102,"2449922449922449")
260 CALL CHAR(103,"99CC663399CC6633")
270 L$="hhhhhhhhhhhhhhhhhhhhhhhhhhhh"
280 PRINT "SCREEN NUMBER:"
290 C=19
300 GOSUB 470
310 CALL COLOR(10,C1,C1)
320 PRINT :"FOREGROUND COLOR:"
330 C=22
340 GOSUB 470
350 F=C1
360 CALL COLOR(9,F,B)
370 PRINT :"BACKGROUND COLOR:"
380 GOSUB 470
390 B=C1
400 CALL COLOR(9,F,B)
410 PRINT : : :
420 PRINT L$
430 PRINT "haahhhhbbhhhhcchhhhdehhhhggh"
440 PRINT "haahhhhbbhhhhcchhhhefhhhhggh"
450 PRINT L$: : :
460 GOTO 280
470 CALL SOUND(100,1400,2)
480 CALL KEY(0,K,S)
490 CALL HCHAR(23,C,63)
500 CALL HCHAR(23,C,32)
510 IF (K<48)+(K>57)THEN 480
520 CALL HCHAR(23,C,K)
530 C1=K-48
540 IF C1>1 THEN 630
550 CALL SOUND(100,1400,2)
560 CALL KEY(0,K,S)
570 CALL HCHAR(23,C+1,63)
580 CALL HCHAR(23,C+1,32)
590 IF (K<48)+(K>54)THEN 560
600 IF (K=48)+(C1=0)=-2 THEN 550
610 CALL HCHAR(23,C+1,K)
620 C1=C1*10+(K-48)
630 RETURN
640 END
```

New 'After Hours' BBS on line in Florida

Thomas W. Renfroe says he is running the "After Hours BBS" program with a 720K download section in Pensacola, Florida.

He says he is planning to extend to 2.8 megs for uploads and downloads. The board's message bases, user files and text files are on a Myarc 512K RAMdisk. Modem is the Hayes Smartmodem 1200.

He says the message base topics are slightly different from those on the original After Hours BBS.

The board operates at (904) 453-4201 weekdays from 4 p.m. to midnight Central Time and weekends from 1 p.m. to 1 a.m. Requires 300/1200 baud, eight data bits, no parity and one stop bit. Renfroe says he will extend the hours if the amount of usage calls for it.

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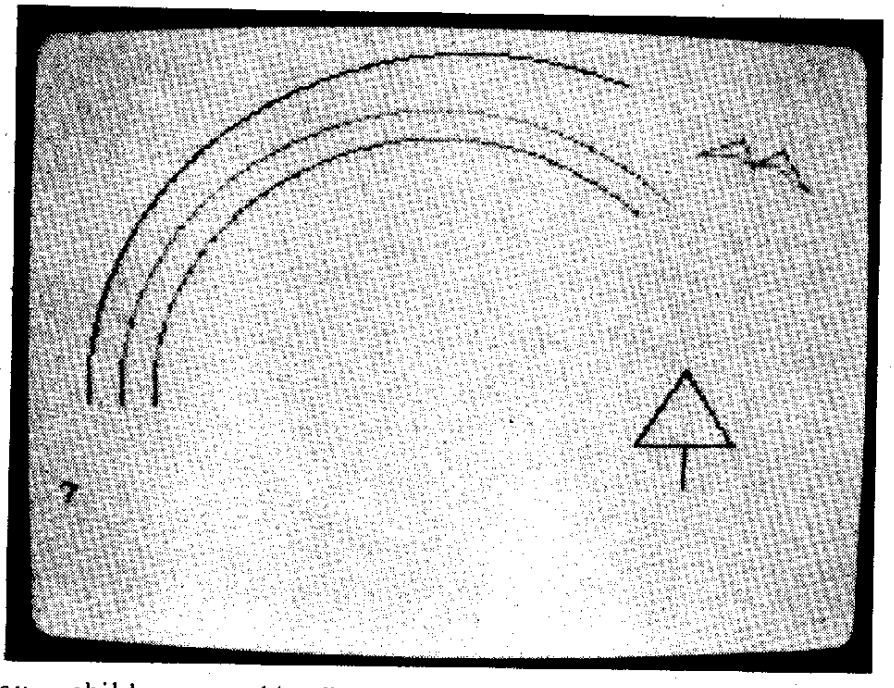
"The Leader of the Pack"

—Learning about Logo—

The turtle comes out of its shell for some simulated animation

By SUSANNE JOHNSTON



Logo is a fun and powerful language that was developed to convey those two concepts. Seymour Papert and colleagues at MIT's Artificial Intelligence Laboratory developed the language in the 1960s. In the early 1980's LOGO was first made available to the public on the TI99/4 and is now available on most microcomputers.

LOGO was developed to emulate the way children acquire knowledge. From birth, children learn at a phenomenal rate through informal interaction with their environment. LOGO was designed to be an extension of this type of informal learning, thus embodying the nature of thinking in a machine. It is an interactive environment that conveys complex principles through simple abstract interaction with the computer. Let's look at the language to see how this is accomplished.

All you need is the keyboard, monitor, TI Memory Expansion Unit or Peripheral Expansion Box with 32K memory expansion card and LOGO or LOGO II cartridge. A disk drive, cassette tape player or printer may be used to save procedures.

First select the LOGO language and then type TELL TURTLE to enter Turtle Graphics mode. Turtle Graphics uses a "Turtle" to draw designs on the screen. The LOGO Turtle was conceived with two features in mind: position and heading, so that it may be related to a person, who also has position and heading. When children are designing with the Turtle they are encouraged to "play turtle." That is, when they are developing a design, they first walk it out on the floor and then transfer this knowledge to the Turtle through the keyboard. Thus, LOGO is interactive; commands are typed in at the keyboard and then executed, just as when children interact with their environment they learn most easily.

Press ENTER and the Turtle should appear in the screen center. It is an equilateral triangle with one point facing upward. This is its direction or heading. Relative heading may be changed by typing RIGHT (RT) or LEFT (LT) and some number (which corresponds to heading on a compass). Type RT 45 (ENTER) and the Turtle will rotate right 45 degrees. To change heading to an absolute value, we can use SETHEADING (SH) and specify an angle between 0 and 360. This opens the door to the study of geometry and trigonometry.

To move the Turtle and draw a line, type FORWARD (FD) or BACK (BK) and some number. Try FD 50 and draw a line 50 units long. Sometimes the Turtle may obscure parts of a design. To eliminate this problem, the HIDETURTLE (HT) command will allow drawing to continue without displaying the Turtle. To bring it back type SHOWTURTLE (ST). To move the Turtle to another location without drawing, type PENUP (PU) and then use heading and move commands. To resume drawing type PENDOWN (PD).

Sometimes in graphics work we want to place the Turtle in a specific, absolute location on the screen. This can be done with SXY, which needs two inputs and places the Turtle at the corresponding X,Y screen location without drawing a line from the current position to the specified position. The available coordinates are shown in Figure 1.

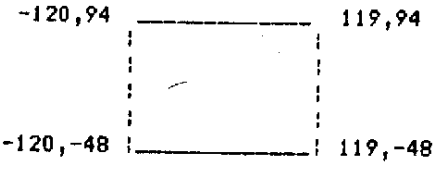


Figure 1. LOGO Turtle Graphics screen coordinates.

(See Page 18)

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LOGO—

(Continued from Page 16)

The Turtle will locate beyond these coordinates but shifts to the opposite side of the screen when a line is drawn. If you specify a line length that goes beyond the screen edge it will wrap around and come in on the opposite side of the screen.

In many graphics applications it is important to determine the screen coordinates of a particular point in a design. XCOR and YCOR will read the current Turtle position on the screen. If some lines are drawn that later need to be erased, type PENERASE (PE) and direct the Turtle over unwanted lines. To draw again type PENDOWN (PD).

To draw in color, which can be interesting even on a monochrome monitor, type SETCOLOR (SC) and a number between zero and 15, or SC :BLUE or some other color. To change background color type COLOR-BACKGROUND (CB) and a number or color.

Another important feature of knowledge is modularity. That is, it is broken into "mind-size bites" that are easily understandable. LOGO is also modular or procedural. Each step in a program is broken down into individual, understandable procedures. Those procedures are then combined to make the complete program. In interactive LOGO Graphics the LOGO primitives such as RIGHT and LEFT are words the computer recognizes. With procedures, several commands may be put together to define a new word. When that word is typed, the whole sequence of statements is executed.

To define a procedure, it is best to choose a name that describes the function of the procedure. Pick a name like CURVE and type TO CURVE (ENTER). This activates the procedure editor and you should see:

```
TO CURVE
END
```

Press ENTER and then type:

```
FD 20
RT 30
FD 20
RT 30
FD 20
RT 30
```

When finished, press FUNCTION-9 to exit edit mode and store the procedure in main memory. Now type CURVE and see a short curve drawn. We can enhance this procedure by adding variables, another powerful mathematical tool introduced informally in LOGO. Variables may be used in CURVE to move ahead and turn by typing:

```
TO CURVE1 :AHEAD :ANGLE
FD :AHEAD
RT :ANGLE
FD :AHEAD
RT :ANGLE
FD :AHEAD
RT :ANGLE
```

Exit edit mode and type CURVE1 20 30 and see the same curve drawn. Other numbers will change the size and angle. To draw a longer curve and save typing time use the repeat feature.

```
TO CURVE2 :AHEAD :ANGLE
REPEAT 60 [FD :AHEAD RT :ANGLE]
```

First clear the screen (CLEARSCREEN or CS) and then CURVE2 4 6 will draw a circle.

Another powerful mathematical tool exemplified in LOGO is recursion, where a procedure definition refers to itself, which suggests an infinite process.

```
TO CURVE3 :AHEAD :ANGLE
REPEAT 60 [FD :AHEAD RT :ANGLE]
RIGHT 10
CURVE3 :AHEAD :ANGLE
END
```

This procedure calls itself and is thus in an infinite loop that continues drawing circles, if you select CURVE3 4 6, until you stop it (FUNCTION-9) or the "pen runs out of ink." "OUT OF INK" is an error message that occurs because character graphics mode was used for TI LOGO implementation rather than bit-map mode. You will have to CLEARSCREEN to continue.

We have seen how LOGO introduces angle, variable, recursion and modularity through abstraction in an informal and fun way that encourages further exploration. Now we'll put some of these features to work and build a complete program. This example will demonstrate most of the LOGO primitives discussed but will do a bit more than just draw a picture. The design will have a rainbow and tree, and a bird will fly across the screen using simulated animation. Figure 2 shows the hierarchy of procedures called by main procedure ANIMATE.

```
I. ANIMATE
  A. RAINBOW
    1. START
    2. CURVEUP
  B. TREE
  C. FLY
    1. BIRDUP
      a. LEFTWING
      b. RIGHTWING
    2. BIRDDOWN
      a. LEFTWING
      b. RIGHTWING
    3. ERASBRDUP
      a. BIRDUP
        1. LEFTWING
        2. RIGHTWING
    4. ERASBRDDWN
      a. BIRDDOWN
        1. LEFTWING
        2. RIGHTWING
  D. BIRDUP
    1. LEFTWING
    2. RIGHTWING
```

Figure 2. Procedural hierarchy of main procedure ANIMATE.

First we have to prepare the screen to draw a picture. Procedure START hides the Turtle, clears the screen, color3 the background purple and places the Turtle in the lower left quadrant. Some variables will be needed to draw a curve so initial values for those are set in START. START also stores the starting X,Y Turtle position in POTOGOLDX and POTOGOLDY.

My rainbow design is a series of curved lines. CURVEUP uses a modified version of the CURVE procedure discussed earlier to draw a curved line. Notice that length of the curve, DISTANCE, and angle of the curve,

(See Page 20)

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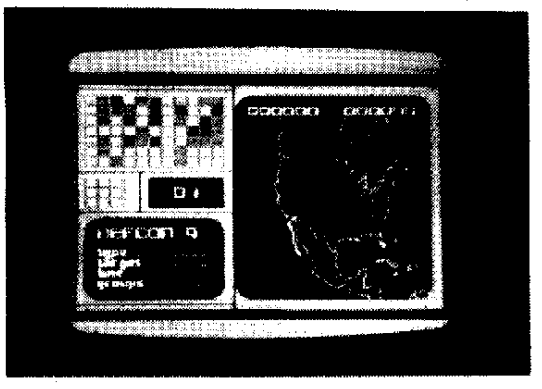

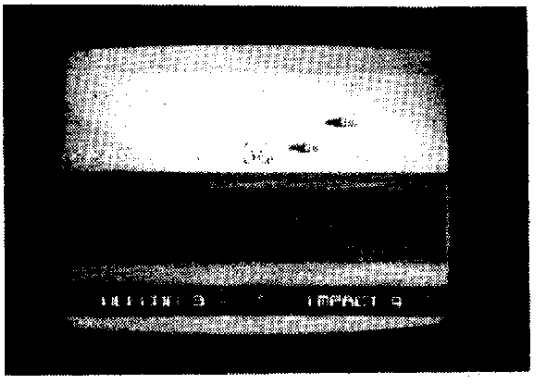

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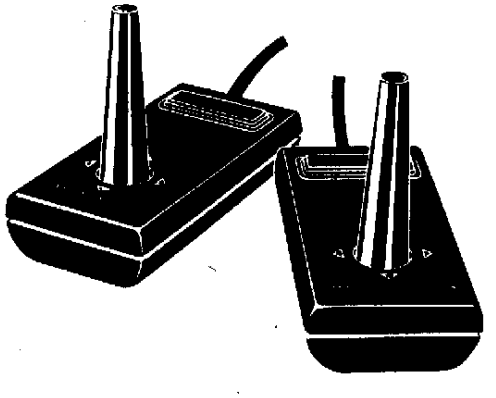

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LOGO—

(Continued from Page 18)

AHEAD and ANGLE, which were initially defined in START, change as the procedure is run. DISTANCE, for example, is defined as 70 in START. The first time through CURVEUP it is changed to 58, the second time to 46, and the third time to 34. This is so the curves of the rainbow will nest properly without overlapping.

To draw the second rainbow band, the Turtle returns to the bottom left quadrant by having stored the X and Y coordinates in variables POTOGOLDX AND POTOGOLDY. The Y coordinate remains the same but X moves to the right with POTOGOLDX + 10. These two procedures, START and CURVEUP, go together to draw a complete rainbow.

RAINBOW sets the screen up with START, sets Turtle drawing color to red and draws the first band with CURVEUP. Then Turtle drawing color changes to orange and the second band is drawn. To complete the rainbow, the drawing color changes to yellow and a third band is drawn.

With RAINBOW complete, the se-

(See Page 22)

Logo procedures

```
TO RIGHTWING
RT 40
FD 10
RT 90
FD 15
RT 160
FD 12
LT 41
FD 6
END

TO LEFTWING
LT 40
FD 10
LT 90
FD 15
LT 160
FD 12
RT 30
FD 6
END

TO ERASBRDDWN
PE
BIRDDOWN
PD
END

TO ERASBRDUP
PE
BIRDUP
PD
END

TO BIRDDOWN
SH 350
LEFTWING
SH 50
RIGHTWING
END

TO CURVEUP
MAKE "DISTANCE :DISTANCE - 12
MAKE "AHEAD :AHEAD + 1
MAKE "ANGLE :ANGLE + 1
SH 0
SXY :POTOGOLDX :POTOGOLDY
REPEAT :DISTANCE [FD :AHEAD RT :ANGLE ]
MAKE "POTOGOLDX :POTOGOLDX + 10
END

TO START
HT
CS
CB :PURPLE
WAIT 100
SXY -110 -20
MAKE "POTOGOLDX XCOR
MAKE "POTOGOLDY YCOR
MAKE "DISTANCE 70
MAKE "AHEAD 3
MAKE "ANGLE 1
END

TO BIRDUP
SH 20
LEFTWING
SH 20
RIGHTWING
END

TO FLY
PD
SXY -50 -30
SC :LEMON
BIRDUP
SXY 0 0
BIRDDOWN
SXY -50 -30
ERASBRDUP
SXY 50 30
BIRDUP
SXY 0 0
ERASBRDDWN
SXY 90 60
BIRDDOWN
SXY 50 30
ERASBRDUP
SXY 90 60
ERASBRDDWN
END

TO RAINBOW
START
SC :RED
CURVEUP
SC :ORANGE
CURVEUP
SC :YELLOW
CURVEUP
END

TO ANIMATE
RAINBOW
TREE
REPEAT 8 [FLY ]
BIRDUP
END

TO TREE
SXY 70 -5
SH 0
SC :OLIVE
LT 150
FD 30
LT 120
FD 15
RT 90
FD 15
BK 15
LT 90
FD 15
LT 120
FD 30
END
** DONE **
```

Triton schedules March 1 release of MG-designed PC clone system

The Triton Turbo XT Personal Computer, a product which allows IBM processing using a TI console, has been developed by MG for marketing by Triton Products of California. MG was formerly known as Miller Graphics.

The two-part system consists of a PC-type system unit that houses peripherals and cards and a bridge box that plugs into the side I/O port of the TI99/4A. A cable connects the bridge box to the PC unit.

The Turbo XT uses an Intel 8088 microprocessor with software switchable clock speeds of 8 and 4.77 Mhz.Also included is a color graphics card that supports RGB color and composite video, a floppy disk controller, one half-height DS/DD disk drive, parallel port and 256K RAM on the mother board. The mother board has sockets for up to 640K RAM. The system unit has 8 expansion slots, two of which are used by the CGA card and the disk controller, according to the manufacturer.

The bridge box has two modes: 4A and XT. The 4A mode includes a shared video output and a 99/4A input. The XT mode includes a keyboard output, video input and an XT video input. The box has five LED status lights.

The bridge box also contains a ROM for keyboard switching between 4A mode and XT mode and the ROM to convert the 4A key strokes into XT keycodes, the manufacturer says.

Mode switching from 4A to XT can be done through BASIC or XBASIC with CALL XT or by holding down FCTN CTRL ENTER on power up of the 4A, according to Triton.

Mode switching from XT to 4A is done by pressing the FCTN, CTRL and Enter keys, the manufacturer says.

The only items shared by the two systems are the 4A keyboard and the monitor. Although it is possible to get 80 columns out of a composite color monitor, the manufacturer says it is easiest to read with the color turned off in 80-column. The XT supports a 40-column mode. Graphics programs, such as games and drawing programs, work in 80 columns and most other software is readable, depending on the combination of foreground and background colors, the manufacturer says.

The manufacturer says that by not sharing the disk drives it is possible to do concurrent processing on the XT. According to Triton, the user can go into XT mode, start up communications software, log on to a BBS and start a download, then switch back to the 4A and do whatever he would like in 4A mode while the XT is still downloading from the BBS.

The manufacturer says the system has been tested on a number of 4A system configurations and found to be "very compatible," and says that since it is an IBM clone it is also fully compatible with both IBM software and IBM hardware, enabling the user to add any PC cards to the system.

Minimum 4A system requirements are a TI 99/4A console and a composite or RGB monitor.

Triton Products is handling the production of the bridge boxes and has contracted production of the Turbo XT.

The system has a 30-day money-back guarantee and a one year parts and labor warranty.

The cost for the basic system (Turbo XT, bridge box and cables) is $499 plus $19.90 for shipping and handling. Other configurations are available, including several that have a PC-type keyboard instead of a bridge box.

For additional information contact Triton at 1-800-227-6900, from 6 a.m. to 6 p.m. Monday through Friday and from 9 a.m. to 4 p.m. Saturday, Pacific time. Delivery of the product is scheduled to start March 1.

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- TMS 9900 H/W Organization
- TMS 9900 Instruction Set
- Interfacing Pitfalls
- Console Schematics
- PEB Card Descriptions
- GROM Simulator Design
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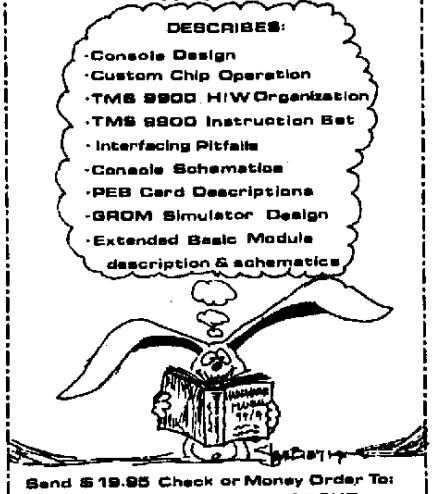

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LOGO—

(Continued from Page 20)

cond element, a tree, must be designed. I place the Turtle in the lower right quadrant to balance the rainbow, then set heading to zero and drawing color to olive, and draw a simple pine tree with TREE.

The final element designed is a bird. I designed a simple bird made of two wings, LEFTWING and RIGHTWING. To make it appear to fly, I gave it two positions, one with wings up, BIRDUP, and one with wings down, BIRDDOWN. The only difference between BIRDUP and BIRDDOWN is Turtle heading when it draws the wings. To simulate flight the bird will appear and disappear with alternating wing positions at different points across the screen, giving the illusion of movement. To make it disappear, ERASBRDUP uses PENERASE to trace the bird with BIRDUP, erasing it, and then puts PENDOWN. ERASBRDDWN does the same for BIRDDOWN.

Now the bird is ready to fly. FLY first makes sure the pen is down, positions the Turtle in the lower left quadrant, sets drawing color to lemon and draws BIRDUP. The Turtle moves up the screen with SXY and draws BIRDDOWN. Then the Turtle moves back to the original position with SXY and erases with ERASBRDUP. Then it jumps ahead of the bird with wings down and draws BIRDUP again. It then goes back to where BIRDDOWN was drawn and erases with ERASBRDDWN. It continues in this leap-frog type draw-erase sequence across the screen.

The three main elements of the project are now ready. We have a rainbow, a tree and a flying bird, each of which will stand alone. We have to put them all together in main procedure ANIMATE to make a simulated animation sequence. ANIMATE first calls RAINBOW, then draws a TREE. Then the bird flies across the screen eight times using the repeat feature with FLY. To balance the final scene I have ANIMATE draw the bird in wing-up position with BIRDUP.

This example shows how to develop a project from the top down by first deciding on the final product. Then it is broken down into "mind-size bites" and designed from the bottom up. Each minute step has its own procedure which functions on its own. The procedures are now in your library if you saved them on disk, and may be put together in other combinations or with other procedures to make different projects.

Two drawbacks of this type of graphics are lack of detail and simulated rather than actual animation. Detail cannot be increased with the Turtle because, although very little was drawn on the screen in this example, it came very close to "running out of ink." However, both obstacles can be overcome. A more detailed image can be drawn with more sophisticated animation using some other LOGO features, tiles and sprites. These topics will be discussed in a future article.

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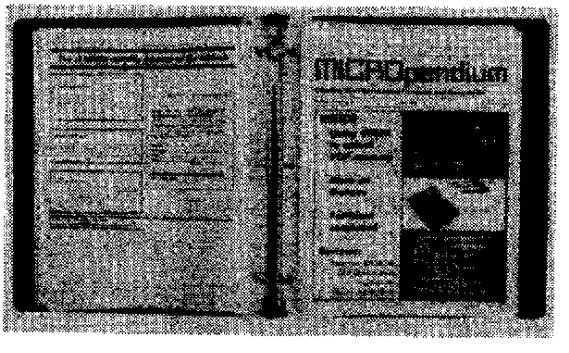

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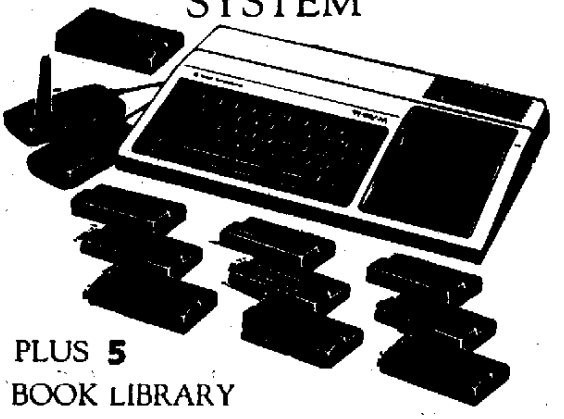

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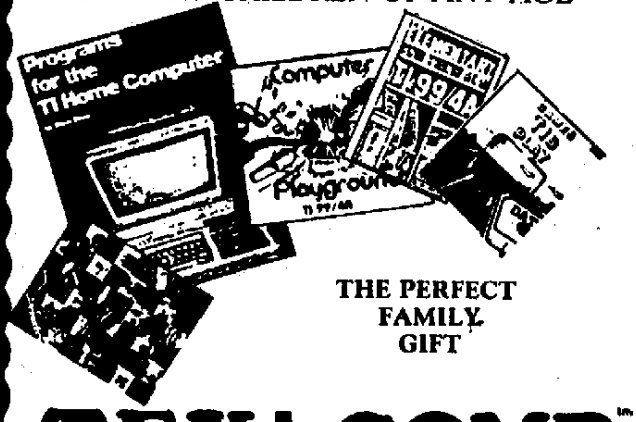

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Techie Corner

Disk-based Pascal, 3.5-inch drive developed by German Tlers

By MACK McCORMICK

Hello to my many friends all over the world. I wish you all a wonderful New Year. If there is one thing this computer has done for me it is that it has facilitated my meeting hundreds of wonderful people. For that alone I am thankful, plus the creative energy it allows me to expend.

I've spent an entire day answering letters, and this column should answer the remainder. I appreciate your cards and letters with encouragement, questions and suggestions. Keep them coming but please understand that I can't always give a personal reply.

I've had many requests for the source of the German TI-REVUE magazine. You may order it from TI Revue, Abo-Service, Postfach 1107, 8044 Unterschleissheim, West Germany. The cost in Germany is 66 marks which is approximately $34 at today's rate. This is an excellent magazine, though I do not recommend it if you can't read German. I recommend you write the editor, Heiner Martin, prior to ordering.

ALPHA LOCK

I've had many folks ask why the alpha lock key must be up to use the joystick. This is due to the way the TI99 decodes the keyboard matrix. If you're interested I'll provide a complete tutorial in the future. Anyway, if you'll add a simple 1N4148 diode as shown in Fig. 1 you'll never have to worry which position your alpha lock key is in. This modification involves opening the console and soldering the diode into keyboard line 6 which connects to pin 20 of the 9901 chip. Be careful, polarity of the diode is important.

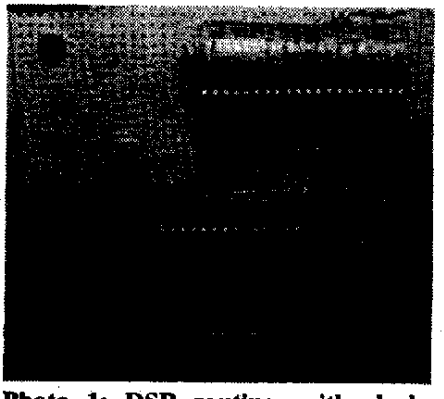

Photo 1: DSR routines with clock, PIO, RAM or EPROM.

THINGS TO COME

I've enclosed six photos to whet your appetites for things to come.

Photo 1 shows the prototype board for the DSR/Clock card. It's been fully tested now and works fine. This will be my feature article for next month. With this card you can write your own DSR routines and have the time/date on command. The final version will be on a printed circuit board. This card was inspired by a German friend, Werner Volker, who handed me a clock chip and asked me to do something with it. If enough people build this circuit I'll write a series of DSR routines to do a number of neat things, maybe even date stamping your disk files as they're created. Heat up your soldering irons!

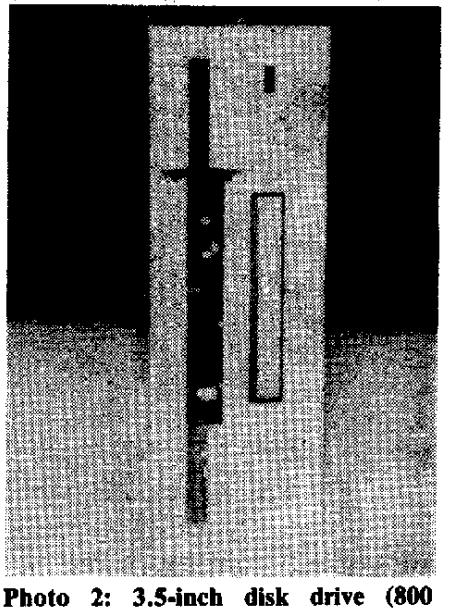

Photo 2: 3.5-inch disk drive (800 kilobytes, 80 tracks, 2880 sectors).

Photo 2 shows a new 3½-inch disk drive. It is quiet and fast. I like the feel of the new hard case diskettes. They include 80 tracks and 2880 sectors using the MYARC disk controller. You can interface it just like a normal 5¼-inch disk drive. A neat little gadget.

Photo 3 shows the speech synthesizer with the slow motion device as described in the December 1986 MICROpendium.

(See Page 26)

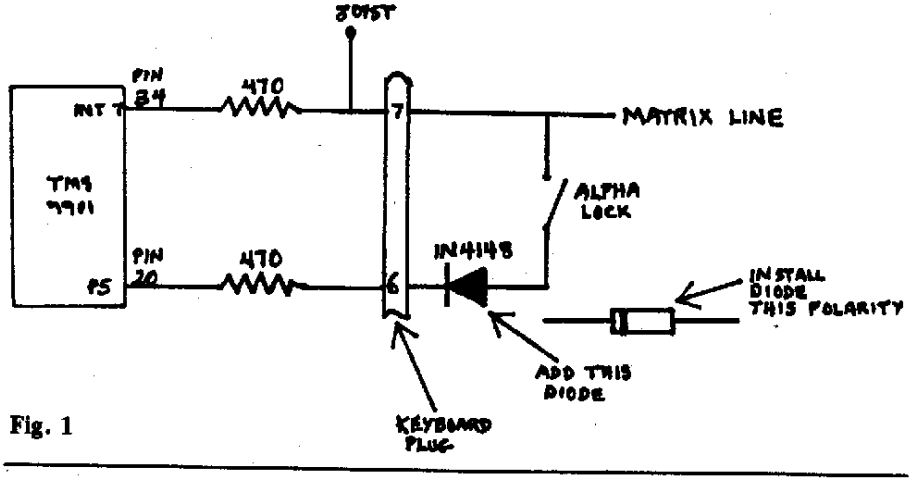

Fig. 1

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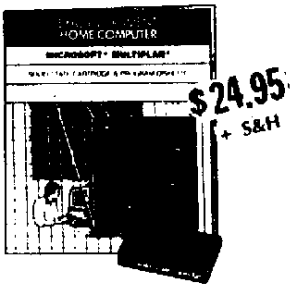

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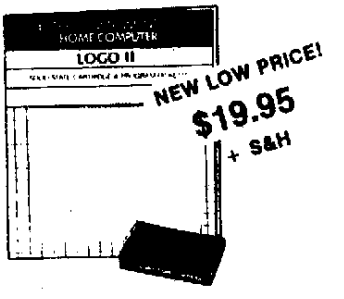

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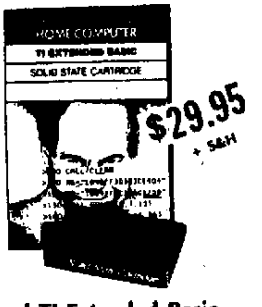

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TECHIE CORNER—

(Continued from Page 24)

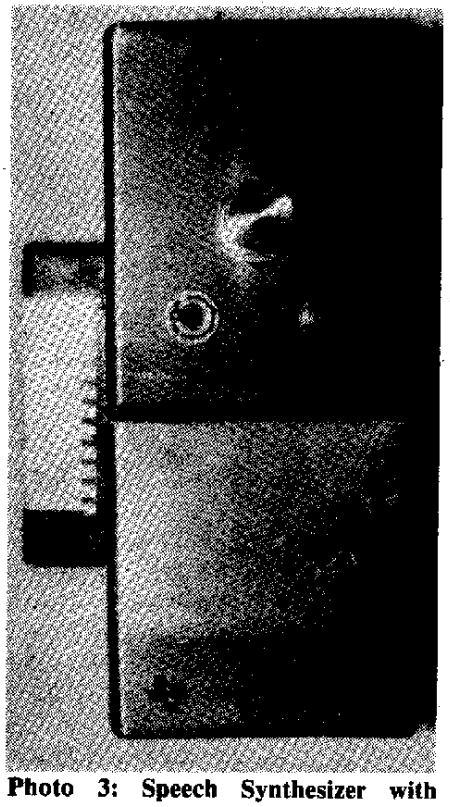

Photo 3: Speech Synthesizer with on/off switch, freeze button and speed control knob.

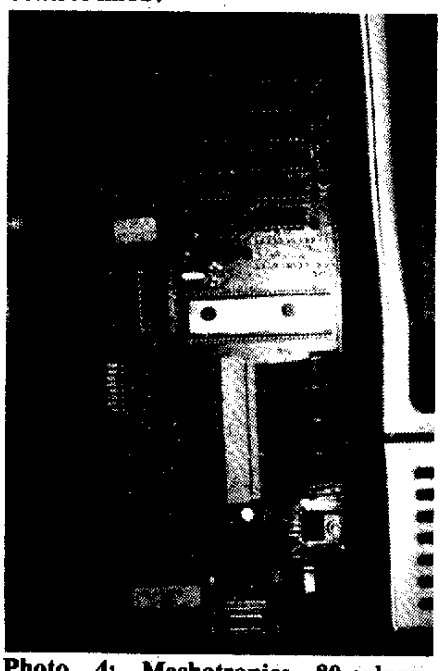

Photo 4: Mechatronics 80-column card.

Photo 4 shows the new Mechatronics 80-column card. I should have the review completed for the March 1987 issue. Initial testing indicates it is outstanding! Gotta buy my new RGB monitor tomorrow (ugh!). I just bought one a year ago (sigh). I'll try to take a few pictures of the screen to show off its resolution.

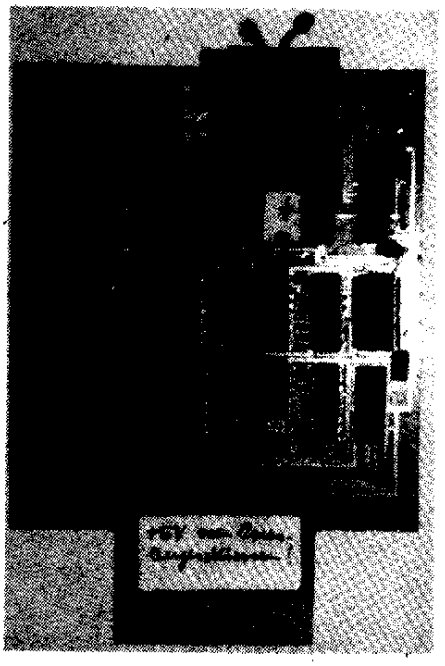

Photo 5: Mechatronics EPROMer. Programs EPROMs up to 27128.

Photo 5 shows the Mechatronics EPROM programmer which will handle EPROMs up to 27128. It is an excellent piece of hardware with a good software driver. I'll review it in the future. If you're looking for an EPROM programmer you'll want to give this one some consideration.

Finally, Photo 6 is the GROM emulator with ROM at address 6000. This is the basic version using EPROMs which will emulate any cartridge. I have another version which will emulate multiple GROMs through RAM chips similar to a GRAM Kracker. It will also provide the Review Module Library function. This may be good news given the recent announcement by MG that it is discontinuing the GRAM Kracker (one of the two best pieces of hardware I own). I plan a complete article in two months.

PASCAL ON DISK

I'm having a blast learning to use the

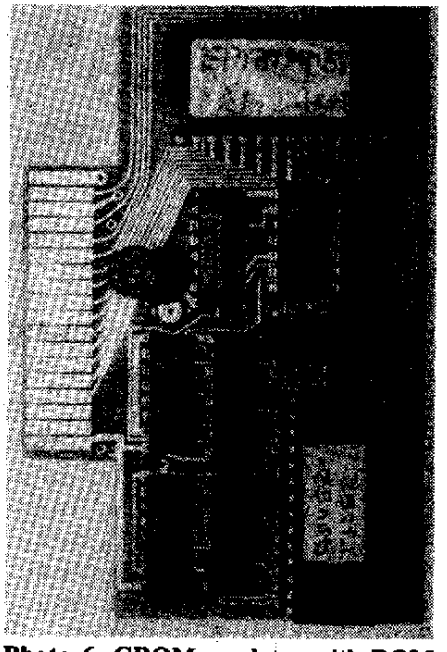

Photo 6: GROM emulator with ROM at address 6000. Can be set up for RAM loading.

German Turbo PASCAL. I've never owned a P-Code card so this is a real treat for me. It is an excellent programming language for the TI and well-documented in German. I'll be contacting the author to ask if he is willing to translate to English. This program far surpasses the capability of the P-Code card, according to one of my most trusted German friends who is a world-class programmer. If we can get the docs translated to English (so the program will be meaningful to those who don't read German) I'll do a complete review.

CONTEST WINNER

We had a programming contest several months ago as a part of the assembly language tutorial series. I received many super entries and my only disappointment is there can be only one winner. My congratulations to Ray Price of Ceres, California, for his excellent submission. Price will receive a free one year subscription to MICROpendium. Honorable mentions go to Ed Schaum of New York, New York, E. Benton of Fairfield, Maine, and Jesse Slicer of Aganam, Massachusetts. For all the others I

(See Page 27)

TECHIE CORNER—

(Continued from Page 26)

hope the experience provided some reward.

LETTERS FROM READERS

Ted Yaffe of Potomac, Maryland asks where to obtain schematics for the TI99 and expansion cards, how GROMs work, how to simulate GROMs, and how to inspect console memory using a basic console. He adds that he has already replaced the console PROM with an EPROM so changes may be easily made.

Schematics for the TI-99 and expansion cards may be obtained from TI-Dealer Parts, P.O. Box 53, Lubbock, TX 79048, for $2 each. The complete set is $18.

Think of GROMs as sequential memories where each byte comes into view through a port. This port may me set to any address in the GROM. Every time you read a byte the address is automatically incremented by one. This is described on pages 270-272 of the TI Editor/Assembler manual. Basically, the GROM write address is at 9C02 and the address is set by writing the MSByte first followed by the LSByte of the address to read. You can then read the data from address 9800. Each byte of data will be sequentiality presented.

There are three ways I know of to simulate GROM so you may write your own GROM programs. First and best is the MG GRAM Kracker, secondly is the Mechatronics GRAM Karte, and third is my GROM simulation module for which I will publish construction plans in two months. Each of these devices allow you to modify GROM.

The only way I can think of to inspect the contents of memory of your basic console with no PEB is through the use of additional memory. Two immediate simple solutions come to mind. First, build a Super Cart like my GROM emulator and then load DEBUG or SBUG to read the memory. The second is to use my DSR routine card and load your debugger there. Both methods require some hardware and software experience but you should be able to handle that if you can replace your console PROM. Of course, a Mini-Memory cartridge would do it also.

Merle Vogt of Von Ormy, Texas asks how to understand the data from the GROM chips.

This data is actually a programming language called Graphics Programming Language (GPL) which TI developed to maximize features of the TI99/4A, such as sound, sprites and video. The only programming guide I know of is proprietary but you can find a good book on the subject by Heiner Martin called the TI99/4A Intern. This volume briefly lists the GPL language and has a fairly accurate, documented listing of the console GROM and ROM

(See Page 28)

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TECHIE CORNER—

(Continued from Page 27)

chips. With this book you can study the workings of the GPL interpreter, which is written in 9900 machine code at CPU address 004E-129E and interprets each byte of GPL.

For a good GPL disassembler I recommend the German version by Michael Weyand. TI Intern and GPL Disassembler and Assembler are available from Ryte Data whose advertisement can usually be found in MicroPendium. One of the best programs for observing the computer execute GPL is MG's Explorer.

Pierre Drouin of Canada asks how to assemble a program that will autostart after loading like a game loader.

First, I'm not quite sure if the question is how to create a program image file or how to auto-start a tagged object file. I'll assume it's the latter. If you have the source code or use a program such as MG's DISkASSEMBLER to create source code the process is fairly simple. Just add the entry point name of your program to the END statement as the symbol name as described on page 234 of the TI Editor/Assembler manual. Of course, the entry point name must be defined in a DEF instruction. Here is an example:

```
DEF START
Enter your program here
END START
```

When you load your program it will start automatically.

You can also directly modify the object code by changing the tag. This is described generally on pages 238-241 of the E/A manual. Find the entry point tag of the program (the 5 tag) and note the four digit address following it. Add a 2 tag to the program followed by the same four digit entry point address. Change the 7 tag (checksum) to an 8 tag, save the program in D/F 80 format using the E/A editor and the program should autostart when you load it. The easiest way to figure this out is to write a short program and study the tags.

Mike Dodd of Oliver Springs, Tennessee, asks for the XML's in Extended BASIC.

Mike Dodd of Oliver Springs, Tennessee, asks for the XML's in Extended BASIC.

First, lets be sure everyone knows what an XML is. An XML is a GPL instruction which tells the GPL interpreter to begin execution of a 9900 machine language program directly. The left nybble specifies which table to get the address from and the right nybble is the branch address in the table (base 0). Upon entry the WS pointer is set to address 83E0. The 9900 program exits with B *R11. See the XB XML tables on the next page.

Richard Frenz of Locust Valley, New York asks why he is having pro-

(See Page 29)

NEW! FROM THE CREATORS OF BANNER '99 AND EXTENDED BUSINESS GRAPHS

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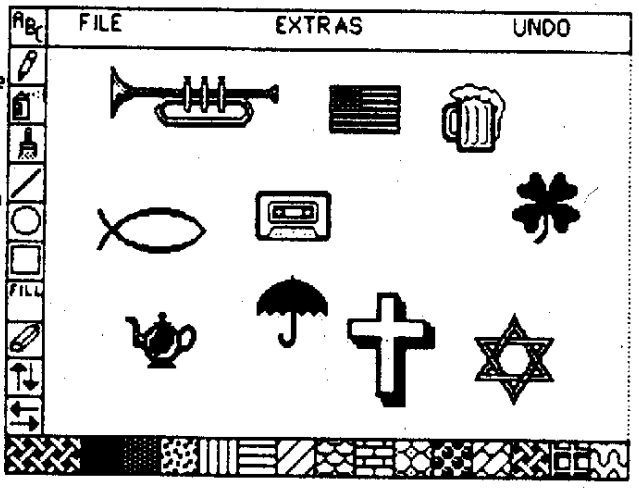
Rated "A" in all areas by MICROpendium! (See August issue!)

Are you still using on of those "other" graphics programs? Why not graduate to a new level of graphics excellence with JOY PAINT? Set yourself free from all those cryptic commands with the only graphics program that is 100% joystick controlled. JOY PAINT '99 hosts dozens of features that the others lack. For instance JOY PAINT has a unique feature called UNDO that allows the user to "take back" the last portion of work! JOY PAINT has a DIRECTORY feature that will catalog your diskettes. JOY PAINT uses joystick controlled tools such as a PENCIL and ERASER and has advanced tools to draw CIRCLES, OVALS, BOXES, and RECTANGLES. You can even SPRAY PAINT in any of the 26 selectable PATTERNS! JOY PAINT comes with hundreds of ready made graphics to get you started! REQUIRES: TI-99/4a, 32k, disk drive, joystick and one of the following: Ext-Basic, ED/ASSM Mini-Mem or TI-WRITER. $39.95 POSTPAID!



GREAT LAKES SOFTWARE

804 E. Grand River Ave., Howell, MI 48843

TECHIE CORNER—

(Continued from Page 28)

blems since he added his second disk drive.

If you have all the DIP switches set properly and the ribbon cable to the drives is good then you probably do not have the resistor pack termination for the drive installed properly. On most drives, such as the TEAC 55B, this is a small blue device which looks like a chip located near the board connector. If you are running two drives this pack must be in drive 2 and the pack in drive one removed. If this doesn't solve your problem write back with specific symptoms, type drives, etc. and I'll try to help further.

John Pettit of Pasadena, California, asks how he can convert ASCII files in CP/M or MS-DOS format to TI format.

The easiest way would be to transfer the files between the RS232 port of an IBM computer and your computer. Otherwise, you can modify the disk access tutorial I wrote for MICROpendium to read a track and then write the track back out in TI format. This requires advanced knowledge of disk controllers and disk track format as well as considerable programming skill. In any case, both methods will work.

Robert Bouchard-Hall of Norton, Massachusetts, asks how to prevent computer lock-ups, especially when using Extended BASIC.

This is usually caused by dirty contacts. I recommend purchasing a good aerosol cleaner such as used to clean tape heads. Be certain it doesn't contain oil. Clean the contacts on all cartridges and the cartridge port using a business card as a brush. Open the console and remove the L-shaped cartridge port connector and clean the connector on the computer mother board. As long as you've gone this far I recommend removing the metal shield from the mother board and replacing the heat sink compound on the VDP chip. This compound my be purchased at Radio Shack. When this chip overheats the computer will also lock up.

Well, I've covered a lot this month in Techie Corner. Lots of exciting projects and software are coming up. (For those who have asked for windowing routines, such as those used in TI-Writer, that's coming up soon.)

Until next time, "Assembler Executing."

```
+-------------------------------------------------------------------------+
|>6010    |  XML Table 7 start address in standard XB cart.               |
|  >6010  |  COMPCG  GPL entry for compact to take advantage of common code |
|  >6012  |  GETSTG  GPL entry for get string routine.                    |
|  >6014  |  MEMCHG  Checks to see if room available to insert a symbol table |
|         |          entry or PAB into VDP.                               |
|  >6016  |  CNSSEL  Selects page 2 and converts number to string.        |
|  >6018  |  PARSEG  GPL entry to parse.                                  |
|  >601A  |  CONTG   GPL entry for continue parse routine.                |
|  >601C  |  EXECG   GPL entry to execute one or more lines of BASIC.     |
|  >601E  |  VPUSHG  GPL entry point to push a variable into VDP.         |
|  >6020  |  VPOP    Routine                                              |
to
POP the VDP stack.                                                        |
|  >6022  |  PGMCH   GPL entry point to get the next character.           |
|  >6024  |  SYMB    GPL entry to put symbol name in FAC and find entry   |
|  >6026  |  SMBB    GPL entry for find pointer to var space of each symbol |
|         |          table entry                                          |
|  >6028  |  ASSGNV  Entry for assign numeric variable.                   |
|  >602A  |  FBSYMB  BASIC symbol table entry for GPL.                    |
|  >602C  |  SPEED   Routine to speed up XB execution.                    |
|  >602E  |  CRNSEL                                                       |
Selects
      page two of ROM and performs a crunch.                              |
|>6030    |  XML Table 8 start address in standard XB cart.               |
|  >6030  |  CIF     Convert integer to floating routine.                 |
|  >6032  |  CONTIN  Routine to continue after a breakpoint.              |
|  >6034  |  RTNG    Routine to return to GROM execution.                 |
|  >6036  |  SCROLL  Routine to scroll the screen one line.               |
|  >6038  |  IO      Routine to decode which I/O utility is being called. |
|  >603A  |  GREAD   Routine to read data from ERAM to CPU.               |
|  >603C  |  GWRITE  Routine to write data data from CPU to ERAM.         |
|  >603E  |  DELREP  Routine to delete text in a crunched program.        |
|  >6040  |  MVDN    Move contents of RAM down. If ERAM not present then VDP. |
|  >6042  |  MVUP    Move contents of RAM up. If ERAM not present then VDP. |
|  >6044  |  VGWITE  Move data from VDP to ERAM.                          |
|  >6046  |  GVWITE  Move data from ERAM to VDP.                          |
|  >6048  |  GREAD1  Routine to read data from ERAM.                      |
|  >604A  |  GWITE1  Routine to write data from CPU to ERAM.              |
|  >604C  |  GDTECT  Determines the amount of expansion RAM present.      |
|  >604E  |  SCAN    Main looping structure of the prescan routine.       |
```

Techni-Graphics updates PC-Keys

Techni-Graphics has released version 2.0 of its PC-Keys program, a program giving the TI99/4A programmable control keys.

The new version retails for $23.99 plus shipping and handling charges of $1.50, according to Jim Kryzak of Techni-Graphics.

The new version features a new utility menu; an 11-digit display calculator which uses a windowing feature, allows the user to add, subtract, multiply, divide and compute square roots, and has a memory key; a disk catalog which now uses a windowing feature and allows the option of printout to a printer; a note pad with a windowing feature which can be output to printer; and a setup utility program for such functions such as to set output device, edit keys 1-9 and change screen color.

For further information, or to order, contact Techni-Graphics, 1058 Perda Lane, Des Plaines, IL 60016-5724.

—First of 3 parts—

Get more from TI-Artist with XBII

BY J. PETER HODDIE

One of the most obvious and exciting features provided by Myarc's Extended BASIC II is the ability to create bit map graphic screens from BASIC.

Some things are still too painful to write in BASIC: for example, a routine to draw a detailed picture of almost anything. Using dot, line, box, circle, and fill commands to create graphic images is tedious at best. However, the TI community is fortunate enough to have available several excellent drawing programs, including TI-Artist. The two subroutines presented in Listing 1 provide a method for loading TI-Artist screens into Extended BASIC II, and for saving XBII screens in TI-Artist format. And because TI-Artist contains the ability to interface with other popular drawing programs, including GRAPHX, Draw 'n Plot, Draw-a-Bit and others, you can essentially transport complete graphic screens between XBII and your favorite drawing program.

The routines are simple to use. To load a picture just enter the following without the __P and __C suffixes that TI-Artist uses. They will be supplied automatically.

```
CALL LINK("LOAD","DSK1.PICTURE")
```

To save a picture, enter:

```
CALL LINK("SAVE","DSK1.PICTURE")
```

To use either routine, you must be in bit map mode.

When you try out these routines, you will notice that you can actually see the graphics loading. This may not be desirable in certain situations so two more simple CALLs have been provided to turn the screen on and off. To turn the screen OFF use:

```
CALL LINK("SCROFF")
```

To turn it back on use:

```
CALL LINK("SCRON")
```

Note that when the screen is turned off all that you will see is the background color.

Besides being a convenient method

(See Page 32)

Listing 1

```
     DEF LOAD,SAVE
     DEF SCRON,SCROFF

     REF VMBW,VMBR
     REF VWTR
     REF DSRLNK
     REF STRREF

WS   BSS 32        MY WORKSAPCE

PABDA1 DATA >0500,0,0,>1800,>000D  A PAB TEMPLATE
     BSS 20        ROOM FOR FILENAME
     EVEN

PAB   EQU >3B80      SAFE PLACE FOR THE PAB

DSRPTR EQU >8356      ADDRESS OF POINTER FOR THE DSR

D19   BYTE 17        A CONSTANT
UNDER TEXT '_'       UNDERLINE CHAR
P     TEXT 'P'
C     TEXT 'C'
D5    BYTE 5         CONSTANT
D6    BYTE 6         CONSTANT
     EVEN

RETURN BSS 2         RETURN ADDRESS

LOAD
     MOVB @D5,@PABDA1  INDICATE THAT THE PAB SHOULD LOAD
     JMP DSR         JUMP TO COMMON ROUTINE

SAVE
     MOVB @D6,@PABDA1  INDICATE THAT PAB SHOULD SAVE
* COMMON ROUTINE FOR LOAD/SAVE
DSR
     MOV R11,@RETURN  SAVE RETURN ADDRESS
     LWPI WS         LOAD MY REGS

     CLR R0          NO ARRAY
     LI  R1,1        PARAMETER #1
     LI  R2,PABDA1+9  WHERE STRING SHOULD GO
     MOVB @D19,*R2    INDICATE MAXIMUM STRING LENGTH
     BLWP @STRREF     GET STRING

     MOVB @PABDA1+9,R9 GET THE LENGTH
     SRL R9,8        MAKE IT A WORD
     MOV R9,R10      MAKE A COPY
     AI  R9,PABDA1+10 POINT TO CHARACTER AFTER FIENAME
```

(See Page 32)

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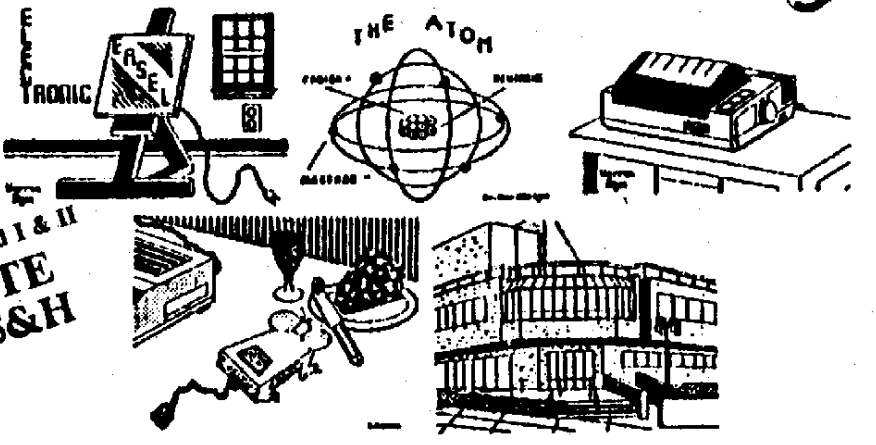

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TI-ARTIST & XBII—

(Continued from Page 30)

of transferring graphic images, these routines also may be used to write a slide show-type program. Listing 2 is a primitive attempt at such a program. It will display every TI-Artist picture on the disk in the drive that is set at line 100. Although this is not a very exciting program, it does give some idea of the potential of such a program.

These routines also could be used to obtain a screen dump of a bit map screen from XBII by saving screens to disk, loading them into TI-Artist (or MAX-RLE by Travis Watford) and then printing them from that program. However, next month I will present a routine to do a straight screen dump without having to go through another program.

To use these routines, first type in the code given in Listing 1 and save it to disk with the filename DSK1.ARTLOAD/S. Next, enter the

(See Page 33)

(Continued from Page 30)

```
      INCT R10        ADD 2 TO FILENAME LENGTH
      SWPB R10        PREPARE TO PUT LENGTH IN PLACE
      MOVB R10,@PABDA1+9    PUT LENGTH BYTE IN PLACE IN PAB

      CLR @PABDA1+2
      MOVB @UNDER,*R9+ COPY THE UNDERLINE INTO PAB
      MOVB @P,*R9      AND THE P
      BL  @FILE        AND LOAD THE "PICTURE" FILE

      LI  R0,>2000
      MOV R0,@PABDA1+2
      MOVB @C,*R9      CHANGE THE P TO A C
      BL  @FILE        AND LOAD "COLOR" FILE

EXIT
      LWPI >83E0       RESTORE GPLWS
      MOV @RETURN,R11  GET RETURN ADDRESS
      RT               RETURN TO BASIC

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

FILE
      LI  R0,PAB       ADDRESS OF PAB IN VDP
```

(See Page 33)

Artist Instances

Now! for users of *TI-Artist* and *Font-Writer*! The most extensive, complete library of instances ever produced, exclusively from ***Asgard Software.*** Each single disk volume in the ***Artist Instances*** series is a valuable collection of highly-detailed instance clipart for use in any graphics project. Each individual volume is fully documented with explanatory notes and usage tips for *Font-Writer* and *TI-Artist* users. Each collection contains only the best artwork individually culled from hundreds of files and arranged by subject matter. Finally, each volume is available for an incredible price of only $9.00 each!

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TI-ARTIST & XBII—

(Continued from Page 32)

Assembler and give a source file name of DSK1.ARTLOAD/S, object file name of DSK1.ARTLOAD, hit ENTER for the list file, and enter RC for options. When the Assembler is done you can then start up XB II and do a CALL INIT, followed by a CALL LOAD("DSK1.ARTLOAD") to bring the routines into memory.

If you don't want to type the code in or don't have access to an assembler, you can obtain the source code, object code, and demo program by calling BCS TI99 BBS No. 2 at (617) 335-8475 or you can get a disk with the material by sending $3 to Boston Computer Society, TI99 User Group, One Center Plaza, Boston, MA 02108.

Listing 2

```
50 DEFINT ALL
60 DIM P$(50) ! ROOM FOR 50
PIX
70 DELAY=1500 ! DELAY TIME B
ETWEEN PICTURES
90 GOSUB 500
100 D$="DSK2." ! DEVICE TO R
EAD CATALOG FROM
110 OPEN #1: D$, INPUT ,FIXE
D ,RELATIVE ,INTERNAL
120 INPUT #1: A$,B,C,D
130 INPUT #1: A$ :: IF POS(A
$,"_P",1)=LEN(A$)-1 THEN Z=Z
+1 :: P$(Z)=D$&SEG$(A$,1,LEN
(A$)-2)
135 IF A$<>"" THEN 130
140 CLOSE #1 :: IF Z=0 THEN
STOP
150 CALL GRAPHICS(3)
200 FOR X=1 TO Z
210 CALL LINK("SCROFF") :: C
ALL LINK("LOAD",P$(X)) :: CA
LL LINK("SCRON")
215 FOR Y=1 TO DELAY :: NEXT
Y
220 NEXT X
230 GOTO 200
500 CALL GRAPHICS(1) :: CALL
 CLEAR
510 DISPLAY AT(10,1) : "  T
I-Artist Picture Show": "
 By J. Peter Hoddie": "
    For MYARC XB II"
520 RETURN
```

(Continued from Page 32)

```
    LI  R1,PABDA1   THE PAB TEMPLATE IN CPU
    LI  R2,32       ABOUT 32 BYTES
    BLWP @VMBW      MOVE PAB TO VDP
    LI  R0,PAB+9
    MOV R0,@DSRPTR  TELL DSR WHERE PAB IS
    BLWP @DSRLNK    LOAD/SAVE THE FILE
    DATA 8
    RT          RETURN TO CALLING ROUTINE

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

SCRON
    MOV R11,@RETURN  SAVE RETURN ADDRESS
    LWPI WS         LOAD MY WORKSPACE
    LI  R0,>01E0    TURN SCREEN ON DATA
    JMP SCREEN      COMMON ROUTINE


SCROFF
    MOV R11,@RETURN  SAVE RETURN
    LWPI WS         LOAD MY WORKSPACE
    LI  R0,>01A0    TURN SCREEN OFF DATA
SCREEN
* COMMON ROUTINE
    BLWP @VWTR      WRITE DATA TO VDP REGISTER
    SWPB R0
    MOVB R0,@>83D4  TELL KSCAN THAT WE MADE THE CHANGE
    B   @EXIT       AND RETURN TO BASIC

    END
```

Reviewed in MICROpendium

1984

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

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

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

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

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

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

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

September: Wycove Forth, 99/4 Auto Spell-Check, QUICKCOPYer, Wizard's Dominion, Anchor Automation Mk XII Modem

October: Killer Caterpillar, ZORK I, Defender

November: 9900 Disk Controller Card/Manager, Super Bugger, Transtar 120S printer, Floppy-Copy, Data Base-X

December: Gravity Master, Data Base Manager System, Learning 99/4A Assembly Language Programming

1985

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

February: Super Extended BASIC, Beginning Assembly Language for the TI, ZORK II

March: Morning Star Software CP/M Card, WDS/100 Winchester Disk Drive, Sketch Mate, BMC Color Monitor

April: 9900 Micro Expansion System, Disk+Aid, Gemini 10X-15X

May: Character Sets and Graphics Design, Draw 'N Plot

June: GRAPHX, DATA BASE I

July: Acorn 99, Advanced Diagnostics

August: Model Dow-4 Gazelle, TI-Artist, PC-KEYS, Not-Polyoptics' Bankroll

September: Midnite Mason, Myarc 32K/128K Card, GRAPHX Companion

October: 4A/TALK, Extended BASIC II Plus, XB Detective, Console Writer 2.1

November: Foundation Z80A/80-column cards, 9900BASIC, Adventure Editor

December: Display Enhancement Package, Triple Tech

1986

January: BITMAC, Starcross

February: Night Mission, Peripheral Diagnostic Module, BA-Writer

March: Super Duper, Tunnels of Doom Editor, Business Graphs 99

April: U.S. Open Tennis, PRBASE

May: 4A Flyer, GRAM Kracker, Artist's Companion

June: Myarc Disk Controller Card, Maximem

July: Horizon RAMdisk, Old Dark Caves, Funlwriter, TI99/4A Macro Assembler

August: JOYPAINT 99, GPL Assembler, TI99/4A INTERN, GPL Linker

September: Mechatronic 128K card

October: TI-Forth Utilities, CorComp Memory Plus

November: Submarine Commander, PEP, MAX-RLE

December: GK Utility I and II and GRAM Packer, X-10 Powerhouse, RAVE 99/101.

1987

January: MG DISkASSEMBLER, Myarc XBII.

Freeware

Freeware policies

The Freeware page is a periodic feature of MICROpendium. MICROpendium makes no claims as to the validity of any Freeware offer, nor is there any guarantee that any software will be suitable for any purpose.

FREEWARE REQUIREMENTS

- Disks sent for freeware must be initialized;
- Unless otherwise stated, include a stamped, self-addressed return mailer to receive the Freeware;
- Be patient, those offering Freeware are not doing it for a profit;
- Report any problems you have to MICROpendium.
- To encourage continued development of user-supported software we suggest including a donation of $3-$10 for Freeware.

FREEWARE ANNOUNCEMENTS

Anyone wishing to have a Freeware announcement included on this page may do so by submitting a copy and brief description of the program, and a note indicating that it is in the public domain, to MICROpendium.

The complete MICROpendium Freeware listing is available for $1.50 from MICROpendium. The list is updated quarterly.

EE BONDMASTER UPDATED

EE Bondmaster calculates the value of government series EE bonds issued after November 1982, including those bonds issued after the recent change in minimum interest in November 1986. Maintains a database of bond serial numbers, purchase prices, issue dates and government-announced variable interest rates (announced every November and May). Makes replacing lost or stolen bonds a snap. Computes values using variable interest rates for bonds five years or older. Send blank, initialized disk with return mailer and postage to: Real Estate Projections; 409 Elberon Ave., Suite 2; San Pedro, CA 90731.

TEXNET NO LONGER AVAILABLE

The Texnet network on The Source was discontinued on Jan. 30. Freeware is no longer available on the network. However, TISIG has replaced Texnet for TI Source users and includes a database of more than 100 programs available for free downloading by Source subscribers.

ADDRESS & TELEPHONE FILER

This program is used to keep track of names, addresses and telephone numbers. It includes an on-screen help function as well as a disk cataloger that lists addresss and telephone files. Also included are a sort routine and the capability to search on any field. A six-page manual is included. The program consists of 16 files totaling 162 sectors. It requires Extended BASIC and a disk system. A printer is optional. (It may be used to print mailing labels).

Send $7.50 to Walter R. Davies; Gator Software; 17718 Orchard Lane; Salinas, CA 93907.

MULTIPRINT COMMAND FILE

This program is used to insert printer commands anywhere on a spreadsheet created with Microsoft Multiplan. It supports a number of printers, including Epson and Epson-compatibles, Gemini 10 and 15X, Star Micronics SG-10, Seikosha GP-550A and Gorilla Banana, C. Itoh Prowriter and Okidata. The authors will create a command file for other printers if the user provides a listing of printer commands. Documentation is on the disk. Send disk, postage and return mailer to Jack and B.J. Mathis; 5941 E. 26th; Tucson, AZ 85711. A donation of up to $10 is requested from those who use the program.

NUTRIGUIDE

This program is used to provide data concerning the nutritional content of various foodstuffs. It may be used to analyze the nutritional value and content of individual food items, recipes or entire meals. Factors analyzed include calories, protein, carbohydrates, fat, cholesterol and sodium. The program calculates the amount of these items in particular foods and provides a breakdown of their values based on the size of the serving. The user may readily add food items to the database. (The data base uses grams as the unit of measure.) Nutriguide requires Extended BASIC and a disk system. A printer and speech synthesizer are optional. Although an expansion memory is recommended, it may be used on a limited basis with 16K. A printer manual is included.

Send a disk, return mailer and postage to Paul Meadows; 321 Iony Hill; Lr. Sackville, Nova Scotia; Canada B4E 1M6. A donation of $5-$10 is requested.

SUPERDIAL

This standalone program may be used to dial a phone using a modem. It may be used to dial via PC Pursuit or locally. The user may enter up to ten telephone numbers to be dialed on a rotary basis. The entire list may be repeated as many times as desired. (Using PC Pursuit, up to 10 3-digit area codes may be entered.) When a connection is made, a tone is sounded and the user may then load a terminal emulator or other program. (For example, Superdial may be used to call a remote computer and after a connection is made the user may load TI-Writer to send a text file using the Print File option.) The program includes a copy of Paul Charlton's Fast-Term terminal emulator. Superdial requires a modem, Extended BASIC, expansion memory and a disk system.

Send a disk, postage and return mailer to: Roger Davis; 11410 Grovedale; Whittier, CA 90604. A $5 donation is requested by users.

FAST-TERM AUTO-DIALER

This 23-sector program is designed to be used with the Fast-Term terminal emulator. The program includes Fast-Term and a LOAD program that automatically loads the Auto-Dial program. Documentation is on the disk.

After loading the Auto-Dialer, the user has the option of

(See Page 35)

Freeware

(Continued from Page 34)

entering BBS phone numbers into the database (up to 20 may be included), loading Fast-Term, dialing a number from the BBS list, dialing manually or changing the initial communications parameters. In normal use, the program is used to call a BBS from the listing of phone numbers. After a connection is made the user loads Fast-Term from the Auto-Dial menu screen.

Send a diskette and $2.50 to cover postage and mailer to Dave Johnson; 2109 Pullman Circle; Pensacola, FL 32506. A $5 donation is requested from those who use the program. The program is also available via the author's BBS. The 24-hour, 7-day a week board may be reached at 904-453-4667. It operates at 300 and 1200 baud.

XBASIC TOOLS

Extended BASIC Tools contains a group of utilities useful to those who write programs in Extended BASIC or BASIC. System requirements are Extended BASIC, expansion memory, disk system and RS232.

XB Tools programs area used to extract or modify data of programs saved in a MERGEd format. The utilities offer the following capabilities: creation of a list of key items and a reference list for each item; a compression facility designed to reduce the size of a program; changing of names of as many as ten variables at a time; deleting, moving or resequencing of blocks of program lines; combining of DATA lines for greater efficiency; and printing of the line lengths of program lines, as well as line contents if desired. Documentation is included on the disk.

Also included on the disk are a program that prints a chart of all ASCII codes, their characters, hex value and TI BASIC tokens; a program to test printer compatibility; and a multipurpose disk cataloger, program RUNner and file printer.

Send $6 per copy ($7.50 in U.S. funds for Canada and other countries) to: Jim Swedlow; 7301 Kirby Way; Stanton, CA 90680.

CREATIVE FILING SYSTEM

This data manager program consists of two disks and requires Extended BASIC, memory expansion and a disk system. Optional equipment includes a printer, multiple disk drives and Foundation Computing's 128K card. The program is compatible with the Myarc and Horizon RAMdisks.

This comprehensive data manager allows the user to create up to 16 fields of data with a limit of 28 characters per field. Multiple files may be stored on a single disk. With CFS, users may display records based on user-specified criteria, append to files, serach files using user-defined conditions, change individual records or entire files, sort user one or two keys and create graphs using data from numeric fields.

Other features include a global change option, sub-files based on user-defined criteria, ability to convert data base files to D/V 80 format for use with TI-Writer, mathematical operations via a report generator and formatter program, ability to print columnar reports with automatic column spacing and a built-in disk catalog program to locate CFS-created files and more. Extensive documentation is included on disk

Send two disks, return mailer and postage to: Mark Beck; 166 Delaware Cir.; Jacksonville, AR 72076. A donation of $10 is requested.

FAS-TRAN UPDATED, AND MORE

Bill Harms has updated is FAS-Tran checkbook recapper program. New options include the ability to accomodate any printer for compressed or elite fonts and ability to print checkbook data from selected periods.

Harms is also offering four other programs: Window Calculator, a 10 key-like calculator that may be merged into another program or used by itself; TI-Writ-Mail, a filing system that used the TI-Writer editor for simple database applications; Printer-Bosser, a group of subprograms to set printer codes; and Screen-Maker, a block graphic, screen designer/printer program. All have documentation on the disk.

Send $5 for the four programs to Bill Harms; 6527 Hayes Ct.; Chino, CA 91710.

SEGREGATION, FLIP-FLAP

Segregation is a is an Extended BASIC game in which the

(See Page 36)

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- Adds CALL Subprograms to BASIC to: 1) set the drive number, 2) set write protect, 3) set maximum sectors, 4) enable DSR for direct access, 5) execute M/L code from BASIC. DELETE "XBCALL" downloads CALLs to low 8K for execution from running Ext BASIC programs
- Comes with complete DSR SOURCE CODE. Explains how to write A/L CALL routines to enhance TI BASIC.

HORIZON COMPUTER LIMITED
P.O. Box 554
Wellbridge, Ohio 43465

Freeware

(Continued from Page 35)

user is required to "integrate" and then "segregate" 20 boxes. The author, Chris Lang, describes it as a 20-sided Rubik's cube-type puzzle. Segregation is available on diskette or cassette.

Flip-Flap, Fact-Filled, Floppy-File Fun Folders is an Extended BASIC utility that allows users to print a disk catalog on its own printer-made disk jacket. Features include an array of disk jacket styles, selectable and mixable fonts, disk labels and more. The program requires a memory expansion, disk system.

Send $5 for Segregation, $3 for the jacket printer, and a floppy diskette for each program (or cassette for Segregation), return mailer and postage to: Chris Lang; 1906 Jackson Rd.; Baltimore, MD 21222.

GAMES OF WIT

Chris Lang is offering his Wit Game Series on three disks. Included are five Extended BASIC, educational, word games for ages 6 and up. They are:

—The Game of Wit, a Scrabble-type game reviewed in the July 1984 edition of MICROpendium;

—Nit-Wit, the object of which is to "trap" letters which are falling though drain pipes by manuevering a stopper plug into the pipes;

—Wit or Wit-Out, a game for 2-6 players the object of which is to form words by adding or subtracting letters from words previously placed on the screen;

—Wittle Tags, a game for 2-6 players the object of which is to form the shortest word possible using randomly generated letters;

—Wit's End, an advanced version of The Game of Wit.

Documentation for the games is on disk. Extended BASIC, a disk system and expansion memory are required. The author asks $10 for the series of games. Send three disks, return mailer and postage to: Chris Lang; 1906 Jackson Rd.; Baltimore, MD 21222.

TAXMASTER '87

This Extended BASIC program is designed to help users prepare their 1987 U.S. income taxes. It includes most of the items from Form 1040 and Schedules A and B. The items appear on the screen in about the same order as they appear on the forms. The program requires Extended BASIC, expansion memory, disk system and printer. It is designed for use with Epson compatible printers but the printer controls may be modified by the user for other printers. The program prints the final tax return using the government's tax form. Send $5 to Howard H. Arnold; 210 Beech Valley Rd.; Lewisville, NC 27023. He will supply disk, postage and return mailer.

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1986 DA-TAX AUDITOR: Federal Income Tax preparation program for TI99/4A for only $19.00. Covers form 1040 and schedule A for itemized deductions. Menu driven, very fast, and extremely easy to use. Pop-up calculator window available at a touch of a key. Saves, loads data, prints the results, and recalculates the form in less than 2 seconds. 15 day money back guarantee, yearly updates and FREE telephone support. Extended BASIC module required. VISA/MC/AmEx/COD ORDERS ONLY call toll free 24hr/day, 7 day/week:

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"The *"Orphan's Survival Handbook"* was both easier and harder to put together than was the 'Orphan Chronicles'. Easier in that it was already written! It is an anthology or material gleaned from literally hundreds of user group newsletters and hundreds of hours of downloaded files from bulletin board systems. It is the "Best of" you—the TI user group members, hackers, programmers, and newsletter editors. Why, then, was it difficult? There was so much quality material available! The hardest thing was not finding enough material, it was deciding what I could leave out!"

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TI-TAX

Put Multiplan to work on your taxes

By JOHN KOLOEN

TI-TAX is a program that I hate to use, but it comes in handy nonethless.

TI-TAX is a collection of templates for Microsoft Multiplan that essentially allow TI users to do federal income taxes on their computers. Not something I like to stay up nights doing, but it's got to get done.

The templates were developed by William G. Chavanne and come in a collection of four single-sided, single-density diskettes. Each template is a character by character copy of the familiar (and some unfamiliar) income tax forms. The disks are available separately. Disk names are Shortforms, Shareform, Schedules and Otherforms.

Shortforms, $19.95, consists of the following templates: Form 1040A, Form 1040EZ, Form W4 and Schedule 1. Documentation is included on disk along with a flow chart.

Shareform, $9.95, includes Form 1040, a template called Figuretax that includes Schedules X, Y, Z and G, a flow chart and documentation.

Schedules, $19.95, includes Schedules A, B, D, E and W. It uses documentation from the Shareform disk.

Otherforms, $19.95, includes Form 1040X, Form 2106, Form 2441, Form 3903, Form 6251 and Form W4.

Performance: The power of Microsoft Multiplan lies in its templates. And as far as federal income taxes are concerned, these templates release the power of Multiplan. I've been working with the entire set of templates and have been able to complete most of my tax form. (The only template not available with the set I have is Form 4562 which relates to depreciation and amortization. Mr. Chavanne says he is willing to incorporate templates not available in the current set for a fee of $25 per page. If he already has the form designed he'll provide it for $7.50 on a user-supplied disk or for $10 if he supplies the disk.)

Review

Report Card

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

Cost: from $9.95 to $19.95 per disk (four disks in entire set)
Manufacturer: William G. Chavanne, 4559 English Ave., Fort Meade, MD 20755; 301-672-1980
Requirements: Microsoft Multiplan, disk system, expansion memory and a printer capable of printing 17 characters per inch

Just as Form 1040 requires information from other forms, the TI- Tax 1040 is linked to these other forms using the Multiplan eXternal command. This allows the user to enter the data exactly where he'd enter it using the actual income tax forms, with most of the calculations being done automatically. There is even a template that uses a Lookup table to figure tax rates using Schedules G, X, Y and Z. However, because of its large size, the Tax Table used by most taxpayers is not included as a template.

TI-Tax is basically a computerized version of federal income tax forms and thus the best manual to have on hand when using TI-Tax is the Federal Income Tax Forms and Instructions booklet.

Limitations of TI-Tax are the limitations of Multiplan. It's a bit slow and one has to do a lot of windowing to get from the beginning of an instruction line to the end. (This would be the case even on an 80-column display since the federal tax forms are wider than 80 columns). One has several options to speed things up, among which are moving from one unlit cell to the next. I found that placing the cursor on the right side of the form and reading down the form was the best and fastest

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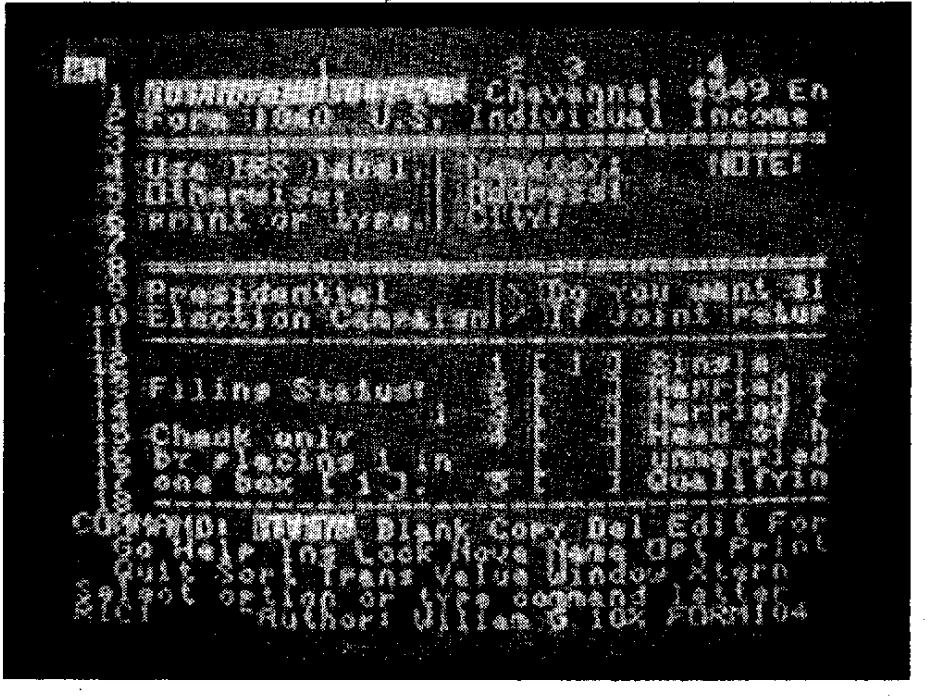

TI-TAX—

(Continued from Page 37)

way to finish the form. (Turning off the recalculation option also helps.) Of course, you must use the actual tax forms as a guide, but you'd be doing that whether filling them out on a computer or on the kitchen table.

Although some of the forms read data from several linked sheets, I did not find loading procedure to be lengthy. Those with single-sided, single-density disk controllers will have to take care in making sure the various linked templates are available to be read. A DS/DD controller will speed things up in this regard and allow virtually all the forms to reside on one drive. A RAMdisk may also come in handy, and a user with a hard disk will glad he's got one.

As far as the actual calculations go, I could not find any errors in the formulas used in TI-Tax, and I used most of the forms.

Ease of Use: I gave TI-Tax a "B" in this regard because of the difficulty one has in moving from place to place on the template. This is due to the limitations of Multiplan and the 40-column display more than the templates.

Documentation: The documentation is filled with disclaimers and warnings about making sure to use the federal income tax booklet as a guide. I think it repeats these caveats far too often and could have been reduced in size by a half without losing anything. Aside from a couple of introductory pages about how to use Multiplan the documentation is much ado about nothing.

Value: Why do your taxes on a computer? My experience is that it takes me several tries to get it right, and the value of TI-Tax is that I can change as many entries as often as I want and it will automatically recalculate the entire tax form. I can do some "what-iffing", which could come in handy in planning for next year's taxes, and if you get really conscientious (I know I won't do this) you can input the tax data as it comes in and know before the end of the year whether to expect a refund or a payment.

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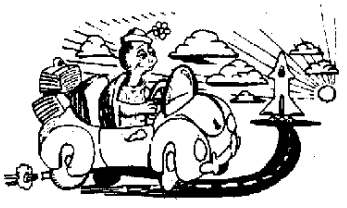

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If you don't already own the 3 previously released USER DISK graphics libraries, you will want to add these to your collection. USER DISK #1 (7 fonts, 3 graphics, 1 picture) sells for $5.95, USER DISK #2 (22 fonts, 86 graphics, 26 pictures) sells for $10.95, and USER DISK #3 (12 fonts, 127 graphics, 27 pictures) sells for $10.95. Please specify printer when ordering.

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Mechatronic TI-Mouse

No squeaks from this input device

By JOHN CLULOW

The Mechatronic TI-MOUSE is a beautifully designed input device for the TI99/4A. It is priced a little lower than similar devices for Apple and Tandy computers and outperforms them in some respects.

The mouse is about the size of a TI command module and has a motion sensing ball on the bottom. When it is moved on a flat surface, the computer generates a corresponding motion on the screen. Two keys on the mouse are used to make menu selections, draw, etc.

Joysticks and trackballs allow motion in one of eight directions. The mouse, on the other hand, provides accurate representation of speed and the full range of possible directions making it the most natural and easy-to-use input device available. Anyone who has been frustrated while trying to use a joystick or trackball with TI-Artist will be overjoyed with the performance of the TI-MOUSE.

The TI-MOUSE cable is plugged into a small interface box which, in turn, connects to the console joystick port. An AC adaptor supplies power to the interface. While the manual suggests an 8x11-inch section of table be available for the mouse, I found that an area of only 4x5 inches was sufficient. A mouse displacement of one inch translates into about 96 pixels on the screen; the minimum movement for full screen motion is about 2.5 inches horizontally and 2 inches vertically.

Three demo programs are provided. An Extended BASIC program displays a pocket calculator on the screen. The mouse moves a hand-shaped sprite to operate the calculator. An assembly language Breakout program shows how the mouse works in an arcade type game. Full source code is provided. The third program is a demo version of Mechatronic's TI-DOS; a disk manager program. The mouse moves an arrow-shaped cursor for icon selection of various disk functions.

Review

Report Card

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

Cost: $99.95
Manufacturer: Mechatronics GmbH, West Germany; distributed by T.A.P.E. Ltd., P.O. Box 4042, Ontario, CA 91761.
Requirements: console, memory expansion, disk system.

These examples illustrate how to include mouse routines in user-written programs. This is easy to do with the software provided. Loaded with a CALL LOAD statement, a program called MOUSE allows access to the device in Extended BASIC programs. Sprite number 1, used by the MOUSE program, can be assigned any desired color and pattern as usual. Three CALL LINK routines are available: MAUSO halts the main program until the sprite cursor is positioned as desired and the Mouse Key is pressed; MAUS1 is an interrupt routine which allows the Extended BASIC program to continue running while keeping track of the position of the mouse; and MCLR cancels the MAUS1 interrupt routine. MAUSE0 is analogous to an INPUT statement in BASIC; all processing stops until an entry is made. The interrupt routine, on the other hand, "automatically" keeps track of the mouse as the program continues execution. Interrupt routines, executed many times each second, tend to slow down operation of an Extended BASIC program so the MCLR routine should be executed whenever mouse input is not to be obtained. (An in-depth explanation of this principle can be found in J. Peter Hoddie's article "Attach a Sprite to a Joystick" in MICROpendium's Oct. '86 issue.)

CALL LOAD or CALL PEEK statements are used to read or assign mouse parameters, allowing a high

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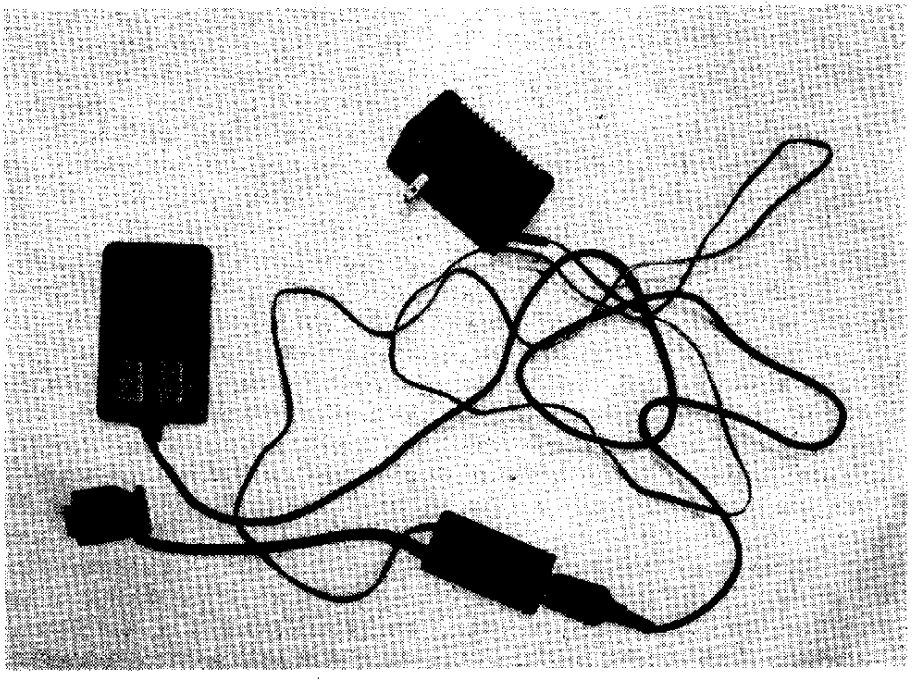

Newsbytes

CorComp to release new word processor

CorComp's new word processing program, Writer-Ease, is scheduled for a mid-February release, according to Jackirae Sagouspe, president of CorComp.

The program features a 30,000-word dictionary and spell checker. A single word or an entire document may be checked against the dictionary without the user leaving the edit mode, she says.

The program also enables the user to see a list of possible words which his misspelled word might be intended to be.

List price for the two-disk package is $49.95, Sagouspe says.

Mike Norton of CorComp says that minimum requirements to use the program are a single-sided, single-density disk drive with a TI or CorComp disk controller.

He notes that with the Writer-Ease program, files can be printed from the edit mode rather than requiring entry into a formatter mode. The program also features help menus, he notes.

For further information, contact CorComp, 2211 Winston Rd., Unit G, Anaheim, CA 92806 or (714) 956-4450.

CGSD Disk #4 out

Texaments announces that Character Sets and Graphics Design User Disk #4 is now available for owners of the CSGD software series, which includes CSGD III.

According to Steve Lamberti of Texaments, the two-disk package contains 16 new fonts, 11 of which include lower case, and 61 small graphics. Among the font types are Artdeco, Cameo, Starlet and Squish. He says the small graphics include 51 different monograms for creating letterheads and stationery.

CSGD User Disk #4 is available for $10.95 plus $2 postage and handling from Texaments.

Lamberti notes that many fonts and graphics in the CSGD series and Texaments' Artist Companion series are compatable with Peter Hoddie's Font Writer program, marketed by Asgard.

Lamberti says Texaments plans to release a Font Writer Sampler package, which will include a mixture of fonsts and graphics presently available and a handful of demonstration items, for Font Writer owners.

He notes, however that compatibility of Texaments products with Font Writer is not guaranteed.

For further information, contact Texaments, 53 Center St., Patchogue, NY 11772 or (516) 475-3480.

FLUG changes time for Dallas meetings

The Forest Lane Users Group announces a change in its meeting time to 2 p.m. the first Saturday of each month.

The group meets at the SC Cafeteria at the Main Texas Instruments Headquarters on Central Expressway and LBJ Freeway in Dallas, Texas. The cafeteria is in the same building as the TI Employment Center, club president Richard Fleetwood says.

Fleetwood says the club is open to all users of the TI99/4A, CC40 or any of the TI family of home computers. He says he and several other members are TI employees and many of them have some of the "classic hardware that TI was going to release but never did. He says three members have working versions of "the infamous 99/8 computer as well as a couple of 99/2 machines."

He says the users group is interested in sharing hardware projects with other users groups.

Fleetwood says that the club wishes to exchange newsletters with other users groups. He asks that newsletters or requests for information be sent to Forest Lane TI Users Group, P.O. Box 743005, Dallas, TX 75240. He notes that the P.O. box is an address change and asks that groups which have been exchanging check to be sure that they are sending to the correct address. He says the club offers memberships to users who may not be able to make club meetings.

The group also operates a 24-hour TIBBS at 300/1200 baud. F.L.U.G. TIBBS offers Xmodem and TEII downloads as well as "dozens of different text files," Fleetwood says.

He says that as sysop, he has "highly modified" the TIBBS program and that the board offers many features not found on on other TI BBS programs. He says two new menus are being added, bringing the total number of menus to five. He says the File Transfer section has been highly modified to include seven catalogs, private uploads and online upload disk cataloging, and offers more than 140 ("soon to be many more") downloads.

Phone number for the F.L.U.G. TIBBS is (214) 321-4238, accessable through PC Pursuit's 214 area code node. Fleetwood says new users of the TIBBS will be verified within 24 hours and will be given access to most of the board's features.

Clinic BBS observes first anniversary

The Clinic BBS of Joliet, Illinois celebrated its first anniversary Jan. 1 and has logged more than 10,000 calls, according to Robert Neal, co-sysop.

The board is sponsored in part by the TI Users Group of Will County. The phone number is (815) 741-2135. Sysop is Doug Redmond.

Neal wrote the BBS using the assembly routines of Monty Schmidt's Techie BBS. He says he added "many improvements and features."

The board runs at 300/1200 baud and is online 24 hours a day. Features include Xmodem file transfers, six message bases including a global read, E-Mail, seven online adventure games and several ASCII files.

Newsbytes is a column of general information for TI99/4A users. It includes product announcements and other items of interest. The publisher does not necessarily endorse products listed in this column. Vendors and others are encouraged to submit items for consideration.

MECHATRONIC MOUSE—

(Continued from Page 39)

degree of control in Extended BASIC programs. A continuous set of nine bytes contain the data, allowing several parameters to be read or written with a single PEEK or LOAD. The parameters include the vertical and horizontal position of the sprite cursor, status of the mouse key, vertical and horizontal location of the "home" position and specification of the upper, lower, left and right boundaries. The sprite boundaries establish a "window" within which the sprite can be moved.

Evaluation with TI-Artist

Perhaps the most obvious use of the mouse would be with a program like TI-Artist. One of the many ways in which this program is unique is that it allows the user to specify a "DSR" (Device Service Routine) for new input devices. So I sent the mouse to Chris Faherty, author of TI-Artist, and he quickly modified the assembly program provided into a DSR. The only thing lost was the "rubber-band" effect.

In the process, Chris provided some feedback about the performance of TI-MOUSE relative to others he had worked with (the MAC mouse, Tandy, etc.). He said that the TI-MOUSE was much faster and much more responsive than others he had tried. He was also very happy with how easily the TI-MOUSE moved. He said some others were like sandpaper by comparison. Chris also told me that similar devices for other computers sold for 20 percent to 30 percent more than TI-MOUSE. TI-Artist users can obtain a copy of the DSR from T.A.P.E. or Inscebot.

Bill Sager, president of New Horizons Computer Club and TI-Artist user, offered to evaluate the mouse with TI-Artist. Bill said his kids (ages 6, 8 and 10) loved it and took to it right away. It greatly simplified use of TI-Artist for them.

He said that using the mouse speeded up TI-Artist somewhat and made it much easier to draw curved lines, ovals, ellipses, etc. Drawing a straight line freehand was rather difficult, but the LINES, K-LINES and H/V LINES of TI-Artist could easily be used. In general, he said, he had much better control of the cursor.

Although it is possible to move the mouse too fast when drawing, causing it to skip pixels, Bill said that, as with many new tools, this just took a little practice to develop the right technique. The most prominent drawback was loss of the rubber-band effect, but Bill was able to compensate the more he used the mouse. Also, because of the much greater responsiveness of the mouse, working in ZOOM mode was more difficult, but not impossible.

Over all, Bill felt that the mouse is a great addition to use of TI-Artist in that it eliminates the stiff action of the joystick and provides a more delicate touch when using the program.

The Mechatronic TI-MOUSE is a well-engineered product that is easy to use. I would highly recommend it to anyone in the market for a mouse.

User Notes

GK and TIW

Terry Atkinson, writing in the Toronto Users Group newsletter, Newsletter 9T9, offers advice for those who want TI-Writer and other programs, such as Extended BASIC and Editor/Assembler, to reside in the GRAM Kracker. He writes:

It didn't take me long to figure out that when you go from the title screen to the first menu that you have all of those foreign language options from the TI-Writer cartridge, followed by E/A and XBASIC.

The seven TI-Writer selections, plus E/A-XBASIC filled the whole screen. This made it nearly impossible to add any other modules or BASIC programs to the GK memory.

(To change this) I found that all I needed was to load TI-Writer into the GRAM space then use the search function of the GK editor to find the PROCESADOR. When you've found it, you must then move back five bytes. This can be done by placing the cursor on the "P" in PROCESADOR and pressing FCTN S five times. Take note of the number in the upper left corner of the screen. This is the byte that you will be changing.

Press FCTN + to switch to hex. Then place the cursor on the byte to be changed and enter 60CB.

That's all there is to it. The only other thing you need to do is to save the cartridge to disk. After that you can use the GK Utility disk to move TI-Writer to GRAM 1 or 2.

Atkinson cautions that this modification may not work with all versions of TI-Writer.

Pager utility saves/recalls screens

Michael St. Vincent, of the Los Angeles 99ers User Group, has created a utility that allows users to store and recall up two screens. The subroutine is written in assembly language. We're including the assembly source code and a version of the program in Extended BASIC CALL LOADs for those without an editor/assembler.

First, though, let St. Vincent describe his program.

(In 9900 machine language) "the screen, usually a set of rows and columns to a BASIC programmer becomes only a set of memory locations. In this form, moving a copy of the screen becomes as simple as assigning the assembly equivalent of a few variables and a GOSUB. The possible applications of these subprograms are

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limited only by the programmer's imagination."

In the assembly version, the programs are loaded into memory by using CALL INIT :: CALL LOAD("DSK1.PAGER/OBJ"). In the XBASIC version, load and run the PAGER program prior to using it. In both cases, the routines are loaded into memory and become "invisible" until CALLed. The program names are PGSAV1, PGSAV2, PGSHO1 and PGSHO2. The SAV programs save everything on the screen at the instant they are called to pages 1 and 2. The SHO programs recall the screens. All four are CALLed in this manner: CALL LINK("pgname"). Use of OLD, SAVE MERGE or NEW commands do not affect these programs. According to St. Vincent, "one could list a program, save a screen of the list, load a new program and still be able to lok at the listing of the old program. The only restrictions are that these programs store only characters. Colors and sprites are not kept."

"The program in assembly uses a simple system of setting up a block of CPU RAM to store pages. Once a screen is to be stored, the registers 0, 1 and 2 are loaded with the address of the screen map in VDP RAM (000), the address of the CPU RAM block, and the number of bytes to transfer (768 for the full screen). A BLWP command (branch and link with workspace pointer) links to another utility routines which does the actual transfer. After the transfer is completed, the program uses the pseudo-opcode RT to reset the workspace pointer to the BASIC interpreter area from where it branched. At that point, the BASIC program continues to execute."

To enter the assembly program, use the Editor/Assembler editor and type in the source listing below. Use the FCTN 7 tab key to line everything up. After entering, save the source code (press FCTN 9 and then select SAVE). Use the filename PAGER/SOU. Then load the assembler. Enter DSKn.PAGER/SOU when prompted for the source filename, and enter DSKn.PAGER/OBJ when prompted for the object filename. The options are RSL if give a printer device name or RS if don't. The assembler will then go into action and should print 0000 ERRORS at the end.

Screen Page Utility

```
* THE SCREEN PAGE UTILITY
* SOURCE CODE WRITTEN BY MICHAEL ST. VINCENT
* USED TO STORE UP TO 2 SCREEN-FULLS FOR LATER
* USE
       DEF  PGSAV1,PGSAV2,PGSHO1,PGSHO2 * NAME
*                                         ROUTINES
VMBW   EQU  >2024          * VDP WRITE ROUTINE
VMBR   EQU  >202C          * VDP READ ROUTINE
SCRMAP EQU  >0000          * START OF SCREEN MAP
*                            ADDRESS
SCRCNT EQU  768            * NUMBER OF CHARACTERS
*                            IN MAP
PAGE1  BSS  768            * STORAGE BUFFER 1
PAGE2  BSS  768            * STORAGE BUFFER 2
PGSAV1 LI   R1,PAGE1       * ACTIVATE BUFFER 1
       JMP  GOSAVE         * GOTO THE SAVE ROUTINE
PGSAV2 LI   R1,PAGE2       * ACTIVATE BUFFER 2
GOSAVE LI   R0,SCRMAP      * STARTING POINT TO
*                            READ FROM MAP
       LI   R2,SCRCNT      * NUMBER OF BYTES TO
*                            MOVE
       BLWP @VMBR          * "GOSUB" TO READ
       RT                  * RETURN TO BASIC
PGSHO1 LI   R1,PAGE1       * ACTIVATE BUFFER 1
       JMP  GOSHOW         * GOTO THE RESTORE
*                            ROUTINE
PGSHO2 LI   R1,PAGE2       * ACTIVATE BUFFER 2
GOSHOW LI   R0,SCRMAP      * STARTING POINT TO
*                            REPLACE MAP
       LI   R2,SCRCNT      * NUMBER OF BYTES TO
*                            MOVE
       BLWP @VMBW          * "GOSUB" TO WRITE BACK
*                            TO MAP
       RT                  * RETURN TO BASIC
       END
```

XB Screen Utility

```
0 !*      "
1 CALL INIT
2 CALL LOAD(16352,80,71,83,7
2,79,50,43,18)
3 CALL LOAD(16360,80,71,83,7
2,79,49,43,12)
4 CALL LOAD(16368,80,71,83,6
5,86,50,42,250)
5 CALL LOAD(16376,80,71,83,6
5,86,49,42,244)
6 CALL LOAD(8194,43,36,63,22
4)
7 CALL LOAD(9460,128,128,176
,210,197,211,211,128,165,174
,180,165,178,128,215,200,197
,206,128,198,201,206)
8 CALL LOAD(9482,201,211,200
,197,196,128,128,128,128,128
,128,128,227,227,227,227,227
,227,227,227,227,227)
9 CALL LOAD(9504,227,227,227
,227,227,227,227,227,227,227
,227,227,227,227,227,227,227
```

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```
,227,128,128,128,128)
10 CALL LOAD(9526,198,207,21
0,128,195,200,197,195,203,20
1,206,199,128,208,213,210,20
8,207,211,197,211,128)
11 CALL LOAD(9548,128,128,12
8,128,128,128,128,128,128,12
8,227,227,227,227,227,227,22
7,227,227,227,227,227)
12 CALL LOAD(9570,227,227,22
7,227,227,227,227,227,227,22
7,227,227,227,227,227,227,12
8,128,128,128,128,145)
13 CALL LOAD(9592,128,176,16
7,179,161,182,145,128,146,12
8,176,167,179,161,182,146,12
8,147,128,176,167,179)
14 CALL LOAD(9614,168,175,14
5,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
15 CALL LOAD(9636,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,148,128,176)
16 CALL LOAD(9658,167,179,16
8,175,146,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
17 CALL LOAD(9680,128,128,12
8,128,128,128,227,227,227,22
7,227,227,227,227,227,227,22
7,227,227,227,227,227)
18 CALL LOAD(9702,227,227,22
7,227,227,227,227,227,227,22
7,227,227,128,128,128,128,12
8,128,128,128,128,128)
19 CALL LOAD(9724,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
20 CALL LOAD(9746,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
21 CALL LOAD(9768,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
22 CALL LOAD(9790,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
23 CALL LOAD(9812,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
24 CALL LOAD(9834,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
25 CALL LOAD(9856,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
26 CALL LOAD(9878,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
27 CALL LOAD(9900,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
28 CALL LOAD(9922,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
29 CALL LOAD(9944,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
30 CALL LOAD(9966,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
31 CALL LOAD(9988,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128,128,12
8,128,128,128,128,128)
32 CALL LOAD(10010,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
33 CALL LOAD(10032,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
34 CALL LOAD(10054,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,2
27,227,227,227,227,227)
35 CALL LOAD(10076,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227)
36 CALL LOAD(10098,128,128,1
28,128,164,165,166,128,174,2
07,142,128,159,128,136,145,1
28,141,128,148,128,137)
37 CALL LOAD(10120,128,128,1
45,128,128,128,128,128,128,1
28,128,128,128,128,227,227,2
27,227,227,227,227,227)
38 CALL LOAD(10142,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,128,128)
39 CALL LOAD(10164,128,128,1
76,210,197,211,211,128,165,1
74,180,165,178,128,215,200,1
97,206,128,198,201,206)
40 CALL LOAD(10186,201,211,2
00,197,196,128,128,128,128,1
28,128,128,227,227,227,227,2
27,227,227,227,227,227)
41 CALL LOAD(10208,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227,227,2
27,227,128,128,128,128)
42 CALL LOAD(10230,176,210,1
97,211,211,128,165,174,180,1
65,178,128,215,200,197,206,1
28,198,201,206,201,211)
43 CALL LOAD(10252,200,197,1
96,128,128,128,128,128,128,1
28,227,227,227,227,227,227,2
27,227,227,227,227,227)
44 CALL LOAD(10274,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227,227,1
28,128,128,128,198,207)
45 CALL LOAD(10296,210,128,1
95,200,197,195,203,201,206,1
99,128,208,213,210,208,207,2
11,197,211,128,128,128)
46 CALL LOAD(10318,128,128,1
28,128,128,128,128,128,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227)
47 CALL LOAD(10340,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,128,128,1
28,128,128,145,128,176)
48 CALL LOAD(10362,167,179,1
61,182,145,128,146,128,176,1
67,179,161,182,146,128,147,1
28,176,167,179,168,175)
49 CALL LOAD(10384,145,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
50 CALL LOAD(10406,128,128,1
28,128,128,128,128,128,128,1
```

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```
28,128,128,128,128,128,128,1
28,148,128,176,167,179)
51 CALL LOAD(10428,168,175,1
46,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
52 CALL LOAD(10450,128,128,1
28,128,227,227,227,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227)
53 CALL LOAD(10472,227,227,2
27,227,227,227,227,227,227,2
27,128,128,128,128,128,128,1
28,128,128,128,128,128)
54 CALL LOAD(10494,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
55 CALL LOAD(10516,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
56 CALL LOAD(10538,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
57 CALL LOAD(10560,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
58 CALL LOAD(10582,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
59 CALL LOAD(10604,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
60 CALL LOAD(10626,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
61 CALL LOAD(10648,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
62 CALL LOAD(10670,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
63 CALL LOAD(10692,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
64 CALL LOAD(10714,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
65 CALL LOAD(10736,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
66 CALL LOAD(10758,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
67 CALL LOAD(10780,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
68 CALL LOAD(10802,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,128)
69 CALL LOAD(10824,128,128,1
28,128,128,128,128,128,128,1
28,128,128,128,128,227,227,2
27,227,227,227,227,227)
70 CALL LOAD(10846,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,128,128)
71 CALL LOAD(10868,128,128,1
64,165,166,128,174,207,142,1
28,159,128,136,145,128,141,1
28,148,128,137,128,128)
72 CALL LOAD(10890,146,128,1
28,128,128,128,128,128,128,1
28,128,128,227,227,227,227,2
27,227,227,227,227,227)
73 CALL LOAD(10912,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227,227,2
27,227,128,128,128,128)
74 CALL LOAD(10934,176,210,1
97,211,211,128,165,174,180,1
65,178,128,215,200,197,206,1
28,198,201,206,201,211)
75 CALL LOAD(10956,200,197,1
96,128,128,128,128,128,128,1
28,227,227,227,227,227,227,2
27,227,227,227,227,227)
76 CALL LOAD(10978,227,227,2
27,227,227,227,227,227,227,2
27,227,227,227,227,227,227,1
28,128,2,1,36,244)
77 CALL LOAD(11000,16,2,2,1,
39,244,2,0,0,0,2,2,3,0,4,32,
32,44,4,91,2,1)
78 CALL LOAD(11022,36,244,16
,2,2,1,39,244,2,0,0,0,2,2,3,
0,4,32,32,36,4,91)
79 CALL LOAD(11044,0,0)
80 CALL LINK("PGSH02")
81 CALL LINK("PGSH01")
82 CALL LINK("PGSAV2")
83 CALL LINK("PGSAV1")
```

Rock Hopper modifications

W.A. Ragsdale, of El Toro, California, provides some suggestions to improve the Rock Hopper game published in the January 1987 MICROpendium.

I think this is a great game (but) a couple of things bothered me in playing the game, and I have enclosed a program modification. First, it clears up the garbage screens that occurred between games. In addition, it has an additive section which increases the count of men by one upon reaching levels 5, 10, 15, etc.

Here are the modifications:

```
80 CALL CLEAR :: CALL DELSPR
ITE(ALL):: CALL CHARSET
90 LEV=1 :: PO=0 :: HO=8 ::
SR=177 :: MEN=5 :: R1=8 :: R
2=9 :: R3=7
105 IF LEV/5=INT(LEV/5)THEN
MEN=MEN+1
130 CALL DELSPRITE(ALL):: CA
LL HCHAR(22,1,33,5)
1860 CALL CLEAR :: CALL DELS
PRITE(ALL):: CALL CHARSET ::
CALL SOUND(100,500,1,800,1,7
00,1):: CALL SOUND(100,600,1
,600,1,800,1)
```

This modification may be typed in and saved in MERGE format, then MERGEd into the original Rock Hopper program.

Routine deletes columns from TIW

Jim Peterson, of Tigercub Software, responds to a reader's request:

Re the request of the December

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issue, if all that the reader wants to do is to delete a column in a TI-Writer file, that can be easily done with this simple subprogram:

```
30000 SUB DELETE(M$(),J,T,N)
30001 M$(J)=SEG$(M$(J),1,T-1
)&RPT$(" ",N)&SEG$(M$(J),T+N
,255):: SUBEND
```

M$() is the array, J is the subscript number, T is the tab position to delete from and N is the number of characters to delete.

This can be used on an array already in memory by, for example:

```
100 FOR J=1 TO 100 :: CALL DELE
TE(M$(),J,25,5) :: NEXT J
```

The following routine will demonstrate it.

```
100 A$="ABCDEFGHIJKLMNOPQRST
UVWXYZ"
110 M$(1)=A$ :: INPUT "TAB?
":T :: INPUT "HOW MANY SPACE
S? ":N :: CALL DELETE(M$(),1
,T,N):: PRINT :M$(1):: M$(1)
=A$ :: GOTO 110
30525 SUB DELETE(M$(),J,T,N)
30526 M$(J)=SEG$(M$(J),1,T-1
)&RPT$(" ",N)&SEG$(M$(J),T+N
,255):: SUBEND
```

Multiplan suggestions

Gerard Volbrecht, of Ahun, France, responding to a Feedback item in the November 1986 edition, offers some suggestions for Microsoft Multiplan users. He writes:

Dennis Wood asks how to allow data files to be loaded from a second disk, and how to eliminate need to name Multiplan disk "TIMP".

On the first point: see the Multiplan manual, page 154, example for Transfer Options. It is possible to permanently change the default for DSK1 by changing DSK1 to DSK2 (or other drive designation, such as WDS1 for a hard disk) in the second sector of the file called MPINTR.

On the second point, the Overlay and MPHLP files may be written to any disk if you modify their filenames, stored in the second sector of the MPINTR file. You must use a sector editor to modify the MPINTR file.

Overlay: the file name is DSK.TIMP.OVERLAY. The length of this filename 10 characters. This value is stored in the byte just before the last letter of the filename. You may change the original filename to DSKn.OVERLAY, for instance, and correct the filename length byte (change 10 to 0C).

MPHLP: the filename is DSK.TIMP.MPHLP. You may change it to DSKn.MPHLP, and correct the length of filename byte (change 0E to 0A).

Of course, when using Multiplan you must put a disk with the Overlay and MPHLP files into drive "n". Also, do not protect these files.

The filenames used by Multiplan to access the four other files — MPBASE, MPCHAR, MPDATA and MPINTR — are stored in GROM 3 of the Multiplan cartridge. You need a hardware with GRAM to change these filenames: MAXIMEM, GRAM Kracker, or the GRAM Karte from Mechatronic.

The filenames are: DSK.TIMP.MPCHAR, DSK.TIMP.MPDATA, DSK.TIMP.MPINTR and DSK.TIMP.MPBASE. Change them to: DSKn.MPCHARXXXX, DSKn.MPDATAXXXX, DSKn.MPINTRXXXX and DSKn.MPBASEXXXX. There is no length byte to correct.

When using Multiplan you must place a disk with the renamed files — MPCHARXXXX, MPDATAXXXX, MPINTRXXXX and MPBASEXXXX — into drive "n".

I own a MAXIMEM and two Horizon RAMdisks. One RAMdisk is at CRU address 1000, the other at CRU 1400. I have been able to use Multiplan with the files MPBASEXXXX, MPCHARXXXX, MPDATAXXXX and MPINTRXXXX, Overlay and MPHLP into the RAMdisk at CRU 1000. But when I tried to store the files in the RAMdisk at CRU 1400, I found that Multiplan failed to access Overlay and MPHLP. So, I stored Overlay and MPHLP in the RAMdisk at CRU 1000 and the other four files in the RAMdisk at CRU 1400.

Program displays any file type

TEXTPRO is a program that will read and display virtually any file type. It was published in the Pittsburgh User Group newsletter, the Peripheral.

The program requires Extended BASIC. The program provides a menu of file types to choose from. If you wish to display a file type that is not among the seven listed, you may modify lines 450 and 460 and then access this file using the "User-Defined" menu option. The program will display text files, files created by other programs, Multiplan files, etc. However, it cannot access programs. Output may be directed to a printer, as well as the screen.

One use we've found for it is to dump program listings to a printer. Our procedure on any program that appears in MICROpendium is to first run it, then save it via the LIST command as a D/V 80 file. Then we run it through a modified version of Jim Peterson's program that formats LISTed programs into a 28-column format. (We modified it so that we can output programs of varying column widths.) Normally, we would then load the formatted listing into TI-Writer, and from there dump it to a printer. With TEXTPRO, we can output the formatted listing directly to the printer without loading TI-Writer.

```
100 CALL CLEAR :: CALL SCREE
N(16) :: DISPLAY AT(2,11) :
"TEXTPRO": " "&RPT$("=",24)
110 DISPLAY AT(6,1)BEEP : "S
eelect File Parameters": : "
1) DIS/VAR 80": "2) DIS/FIX
80": "3) DIS/VAR 254": "4) D
IS/FIX 254": "5) DIS/VAR 163
"

120 DISPLAY AT(13,1) : "6) I
```

(See Page 46)

User Notes

(Continued from Page 45)

```
NT/VAR 254": "7) INT/FIX 254
": "8) User Defined": "9) Ot
her": : "Choice? 1"
130 ACCEPT AT(18,9)SIZE(-1)V
ALIDATE ("123456789") : T
140 IF T<9 THEN 180 ELSE DIS
PLAY AT(6,1)ERASE ALL BEEP :
 "YOU MUST MODIFY LINES 450
AND 460 BEFORE PROCEEDING.":
 : "MODIFY THE FILE PARAMETE
RS"
150 DISPLAY AT(10,1) : "ON L
INE 450.": : "IF THE FILE IS
 A DISPLAY TYPE, LINE 460 SH
OULD READ:  F=1": : "IF THE
FILE IS AN INTERNAL"
160 DISPLAY AT(17,1) : "TYPE
, LINE 460 SHOULD READ: F=2"

170 DISPLAY AT(20,1) : "THEN
 RE-RUN THE PROGRAM AND SELE
CT THE 'USER-DEFINED' FILE T
YPE." :: END
180 CALL HCHAR(6,1,32,416) :
: DISPLAY AT(6,1)BEEP : "Dev
ice.Filename": ")" :: ACCEPT
 AT(7,2) : FILE$
190 ON T GOSUB 380,390,400,4
10,420,430,440,450
200 DISPLAY AT(9,1)BEEP : "P
rintout of File? (Y/N)": ")N
" :: ACCEPT AT(10,2)SIZE(-1)
 : P$
210 IF P$="N" THEN 300
220 DISPLAY AT(12,1)BEEP : "
Printer Devicename": ")RS232
/2.BA=9600" :: ACCEPT AT(13,
2)SIZE(-27) : P$
230 OPEN #2: P$,OUTPUT , DIS
PLAY
240 IF EOF(1) THEN 360
250 ON F GOTO 260,270
260 LINPUT #1: A$ :: GOTO 28
0
270 INPUT #1: A$
280 CALL KEY(0,K,S) :: IF S(
)0 THEN 280 ELSE PRINT A$ ::
 PRINT #2: A$
290 GOTO 240
300 IF EOF(1) THEN 370
310 ON F GOTO 320,330
320 LINPUT #1: A$ :: GOTO 34
0
330 INPUT #1: A$
340 CALL KEY(0,K,S) :: IF S(
)0 THEN 340 ELSE PRINT A$
350 GOTO 300
360 CLOSE #2
370 CLOSE #1 :: END
380 F=1 :: OPEN #1: FILE$, I
NPUT , DISPLAY ,VARIABLE 80
:: RETURN
390 F=1 :: OPEN #1: FILE$, I
NPUT , DISPLAY ,FIXED 80 ::
RETURN
400 F=1 :: OPEN #1: FILE$, I
NPUT , DISPLAY ,VARIABLE 254
 :: RETURN
410 F=1 :: OPEN #1: FILE$, I
NPUT , DISPLAY ,FIXED 254 ::
 RETURN
420 F=1 :: OPEN #1: FILE$, I
NPUT , DISPLAY ,VARIABLE 163
 :: RETURN
430 F=1 :: OPEN #1: FILE$, I
NPUT ,INTERNAL ,VARIABLE 254
 :: RETURN
440 F=1 :: OPEN #1: FILE$, I
NPUT ,INTERNAL ,FIXED 254 ::
 RETURN
450 OPEN #1: FILE$, INPUT ,I
NTERNAL ,FIXED 80
460 F=2
470 RETURN
```

User Notes is a column of tips and ideas designed to help readers put their home computers to better use. The information provided here comes from many sources, including TI home computer user group newsletters. MICROpendium will pay $10 for any item sent in by readers that appears in this column. Mail tips to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

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