

Vol. 10 No. 2  
February 1987

## THE MSP 99 NEWSLETTER

### HORIZON RAMDISK REVIEW

by Steve Schmitt

I have had a Horizon Ramdisk on my system for about two months and would like to share some of my experiences with it. The Ramdisk is a card which goes into the PE box and acts just like a diskette drive. The card has 192K bytes of static memory and on card battery to back-up the memory when power is off. With 192K of memory, the card simulates a 720 sector disk.

What does the Ramdisk do? Mostly it is a very fast disk drive which can load or store a program in one to two seconds. Of course after the program is loaded the system has to relocate the program from VDP RAM to high RAM and prescan it so the whole operation is much longer than a few seconds.

The Ramdisk also has its DSR code in RAM so it can be changed and reloaded at will. It is possible to write your own code to run at power-on time, interrupt service time or add TI Basic calls. There is enough space left over to do many of these things without changing the Ramdisk code.

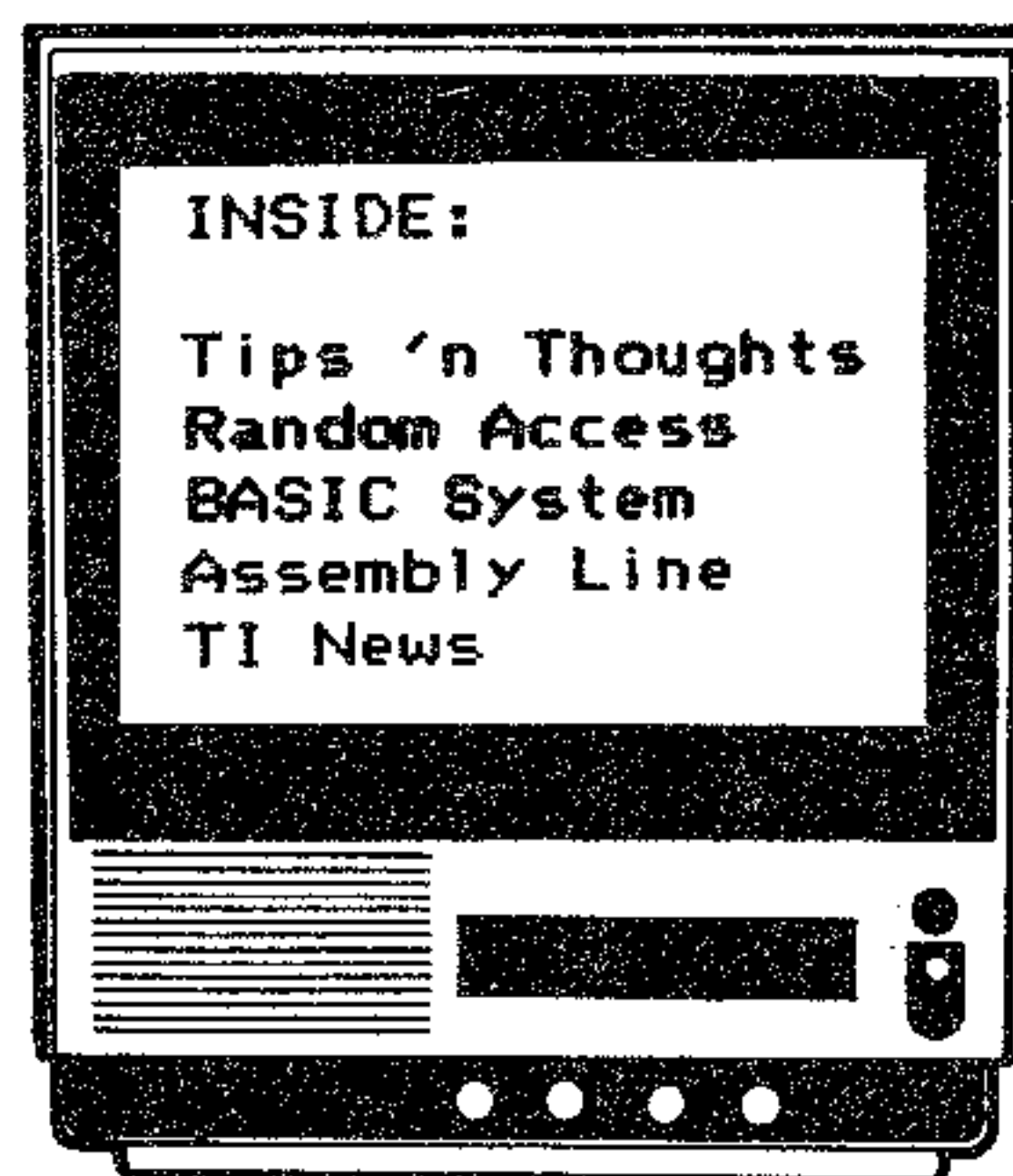
TI Basic will scan the PE cards for Call routines so it is reasonably easy to add commands to Basic. Extended Basic scans the PE cards for Call subroutines in the command mode only but not in the program mode. This means that new Call commands can be added and used in Basic programs and Extended Basic command mode but not in Extended basic programs. However Horizon has supplied a command 'Delete "XBCALL" ' which moves all the subprograms to low memory so that they can be accessed with Call Link commands. Horizon supplies all the source code for the Ramdisk and also for several of the utility programs. All of the code is open for the user to look at, modify and use with your own home-brew logic.

(Continued on Page 15)

### RAFFLE UPDATE

Last month at the January meeting we raffled off another of those 19" color TV sets to another lucky raffle winner. That's right! One of the members attending the meeting went home with a TV tucked under his arm. (Figuratively speaking.) Won't his wife be surprised when Herman Saul's walks in with it.

A second raffle drawing was also held for a stack of Computer Shopper back issues donated by our group president, Dick Lauhead. These went to Bob Bowman who had a much easier time carrying them home than Dr. Saul did even if he can't watch re-runs of Happy Days with them. However we expect to have many more happy days at the upcoming meetings with lots of new and interesting items for our raffle winners. Don't miss a single one, or you'll be the loser.



The MSP 99 USERS GROUP meets each month for discussions and presentations that enable its members to be better informed about their computers. Users group members share and exchange information. Some members have a broad range of computer expertise, others are just beginning. We are not affiliated with or sponsored by any other group or company. Membership dues are \$18 a year for a family or individual, and \$50 for a sponsor member. You're welcome to visit a meeting as a guest before you join. Call or write for more information.

USERS GROUP MEETINGS are held the third tuesday of each month at Dunwoody Industrial Institute, 818 Wayzata Blvd., Minneapolis, MN 55403. Meetings start at 7:00 PM.

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The MSP 99 NEWSLETTER is published eleven times per year on a monthly basis, except during July, by the MSP 99 Users Group. Members are encouraged to contribute articles for publication. Opinions expressed are those of the writers and not necessarily those of the MSP 99 Users Group, its officers, editors, or members. Materials accepted by the editors for publication in the MSP 99 Newsletter, including software listings, are believed to be in the public domain. Newsletter articles may be reproduced by other users groups if appropriate credit is given to the author (if one is listed), and to the Minneapolis, St. Paul 99 Users Group.

NEWSLETTER EDITOR

Gary Gese 529-3989

Articles intended for the next newsletter should be submitted NO LATER than the users group meeting on the month prior to publication. Articles submitted after this deadline are likely to appear in the following month's newsletter.

COMMITTEE VOLUNTEERS are sought for all of our committees. (Education, Equipment, Program, Publicity, Software, Newsletter)  
If you would like to join one of these committees or have an idea for a monthly program, please contact one of the officers.

COMMERCIAL ADVERTISEMENT RATES:  
Business firms that wish to communicate with our members may do so by placing an advertisement in the newsletter. Rates are:  
Full page \$40; Half page \$30;  
Quarter page \$22.

Each ad must be camera ready in one of the sizes indicated and paid in advance. Inserts (printed by the advertiser on 8 1/2 X 11 or 8 X 10) may be inserted in the newsletter at \$20 per sheet. Contact the editor for more information.

CHANGE OF ADDRESS: Before you move, please mail a change of address to the Users Group. DO NOT rely on the standard Post Office change of address card since the P.O. will not forward this Newsletter.

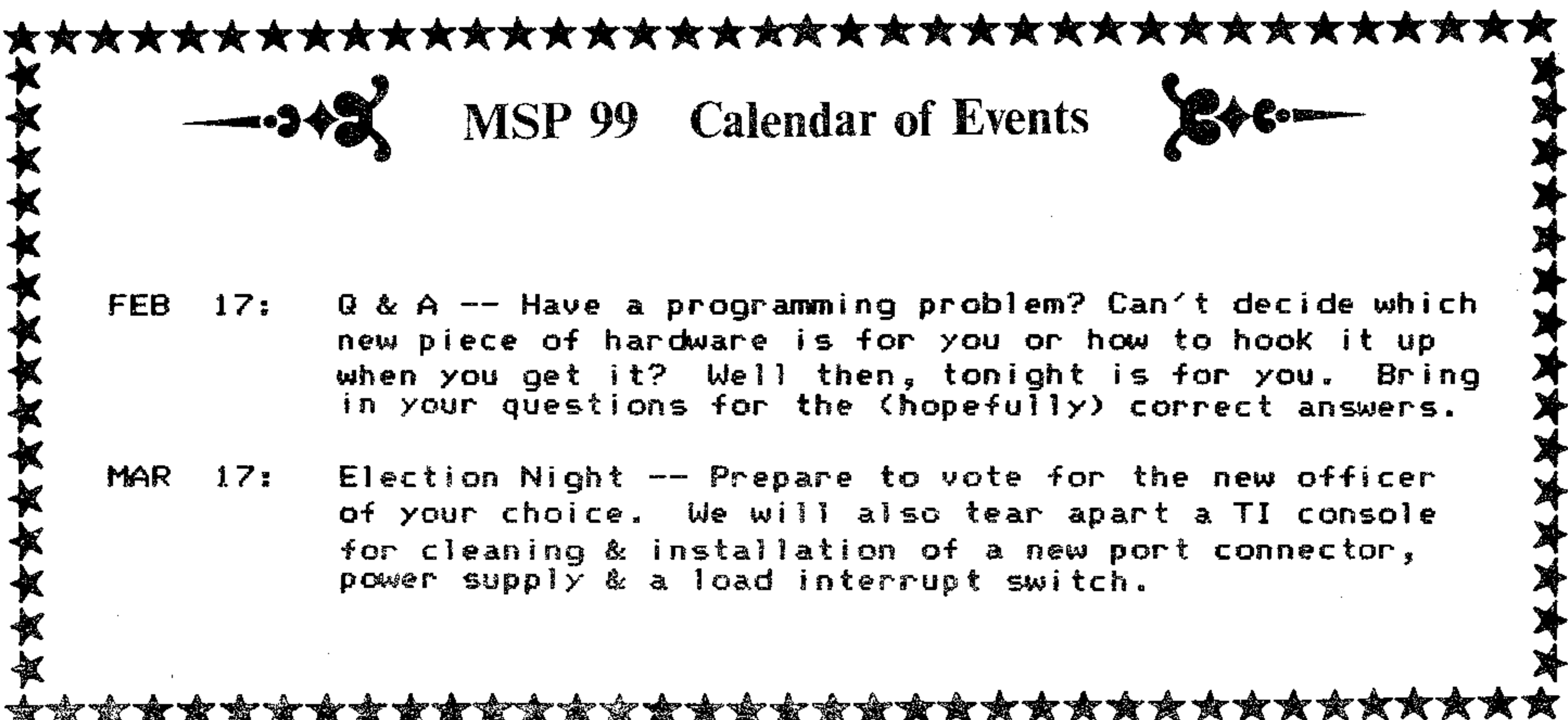
MATCH

```
100 RIGHT=0 :: WRONG=0 :: COUNT=0
110 CALL CLEAR
120 DISPLAY AT(9,5):"LETTER OR
NUMBER MATCH"
130 DISPLAY AT(11,5):"A PRESCHOOL
EDUCATION GAME"
140 PRINT :: DISPLAY AT(14,5)
BEEP:"WRITTEN BY: "
150 DISPLAY AT(18,5):"AL HATTEM"
160 RANDOMIZE
170 PRINT "ADULTS CAN ALSO USE
THIS AS A TOUCH TYPING KEY REVIEW
!": " ":
180 PRINT "PRESS ANY NUMBER FOR
NUMBER MATCH, PRESS ANY LETTER FOR
LETTER MATCH"
190 CALL KEY(0,J,S)
200 IF S=0 THEN 190
210 IF J<=64 THEN GOSUB 470
220 IF J>64 THEN GOSUB 490
230 CALL CLEAR
240 CALL MAGNIFY(2)
250 RV=INT(RND)+1 :: CV=INT(RND)+1
:: SC=INT(RND)+3 :: CO=INT(RND)+1
260 CO1=INT(RND)+1
270 CO2=INT(RND)+1
280 CO3=INT(RND)+1
290 CALL SCREEN(SC)
300 COUNT=COUNT+1 :: IF COUNT>=30
THEN 570
310 CALL SPRITE(#1,G,CO,110,125,
RV,CV)
320 CALL SPRITE(#2,G,CO3,110,125,
-(RV-20),-(CV-10))
330 CALL SPRITE(#3,G,CO1,110,125,
(RV-30),-(CV-25))
340 CALL SPRITE(#4,G,CO2,110,125,
-(RV-35),(CV-15))
350 CALL KEY(0,K,S)
360 IF S=0 THEN 350
370 IF K=G THEN CALL SOUND(400,
523,1,440,1)
380 GOSUB 510
390 IF K=G THEN 430
400 IF K<>G THEN CALL SOUND(400,
```

```
466,2,523,1,622,2,-4,0)
410 DISPLAY AT(12,13):"WRONG !"
420 GOSUB 530
430 CALL DELSPRITE(#1)
440 IF K<>G THEN 300
450 GOTO 210
460 STOP
470 G=INT(RND)+48
480 RETURN
490 G=INT(RND)+65
500 RETURN
510 RIGHT=RIGHT+1
520 RETURN
530 WRONG=WRONG+1
540 FOR DELAY=1 TO 200 :: NEXT
DELAY
550 CALL CLEAR
560 RETURN
570 CALL DELSPRITE(ALL)
580 PRINT "NUMBER OF RIGHT
GUESSES:";RIGHT:"NUMBER OF WRONG
GUESSES:";WRONG:"SCORE=";INT(RIGHT/
MORE"
590 CALL KEY(0,K,S)
600 IF S=0 THEN 590
610 IF K=89 THEN COUNT=0
620 IF K=89 THEN 210
630 END
```

STARFLEET

```
90 H$="0000000000000000FF020202021F0
0000000000000000000000847F3E64C0F0000
000"
95 CALL CHAR(96,H$)
100 CALL MAGNIFY(4):: INPUT "V,H
":V,H :: CALL SCREEN(2):: FOR X=1
TO 13 :: CALL
SPRITE(#X,96,X+2,102,24,V*.7,H/2,
#28-X,96,17-X,192,224,V/2,H*.7)::
NEXT X :: GO TO 100
110 REM THIS PUTS MULTIPLE SPRITES
OF THE STARSHIP ENTERPRISE ON THE
SCREEN-INPUT ROW AND COLUMN
VELOCITIES TO CHANGE WHILE PROGRAM
RUNS.
```



MSP 99
Calendar of Events

- FEB 17: Q & A -- Have a programming problem? Can't decide which new piece of hardware is for you or how to hook it up when you get it? Well then, tonight is for you. Bring in your questions for the (hopefully) correct answers.
  
- MAR 17: Election Night -- Prepare to vote for the new officer of your choice. We will also tear apart a TI console for cleaning & installation of a new port connector, power supply & a load interrupt switch.

**Subgroup Meetings**

- ASSEMBLY GROUP -- 1st Tuesday of month, 7:00 p.m.  
Bryant Community Center  
Bryant Ave and 31st St.
- BUSINESS and APPLICATION SIG  
Call Dick Clemetson (926-8083)
- EDUCATION -- At monthly meetings
- YOUTH GROUP - At monthly meetings

**Committee Chairs**

- EQUIPMENT -- George Madline  
(784-2395)
- NEWSLETTER -- Gary Gese  
(529-3989)
- PUBLICITY -- Dave Wunderlin  
(544-8266)
- SOFTWARE -- Steve Gonnella  
(533-8494)  
6281 Winnetka Ave  
Brooklyn Park, MN 55428
- YOUTH GROUP --  
Ed Johnson (690-3442)  
Gordy Myers (377-6713)

**UPCOMING EVENTS**

Included with this issue of the Newsletter you will find a sheet of raffle tickets and an election ballot.

The tickets are for resale to your family and friends. We will be awarding 2 hams to grace some lucky winners table this Easter. Please return the tickets, completely filled out, and all monies to the MSP Treasurer Mark Tellivic by the March meeting for the drawing. If more tickets are needed, feel free to photocopy the sheet of tickets you've recieved or you can download another sheet from the Techie BBS at 446-1419.

The election ballot should be filled out with your choice of officers and returned either in person or mailed to the MSP offices directly no later then March 17th for the election.

Also, don't miss the March 17th meeting where we'll be opening up and modifying a TI 99/4A computer.



## RANDOM ACCESS

By Dick Lauhead

There seems to be no end of new software for the TI99/4A. This month I want to review another relatively new product which I purchased a few months ago. The program is called Printer's Apprentice. (I'll call it PA from now on to save space.) It is available for \$22.50 from McCann Software, P.O. Box 34160, Omaha, NE 68134.

PA is a print shop type program which allows you to custom design pages to be printed on an Epson or Gemini printer. While it is not one of those fancy "what you see on the screen is what you get on the printed page" programs available for computers like the Mac, it is capable of producing the same results.

PA allows you to intermix TI-Artist pictures with TI-Writer text in any combination, anywhere on the page. You may have up to 100 different items on a page. Each item is a separate file created by the Picture Editor or Formatter (described later). All of the items may be placed on the page with a resolution of one dot position on your printer!

PA consists of 4 separate programs, written in FORTH, which are accessed through a menu. The first program is the Character Editor. This program allows you to design your own fonts, or modify the fonts supplied. (The version of PA I received contained 6 fonts.) You design characters on a large grid displayed on the screen. Since I have no desire to design my own fonts, I have not used this program enough to write intelligently about it.

The second program is the Picture Editor. While the Picture Editor gives you limited ability to draw your own pictures, its primary use is for editing TI-Artist \_P pictures. You can erase parts of the picture, or add parts to it. You can "clip" the picture to size. The picture can be flipped through both the vertical and horizontal axis. The Picture Editor is also used to save the picture in Extrn format required by the Scheduler.

The third program is the Formatter. The Formatter takes TI-Writer files and converts them to the desired font. It allows you to select the density of the print, whether you want an even right margin, the right and left margins, the inter-character spacing, the width of the space character, etc. The Formatter is also used to save the text in Extrn format required by the Scheduler. Both the Formatter and the Picture Editor allow you to actually print the text or picture before saving it. This lets you see what you have produced before you commit it to disk. The TI-Writer file used by the Formatter must have been saved using the PF option (NOT SF) in fixed format--e.g., F DKS1.TEXT.

The last program is the Scheduler. The Scheduler puts all the pieces together, and actually prints the page. It allows you to specify where each item will be placed on the page. The schedule can be saved to disk for future use.

Printer's Apprentice is a fantastic program, but is not easy to learn to use. The manual supplied has the details about all the programs, but it presents them in a confusing way. There are no examples provided except for a short script on each of the programs. There are placed at the back of the manual, but it is absolutely essential that you work through them early on. With a great deal of study and practice, you should be able to figure out how all the pieces fit together. Expect to spend 10-20 hours working with the program before you "see the light".

Although the program is written in FORTH, saving the formatted data to disk in Extrn format is excruciatingly slow, as is the actual printing. This is because there is a huge amount of data to transfer. The entire page is printed in bit graphics mode. I would not recommend you purchase this program if you have only one SS/SD disk drive. Accompanying this article is a reproduction of a page I produced for a demo at the Jan. meeting. The files to produce that page are about 450 sectors long, and the page took about 15 minutes to print. I should mention that it also took me an entire day to produce the page. A little more planning on my part probably would have cut that time in half.

Random Access.....cont. from Page 4  
 In summary, Printer's Apprentice is not an easy program to learn to use. However, it is one of those

rare programs that is worth whatever time it takes to learn. I love this program!

-RWL-

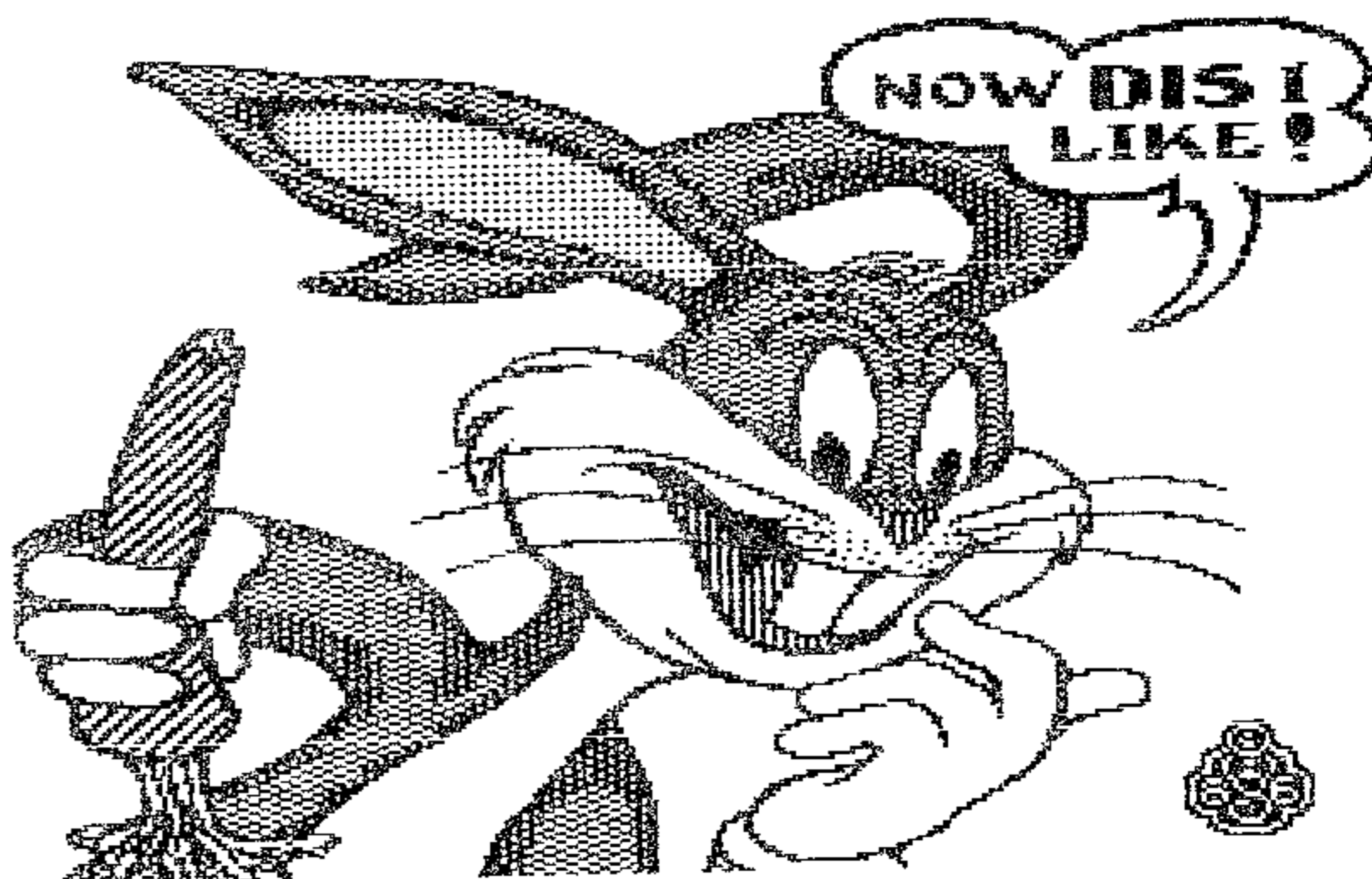


## MSP99 USERS GROUP



P. O. Box 12351, St. Paul, MN 55112

The Printer's Apprentice (PA) is an exciting new software package from McCann Software. PA is a print shop type program which allows you to custom design pages to be printed on your Epson or Gemini printer. TI-Artist P files, and TI-Writer text files may be intermixed in any position on the page. Text and pictures may be placed on the page with a resolution of one dot position on your printer! RLE pictures may be converted to TI-Artist format using MAX-RLE and then used by PA.



Printer's Apprentice is written in FORTH, and consists of 4 programs that are accessed through a menu. The first program is the Character Editor. This program allows you to design your own fonts, or modify the fonts provided. Six such fonts are provided with PA. A disk with additional fonts is also available. Fonts from other programs such as TI-Artists are not compatible with PA. You can, however, create text using TI-Artist, save it as a picture, and use the picture file with PA. That is how the heading on this page was created.

allows you to place text and pictures anywhere on the page. The Scheduler allows you to place up to 100 different items on a page. The Picture Editor and Formatter programs must be used to create files compatible with the Scheduler. Raw TI-Writer files, and TI-Artist pictures are NOT compatible with the Scheduler.

The second program is the Picture Editor. The Picture Editor gives you limited ability to draw pictures, but it is primarily meant to be used to edit TI-Artist pictures, or clip parts of those pictures to size.

The manual supplied with PA is probably the worst part of this package. While it contains all the details about the program, it does not contain many examples or descriptions of how to use the various programs. There are too many "trees" to see the "forest". With a great deal of study and practice, however, you CAN figure out how to use the program.

The third program is the Formatter. This program takes TI-Writer text and converts it to any of the available fonts. It also lets you select the density of the print, character spacing, micro-justification, etc.

Printer's Apprentice is available from McCann Software, P. O. Box 34160, Omaha, Nebraska 68134. The price for Printer's Apprentice is \$22.50, and TPA Fonts Disk One is \$11.50. As their ads say "A small price to pay". Updates are sent free to registered owners of Printer's Apprentice!

The last program is the Scheduler. The Scheduler puts all the pieces together and prints the page. It also

This page was produced in its entirety using Printer's Apprentice.

## Poor Richard's Peripheral Roundup

By Dick Dunbar

**HOW ABOUT 80 TRACKS:** It is now possible to obtain a set of EPROMs for your TI disk controller that will let you make full use of those 80 track floppy disk drives that seem to be everywhere these days. EPROM is an acronym standing for Electrically Programmable Read Only Memory, and these EPROMs contain the machine language instructions that make your disk controller do it's thing.

However, there is a possible fly in this nice ointment. There have been conflicting stories as to whether these EPROMs handle true double density (16 or 18 sectors per track) or not. These EPROMs are available from the same two outfits that seem to be dealing in all the innovative imports for the TI, T.A.P.E. Ltd and RYTE Data. The problem is that a couple of presumably knowledgeable sources previously had indicated that the TI controller could not be made to handle true double density.

The only writeup I have seen from T.A.P.E. Ltd. is an announcement of availability by Franz Wagenbach which was uploaded to one of the national timesharing services. This announcement makes references to double density, but the context in which it does so is ambiguous, so it would be wrong to jump to any conclusions based on it. The announcement makes tough reading, due to the language barrier, and what I think he means may not be what he thinks he says.

Ryte Data's newsletter, however, clearly indicates that true double density is supported, with a total of 1440 sectors PER SIDE of the diskette. I called Bruce Ryan to verify this, and he stated that this EPROM set DOES allow writing and reading up to and including what he terms quad density, 1440 sectors per side for a total of 2880 sectors per disk.

This upgrade is going for \$45 for the set of two EPROMs that are required, from either RYTE Data or T.A.P.E. Ltd. It has occurred to me that the EPROM set available

from these two companies might not be identical, so it would be wise to call them in advance to verify exactly what you are getting.

In either case, installing these in your TI disk controller card will require desoldering the old ROMs and removing them from the card, soldering in sockets for the new EPROMs, and inserting the new EPROMs into the sockets. This is NOT an easy job for a technoklutz (a term I shamelessly borrowed from one of the Compuserve TI Forum Sysops who claims to be one). If you are not already experienced at this kind of thing, you should look for someone to assist you. MSP99 has several members who are capable of making an installation of this type and who might be talked into helping if anyone wants to try it. RYTE Data has advertised that they will install them for you for \$10 if you send them your card. RYTE Data is located in Canada, however, and they have experienced some customs delays on returning cards that have been sent to them for modification. They were amazed by the number of calls they have been getting about this, and they are still in the "tooling up" stage, so don't you be amazed if it takes a little while for delivery.

Ryte Data  
210 Mountain Street  
Haliburton, Ontario K0M 1S0  
Canada  
(705)457-2774

T.A.P.E. Ltd.  
1439 Solano Pl.  
Ontario, CA 91764  
(714)989-9906

**NOW - OUR OWN CLONE:** I guess it had to happen - TRITON Products Company has announced a TI99/4A linked IBM XT clone. Not TI99/4A compatible, you understand, but linked.

What has happened is that MG (formerly Miller's Graphics) has developed, at the request of Triton and for distribution and sale by Triton, a device that plugs into the I/O port on the side of your beloved 99/4A and lets you control and operate their PC XT clone using the TI99/4A keyboard. This "bridge box", as it is called, has input sockets for both the TI and the XT video outputs, and output sockets for cables connecting to your monitor and the XT keyboard input.

The bridge box is not sold

separately - it comes packaged with Triton's TURBO XT clone. What you actually get is:

- 1) Turbo XT clone, 4.77/8MHz switchable, with 8 expansion slots.
- 2) 640K motherboard with 256K memory actually installed.
- 3) Color Graphics adaptor (CGA) - produces both composite and RGB video output.
- 4) Floppy disk controller and 1 DS/DD half height drive.
- 5) Parallel printer port on the motherboard.
- 6) The bridge box which lets you control all this from your TI99/4A.
- 7) Cables to connect all the pieces together.

If you don't recall seeing a keyboard in the list of items you get, that's because none was listed in the official announcement. They have apparently worked out all the necessary keystrokes needed to emulate the XT keystrokes from your TI99/4A keyboard. You can run both your TI and the XT from your TI keyboard, switching back and forth between them by using Basic or Extended Basic calls to get into XT mode or keystroke combinations to return to 4A mode.

All this will cost you \$499 plus \$19.90 shipping and handling. The main advantage I see in this device is that you can use both your TI and your PC clone with the same monitor. I don't consider the use of the TI keyboard with a PC clone to be all that great, but I suppose it does save a buck or two. MG has assured us that you can indeed use this combination with your current composite monitor or TV, even much of the 80 column stuff running on the clone. They do warn that for best reading, turn off the color.

Personal opinion? If I wanted a PC clone, I would not want to have to use my TI99/4A keyboard with it. Of course, you can get a regular keyboard to use with this product, too. I'm not sure whether Triton will offer them, but you can always shop around and find one you like some other place - there are plenty available in all styles and prices. And speaking of prices, the price for the TRITON Turbo XT package may not be the best that can be found for a PC clone, but it is not bad, and does have the advantage of having a couple of the better names in the TI market behind it.

Triton Products is the company to which Texas Instruments turned over the marketing, etc., of all their 99/4A related products when they pulled out themselves. If you don't already have it, you should write for Triton's colorful catalog of products for the TI99/4A user.

Triton Products Company  
P.O.Box 8123  
San Francisco, CA 94128  
(800)227-6900

GRAM KRACKER BITES DUST: It has been confirmed that MG will no longer produce the Gram Kracker, ostensibly because they could not maintain their price structure due to rising costs of components, etc. There has been some discussion of production being picked by another company, possibly Triton Products, but there is nothing firm on that score yet. If you are interested in the survival of the GK as an available product, it might not hurt to write Triton (whose address is listed elsewhere in this column) and let them know of your interest.

In the event that the GK does not get picked up by someone else, you still have various other options available. Maximem, a somewhat less spectacular device boasting capabilities similar to the basic Gram Kracker (but without its own cartridge port), is still available and less expensive than the GK. And of course, those who have followed this column are aware that the Mechatronic Gram/Ram Card, which plugs into the P.E.Box and contains more memory than even the expanded GK, is still available, although it is more expensive.

GRAM/RAM NOT AT FAULT: Speaking of Gram devices, and the Mechatronic Gram/Ram card in particular, my face is a little red this month. In the last column I mentioned a problem that I was having with my GRC, purchased from Ryte Data.

I have since discovered that my problem analysis was faulty, or at least incomplete. The trouble was NOT with the GRC at all, but was instead caused by a problem with my hard disk drive. I had reloaded the GROM dump files used by the GRC when my problem originally came up, thinking that perhaps one of the files had gone bad, but it had no effect on the problem.

However, when I discovered other unrelated file problems occurring,

I reloaded the GRC file contents to different file names, so that they would be written to different physical space on the drive, and discovered that the GRC worked correctly once again. When I had originally reloaded the files, I had just copied the data back onto the original files.

This discovery caused me some consternation, as my first thought was that the original file area must have gotten damaged. If this was the case, I was probably the victim of a "head crash", which could very easily result in some expensive repair or replacement of my hard disk drive. To verify this, I dumped the entire contents of the drive to floppy disks (lots of them!), initialized the drive and ran the complete set of Myarc disk diagnostics. No errors were detected, and not a single bad sector was flagged.

I scratched my head, reloaded my files and have had no problems since. The only thing that I can think of is that perhaps the directory pointers that link file segments together somehow got clobbered. I can imagine some possible ways in which such a thing could happen, resulting in the symptoms I saw. But it is all conjecture, and likely to remain so, as the problem is gone.

When I originally thought I had tracked my trouble down to the Gram/Ram card, I wrote a letter to Bruce Ryan of Ryte Data, explaining my trouble and requesting my card to be repaired or replaced. Bruce responded promptly by telephone. He made several suggestions and we discussed arrangements for the exchange of the GRC, which turned out to be unnecessary. He also sent (by special delivery!) several disks of software which he thought might be of help. They were of some help, although not in the way that he intended. It was while shuffling these files around that I discovered the problem that led me to the solution of my troubles.

SCANNING THE HORIZON: As a fortune teller, I don't think I could make it. Just about every time I make a prediction about the subject of the next month's column, things don't happen in the way I was expecting. This month was no exception, partly because I wanted to correct the bum

## HIDDEN CHARACTERS

by Steve Patterson  
NEW HORIZENS UG

Hidden Characters is a term that I have given for the use of characters in a file that are unable to be seen on most disk catalogs. These type of characters can be used in both programs and files, but there is a huge difference. With programs, they must have a keyboard input. With files, if you copy the program with a XB file copier such as my 'COPIER' then you can use any character ever imagined.

For program type HC I have only found one to this day. This is ASCII 127 or FCTN'V'. You can use this character at the end of a filename to make it hard for others to run the program because they cannot figure out how to spell it. They don't notice the last hidden character. Of course you can use more than one and they don't have to be at the end. You could put one in the middle, or you could have the entire filename be character 127. Having it at the end makes it less noticeable.

Now how do you use ASCII 127 and possibly ASCII 1-29 in a filename. This is where you will have to have some XBASIC programming knowledge. Basically how to get any character at the end of a filename is to open that filename in XB, then open a new file with a couple of hidden characters at the end of the filename. Then read each record of the file and save it to the new file. So you have actually copied the file itself and in the process you have added several invisible or hidden characters at the end of the filename. With the possibility of having any character from 1-29, you and only you know the character preset at the end.

So, say you have a filename like "DSK1.LIST" you can change that normal and easy to read file into the almost impossible to open file:

```
"DSK1.LIST"CHAR$(2)CHAR$(25)"
```

This portion will place a ASCII Char #2 right after the 'T' in the name. It will not be able to be seen on most catalogs but you will know what it is because you wrote it down somewhere safe. One



## The Assembly Line

### EDITOR-ASSEMBLER DISCOVERY

by Danny Michael

Reprinted from the SHGALS 99ERS  
newsletter.

I've recently been doing some explorations in the assembler program, and I have uncovered a mistake in the program. As you know any device name entered for the source, destination, or list files must be followed by a period or you get an error message. The reason for this is a mistake in the DSRLNK routine in the assembler. This is the routine that is internal to the assembler program, NOT the routine that your assembler program uses when you REF DSRLNK. The assembler uses a modified VSBR routine that returns the requested VDP data in R0 instead of R1.

The person who wrote the DSRLNK for the assembler must have temporarily forgotten this, as the section of code that retrieves the filename length looks to R1 for the value returned from a call to VSBR. This results in the program using an incorrect name length when scanning for the device name. Since this routine exits when it encounters a period, we can avoid the error by appending a period to the device name, ie, 'PIO'.

This works, but it is annoying since it is the only program that I use that requires that you do add the period. Fortunately, this error is fairly easy to correct. It involves changing ONE byte in the ASSM2 file on your E/A disk. To make the change, you'll need a disk sector editor such as DISK+AID, DISKO, or ADVANCED DIAGNOSTICS. Be sure that you're working with a backup copy of the ASSM2 file, just in case...

First, find out where the ASSM2 file is located on the disk. If you've copied this file to a blank disk and you're using a TI or Cor Comp disk controller card, it should begin at sector >22.

Next, find the 8th sector, in the file. You can arrive at this sector by adding 7 to the beginning sector number. In the

8th sector, beginning with byte >88 (counting from zero), you should see this sequence: 04 20 aa be 00 00 d1 c1. If you do not see this sequence of numbers, you are looking in the wrong sector. It is the last byte (C1) in this sequence that needs to be changed. Change it to C0, then re-write the sector to disk. Using this modified assembler program will eliminate the need to enter the period after a device name where a filename is not used.

One other tidbit about the assembler... If you assemble a source code file that contains a TITL directive to print a title on your assembler listing and then assemble another file without re-loading the assembler, the previous title will be used for that program unless another TITL is given. This is because the title buffer is not reinitialized when the assembler executes. Not exactly a useful discovery, but interesting.

\*\*\*\*\*

### SLOWING FAST DM 1000

by Louis Guion

Condensed from: NET 99er HCUG  
newsletter

The newest version of DISK MANAGER 1000 (DM 1000, Version 3.1), suffers from the previously known defect of having any key which is depressed and held for only a moment, repeating several times before you can get your finger lifted from the key. Well, you can fix it anytime you like, and set the repeat action just as fast, or slow as you want to make it.

You must have a single-sectoring program like DISKO or DISK+AID. Copy the file "MGR1" of DM 1000 to a BLANK disk. You should have only the one file on the disk.

Now, load your DISK+AID and either go to sector >36, or have the program search for the HEX string of 06 03 16 F9 03 80 00 A0 FF 00 C0 1D. The important bytes are >42 and >43 which are the 00 A0 in the string above. This is 160d decimal. You want to change this 160d or 00A0 to another value which will slow down the repeat key. The range of acceptable values will fall between 160d to 2000d or HEX values >00A0 to >07D0.

# The BASIC System



by John Hedstrom

(Reprinted from the Northern  
NJ 99ers group newsletter)

This is a simple program to title VCR tapes. It allows six lines of text on rows 5, 8, 11, 14, 17 and 20 with 28 char's per line. To skip a line, press ENTER and to print a quotation mark, type three consecutively (""). The program centers each line and draws a border resembling a film strip.

Hook up your computer to your VCR via the VHF antenna input (with modulator cable and VCR set to tuner) or via the Video In input (with monitor cable and VCR set to line) and the title screen can then be taped for any length of time.

```

100 REM VCR Title Screen
110 REM by John Hedstrom
120 REM Dec. 3, 1984
130 CALL CLEAR
140 INPUT "SCREEN COLOR?":S
150 INPUT "BACKGROUND COLOR?":F
160 INPUT "LINE #1?_":L1$
170 INPUT "LINE #2?_":L2$
180 INPUT "LINE #3?_":L3$
190 INPUT "LINE #4?_":L4$
200 INPUT "LINE #5?_":L5$
210 INPUT "LINE #6?_":L6$
220 T1=(30-LEN(L1$))/2
230 T2=(30-LEN(L2$))/2
240 T3=(30-LEN(L3$))/2
250 T4=(30-LEN(L4$))/2
260 T5=(30-LEN(L5$))/2
270 T6=(30-LEN(L6$))/2
280 CALL CLEAR
290 CALL SCREEN(S)
300 FOR C=1 TO 12
310 CALL COLOR(C,F,1)
320 NEXT C
330 PRINT TAB(T1);L1$:::TAB(T2)
      L2$:::TAB(T3);L3$:::TAB(T4);
      L4$:::TAB(T5);L5$:::TAB(T6);
      L6$:::
340 CALL HCHAR(1,1,30,32)
350 CALL HCHAR(24,1,30,32)
360 CALL VCHAR(1,1,30,24)
*****

```

To easily eliminate or change that annoying "BEEP" prompt when using input statements, place a positive duration CALL SOUND statement immediately before the input. Using a very high frequency (which the TV speaker does not respond to) and the softest sound level stifles the

"BEEP" completely.

```

10 CALL SOUND(400,20000,30)
20 INPUT X$

```

If you wish to change the "BEEP" tone try experimenting with this:

```

10 CALL SOUND(200,[FREQ],
      [VOLUME])
20 INPUT X$

```

The positive sound duration in CALL SOUND means that the TI will keep playing the sound for the specified time while it executes subsequent statements. Apparently, this overrides the built-in "BEEP" tone used in the INPUT statement in BASIC and XB. Experiment with the sound duration. Depending on the length of the program, make sure that the CALL SOUND is still playing when the INPUT is executed.

\*\*\*\*\*

Here's an automatic word wrap from the Pittsburgh UG. Use the sample program to illustrate the effect.

```

6980 REM USES W$ FROM MAIN
      PROGRAM
6990 REM USES THE VARIABLES
      L,Y1,B$(1-4)
7000 Y1=28
7010 L=LEN(W$)
7020 I=1
7030 B$(I)=W$
7040 IF L>Y1 THEN 7070
7050 PRINT B$(I)
7060 RETURN
7070 B$(I+1)=SEG$(B$(I),
      I,Y1)
7080 B$(I+2)=SEG$(B$(I),
      Y1+1,L-Y1)
7090 IF SEG$(B$(I+1),Y1,
      1)=CHR$(32) THEN 7140
7100 B$(I+2)=SEG$(B$(I+2),Y1,
      1)&B$(I+2)
7110 B$(I+1)=SEG$(B$(I+1),I,
      Y1-1)
7120 Y1=Y1-1
7130 GOTO 7070
7140 PRINT B$(I+1)
7150 I=I+2
7160 L=LEN(B$(I+1))
7170 Y1=28
7180 IF L>0 THEN 7040
7190 RETURN

```

```

-----
100 REM SAMPLE MAIN PROGRAM
110 CALL CLEAR
120 W$="THIS IS A TEST. This a
test. See what happens with a very
long word such as 'hippopotamus'."
130 PRINT W$:::
140 PRINT "NOW, SEE THE AUTO
WORD WRAP:":::
150 GOSUB 7000
160 END

```

## MSP 99 NEWS XXXXXXXXXX

Editors Note: The following list of items has been compiled from several sources including many of our exchange newsletters.

Several noteworthy items this month. To begin with, Myarc is reportedly coming out with a new hard disk controller card for inside the PE Box. (Their older version was actually two cards.) It will support up to 60 Megabytes on 2 Winchesters, DMA and an interrupt based I/O. The price, according to Lou Phillips, will be "Marginally more than a DSDD Disk controller." For more information:

Myarc  
P.O. Box 140  
Basking Ridge, NJ 07920

Ryte Data is reported to be planning to market an expansion box with space for up to 5 cards. The expansion unit would also accomodate 4 horizontal disk drives. For more information:

Ryte Data  
210 Mountain St.  
Haliburton, Ontario Canada

John Dow, of Dow-4 Gazelle Flight Simulator fame, has announced plans to introduce a "true flight simulator with 360 degree panoramic graphics for visual flight simulation." No address or further information is available at this time, but I'll be sure to keep my eyes open for this one.

Speaking of flight simulators, in a previous issue of MICROpendium is a report on a program called the "Spad Flight Simulator". The setting is France during WWI. The program is reported to offer "true" flight simulation with complete acrobatic control and a 360 degree panoramic in flight view screens. For the expert pilot is a battle mode.

The program should be out already and selling for \$29.95. It requires 32K Memory, disk drive and E/A. To order or for more information:

Not-Polyoptics  
P.O. Box 4443  
Woodbridge, VA 22191

Are you in need of technical data for your TI? Like to get ahold of some schematics? TI has them and you can get a copy by going right to the source. Here's a partial list of what's available:

Schematics:	DWG.NO.	PRICE
Stand Alones		
RAM Expansion	1041336	\$2.50
Disk Controller	1040378	2.50
RS232	1037105	2.50
Cards		
RAM Expansion	1039330	\$2.50
Project 360	1039314	2.50
Power Supply	1033304	2.50
Disk Controller	1039340	2.50
RS232	1039308	2.50
PCB P-Card	1039317	2.50
Service Manuals		
99/4A Console	1049716.1	\$10
With PE System	1049717.1	15

There are also several pages of other parts for the 99/4A all available direct from:

Texas Instruments Inc.  
Attn: Dealer Parts  
P.O. Box 53  
Lubbock, TX 79408

Lost or worn out your manuals? I've got a list from an outfit that has replacements for just about everything TI ever produced. The list is too extensive to reprint here, but you can get a copy from:

HAC Labs Ltd.  
Helene LaBonville  
121 Camelot Dr RFD 5  
Bedford, NH 03102

Mechatronic of Germany has released its 80 column expansion system for the TI, enabling an 80 column by 26 line display. It is designed to show 256 by 212 pixels in 256 colors or 512 by 212 pixels in 16 colors with certain software. It plugs into the console's I/O port which means it is necessary to remove the old video chip from the TI and replace it with a flat ribbon cable. The manual documents how to do this. Once done, the video processor is outside the computer with a 192K byte RAM as VDP memory.

The 80 column expansion has a RGB output and a TTL sync, a combination with which most color monitors are adaptable. A special cable for black and white monitors produces the necessary SW composite signal. A modulator is available

for the color composite monitor or TV. The latter is not recommended for use in the 80 column mode. All program modules including BASIC, X BASIC, E/A, and TI-Writer will run with the 80 column expansion. It is also compatible with the Myarc 9640 computer. For more information:

T.A.P.E. Ltd  
1439 Solano Pl.  
Ontario, CA 91764

Millers Graphics has discontinued production of their infamous "GRAM Kracker" citing problems with deliveries "which was ruining our reputation." Craig Miller stated that MG will continue to support the TI market and pointed out a new PROM for the Cor Comp disk controller card and the GRAM Kracker Utility I written by Danny Micheals. Rumor has it that MG is also busily at work on a new IBM card for the TI 99/4A that will make the system IBM compatible.

On the same note. Triton has introduced a new hardware system for the TI. It consists of two pieces. The first, called a Bridge Box plugs into the side of the console and looks a little like a Cor Comp stand alone expansion box. The other looks just like an IBM expansion box complete with room for several disk drives. Together they make the TI IBM compatible.

According to the brochure, "The new Triton Turbo XT system gives you 16 times more computing power, bringing your TI up to 256K (expandable to 640K) of memory!" It features an 80 column display, an 8/4.7MHz clock (software selectable) one 5 1/4" DSDD 360K Thin Line floppy with 48 tracks per inch, 8 standard user accessible IBM PC card slots, MS-DOS, an RGB/Composite Color Graphics Display Adapter, and a 1 year parts and labor warrenty. The sidecar Bridge Box allows switching between the 4A and XT modes.

The price for all this is \$499 plus \$19 for shipping and handling. A package of special support software is also available for an extra \$69.95 to get you started using the XT. Also available is an extended warrenty for only \$99.95. For more information Triton has provided a toll-free number:

1-800-227-6900

**TIPS**

## 'n Thoughts

by Tom Fairbairn

In a couple of previous columns I have talked about the keyboard ID strips that I have made for myself and others, and I like to let others know about things I find to be useful. If you will bear with me, I will explain some of the reasons and what I have done to fulfill a need.

TI was very good about making sure that the keyboard ID strips, which I think may more accurately be called "programmable function key markers," were included with every program they sold that did not use the standard programmable functions for the top row of keys. TI neatly marked the strips with red and gray spots to relate the conditions that are shown on the strips to the use of the CTRL and FCTN keys that activate the special functions.

Unfortunately for some programs, the TI strips only provide for the programmable functions that are related to the top row of keys. As it turns out, some programs use CTRL functions of the other keys, and/or FCTN definitions for the remaining keys besides the ones that provide the characters that are "missing" from the normal keyboard.

There is also a considerable bunch of disk-based software out there that could benefit from proper ID strips and do not have them. Two that immediately come to mind are the TE 3 program from our own library, and the PLATO emulator I use when I have signed into the system from home.

I finally decided that trying to use the blank strips that TI sent along with the machine didn't make it. First off, I prefer something more elegant than my sloppy printing; secondly, the TI blanks did not allow for situations (such as the terminal emulator) where a lot more than just the top row is programmed for additional functions.

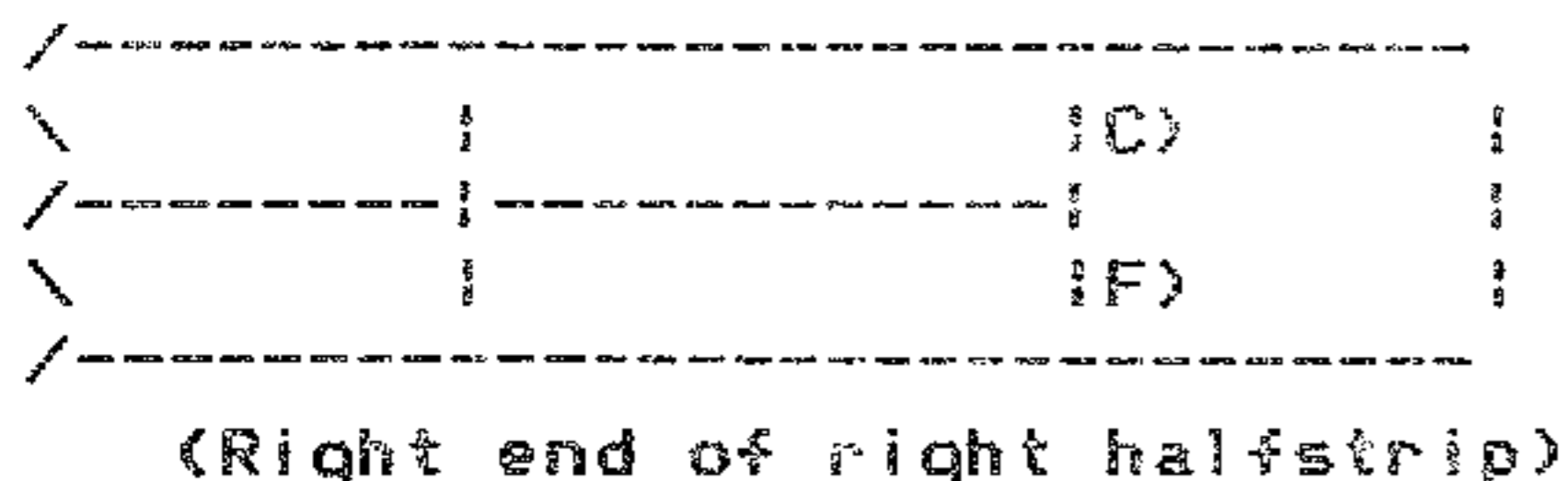
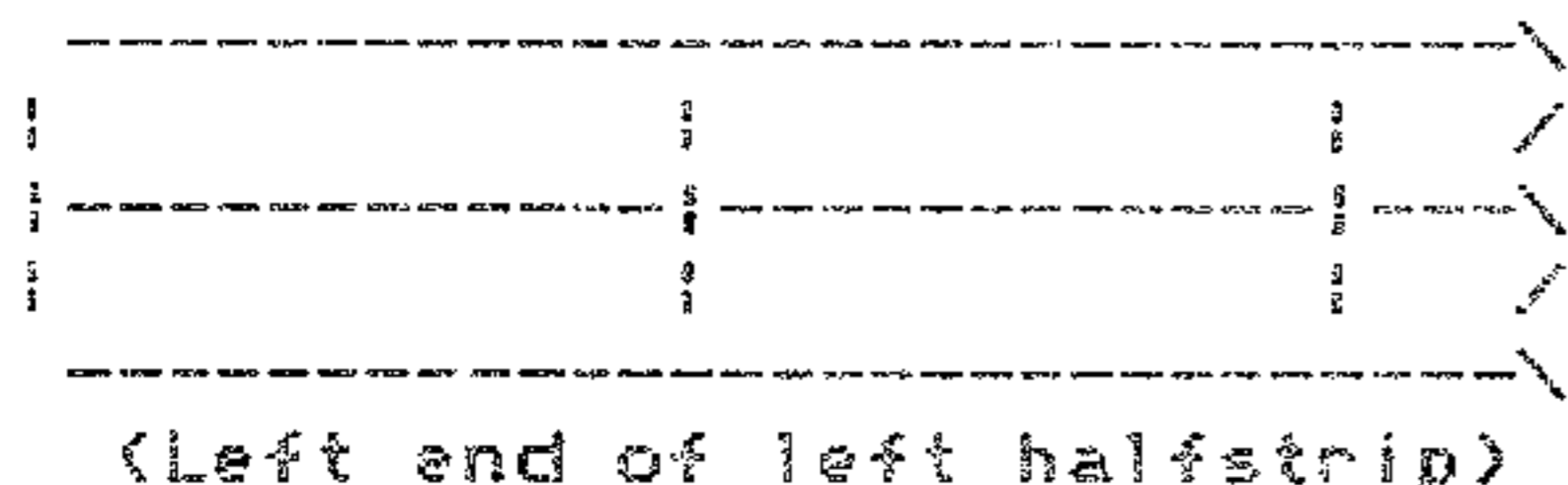
Now, I am fortunate enough to have bought a dot-matrix printer (a STAR Gemini 10-X) that can be programmed to do some very fancy activities

using the TI-Writer formatter command .TL, or TRANSLITERATE. I can tell the printer to change the characters per inch setting or line spacing to any increment of 1/144th of an inch that I want, turn solid line underscoring on and off, start and stop double-wide printing, and so forth. If you own just about any MX-80 compatible, including the TI Impact printer, you will have some of these abilities available. Run and get the manual for your machine while I wait on top of your coffee table, and you can compare your machine's command structure to mine during the following discussion.

For all of my special and the more frequently used documents, I set up a ruler document that I read in any time I'm writing a document in that special format. To make the TI strips, my ruler document looks like this illustration.

First off, the tabs for the document are set to the first and last positions I can have on the page (00 and 79). Next I use this group of control statements.

```
.CO RULER4 SPECIAL RULER
.CO FOR TI KEYCODE STRIPS
.CO 1/2 OF STRIP PER PAGE WIDTH
.CO 11 CHAR/ENTRY LINE/FIELD
.CO 1 ENTRY LINE/FIELD
.CO 2 FIELDS/SEGMENT
.CO SET \=FORCE COMPRESSED PRINT
.TL 92:27,15
\
.CO SET \=FORCE FEED TO 15/144
.TL 92:27,51,15
\
.CO SET ==FORCE SOLID LINES
.TL 45:241
.CO SET \=DOUBLESTRIKE
.TL 92:27,71
\
.CO SET \=UNIDIRECTIONAL PRINT
.TL 92:27,85,1
\
.CO ENTER THE DESIRED DATA
.CO BETWEEN VERTICAL BARS IN
.CO FIXED ENTRY MODE (OPEN CUR-
.CO SOR). DON'T OVERTYPE BAR.
```



The left halfstrip has room for the data of the left six top-row keys; the right halfstrip holds the data for the remaining five keys and the CTRL/FCTN identifiers. Because I have no way to print the color dots (\*Sigh!\*) I had to resort to the subterfuge of using letters. The name of the program that uses this strip goes into the blank area to the right of the letters. You can have up to 11 characters per box.

Now let us look at what the transliterate commands do for us. The command .TL 92:27,15 causes the ASCII code 92 (the \) to be converted to the ASCII string 27 (ESC) 15 (SI or shift in) before it is sent to the printer. That combination tells the printer to set the 17.5 character/inch mode for printing. As soon as this is set up, I then "print" the \ character, which accomplishes the action.

The next step uses .TL 92:27,51,15 to change the \ to a new meaning, 27 (ESC) 51 (numeral 3) 15 (number of increments). The combination tells the printer to move paper 15/144ths of an inch each time it receives a linefeed from the system. The normal spacing at 6 lines per inch is 24/144 inch. Again, the control string is sent out immediately. By this time, you have noticed that I can use the same character over and over to send the controls by always sending it as soon as it is redefined.

The next transliterate is a little different. This one changes the dash (or minus) character to a wide underscore. I did this due to the dash being easier to find with a touch than the underscore on the TI. If I have to add boxes to make a 3 row or 4 row strip, it is more convenient. Why not let the program do the work for you? Isn't convenience one of the reasons you paid for it??!

The next .TL causes the printer to print in doublestrike mode. In this mode, the printer prints the line, then moves the paper 1/144 inch down and prints the line again. It thickens the lines that make up the characters and fills in the tiny gaps between pin marks, giving a smoother look to the characters. I had to do it this way rather than the emphasized mode (side-by-side offset) because my printer can't do emphasized in 17 characters per inch mode. For this

purpose, double-strike works as well as highlight. Because this is sent for each dash character, I don't want to send it right away.

The next .TL sets unidirectional print mode. My printer is logic seeking and prints alternate lines right to left and then left to right. When printing right to left, the print points are offset roughly 1/144th inch horizontally. They tell me this has to do with the way the printer senses where to put the little dots, and is needed for highlight print, but it bothers me to see on supposedly straight vertical lines. So I force it to always print left to right. The arrangement of the blank strip is shown in the diagram.

The blank strip is in two halves. Each half is almost 80 characters, and TI-Writer won't allow over 80 columns on a line. (\*Sigh!\*) It would be mighty nice if I could get a whole strip crosswise on an 8 1/2 inch wide page, but it misses by about an inch. So I have to print it in two parts, and then cut out the sections, glue them together the long way of a typewriter sheet, and copy it on the dry copier. Then I cut out the copy, trim it, and plasticise it.

By using this method, I've been able to make up special strips for programs taken out of magazines, to build my own strips for such things as my PLATO emulator and my FORTH Kernal, and make replacement strips for some folks who had lost theirs (or, in one case, had the dog chew it up!!).

Now there are some other needs, as well. Below you will find some examples of other strips I have made that I prefer to the TI ones. The TI-Writer strip is 3 lines high and adds definitions of the special key functions using CTRL and six letter keys that are not copies of functions provided by the top-row keys. If they are not on the strip, I forget which ones are which. This saves me some time when I'm working with TI-Writer. This maintains the standard block alignment.

```

-----\
|K=DLT TO EOL|L=HOME CURSR| T=BA/
|-----|-----|-----\
| OOPS! | REFORMAT | SCRNL/
|-----|-----|-----\
|DELETE CHAR|INSERT CHAR|DELET/
-----\

```

(Left end of left halfstrip)

```

/-----\
\ICATED FUNCTIONS |C) |
/-----|-----| TI- |
\RD WRAP | |C) |
/-----|-----| WRITER|
\E NUMBERS| QUIT |F) |
/-----\

```

(Right end of right halfstrip)

The second example, which shows my Terminal Emulator II strip, is unlike anything TI ever did. First, it is four rows high instead of two. Secondly, each row represents a row of keys on the keyboard, and each row on the strip is offset to match the offsets of the corresponding keys. A couple of keys are marked for both CTRL and FCTN interpretations, because that's how they work with this cartridge. In my case, this is a double side strip as well, because I have the strip for ASCII PLATO on the back side of the conventional TE II key strip.

```

-----/
|* SPEAK *|* OUTPUT *|* CA\
-----/
| X-ON/DC1 | ETB \
-----/
| SOH | X-OFF/DC\
-----/
| SUB | \
-----/

```

(Left end of left halfstrip)

```

\-----\
/ EXIT *| GS |C) |
\-----|-----| T/E-II|
/ | DLE | BRK|C) |
\-----|-----| TERMINL|
/ | FS | CRIC) |
\-----|-----| EMULTR|
/ ESC | |C) |
\-----\

```

(Right end of right halfstrip)

Of course, these don't look as they would formatted for actual printing. The actual strip is the same physical size as the standard TI product if it is one of the two-row versions.

So if you have a printer (a-a-ah, the beauty of dot-matrix) that can handle high-resolution printing and you need some new or customized programmable function key strips, you now know how it can be done. They do end up looking very professional, if a little care is used with the centering in the boxes and the abbreviations. I would really rather not get into the business of making strips, but

RAMDISK REVIEW....cont. from Page 1  
Horizon also supplies a copy of DM-1000 from the Ottawa TI User Group. DM-1000 is a disk manager with many features. I cannot even start to describe the program so I will just say it is included.

I purchased my Ramdisk as a bare card for \$50.00. For the \$50 I got a nice printed circuit board, three diskettes, and a 39 page manual. The quality was quite good and nothing was left out. I feel that \$50 is a reasonable price for what I recieved, however for those who do not have the desire to build their own card Horizon also sells completed cards for \$165 or \$210 depending whether it is 104K or 192K. They also sell a complete parts package for \$110 which is a very good price as the memory modules cost about \$3 each and the rechargable batteries cost about \$10. However instead of doing it the easy way I decided to scrounge up my own parts and save a few dollars.

The memory modules were ordered from a mail order outfit for \$76 and the rest of the parts came from my old parts collection or from the scrape bin at work. The plans call for some stange parts like 1N34 diodes, these are Germanium diodes designed by Westren Electric in WWII. Instead of using these old style diodes I used some 1N914 diodes. These diodes are used in a circuit to 'OR' two signals together and I feel that Horizon really should have used a real logic gate instead.

Normally I do not uses sockets for permanent circuits as they can only cause bad connections and trouble, but since the memory modules are expensive parts I used sockets for the memory part of the circuit board.

It took about two hours to build the card including making some odd parts fit and some other small changes. Since my TI99 system does not have a PE box but instead uses the old stand-alone boxes, I needed to make a single card PE box. This took another evening and also the Ramcard has one output which is not on the console output bus. At the November club meeting I found that the signal is used to gate a driver on the bus somewhere in the PE box and I did not need it. This circuit also used the 1N34 diodes so I do not know how good the diode

logic works.

The insrtructions say to install one memory module and run memory test on that one memory. I did that and sure enough I got memory errors. The first module from the tube was bad, just a few addresses failed and then only on one pattern. After messing with several things I realized it was a bad module and not my work on the Ramcard. The supplier has since replaced the part and everything is O.K.

One other change I made was to replace the rechargable batteries with standard Alkaline batteries. The total current draw in the standby mode is about 20 microamps so the alkalines should last about 3 years. The plans call for three rechargables which gives about 4.2 to 4.5 volts which is too low for good reliablity operation. I used four batteries and a 1.2 volt regulator to generate 4.8 volts for standby operation.

I am very happy with the operation of the Ramcard as it is easy to use and makes the system operate much faster. A system with the Horizon Ramcard is almost as good as a system with a hard drive. The main difference is that the Ramdisk must be periodically dumped to diskette and the old files deleted to make space. My three sons all use this system for their homework and the Ramdisk fills up in about a month so it should not be a problem to manage the space on the Ramdisk.

The Ramdisk can be made to respond to any drive number from one to six by doing a Call Dn(x) where x is the desired drive number. Most of the time the Ramdisk is set to drive number 1. This is so that TI-Writer goes to the Ramdisk first and loads faster. Also at power on time the system goes to Ramdisk for the autoload record and does not waste time with the autoload record.

As a complete package the Horizon Ramdisk is an excellent value and it does what it is designed to do without causing the user to learn alot of new procedures. It also gives the advanced user several new options. Other then the use of diodes for logic functions, the design is quite good and should operate reliably. The file for this letter can be loaded from the Ramdisk in about 4 to 5 seconds.

TIPS.....cont. from Page 14

I'd be glad to help anyone out that needs it in doing their own. I will also be glad to copy my base files to your disk if you want to copy any of my strips directly. I'll bring samples of my masters for the strips I have made to the meetings if anyone is interested.

As an aside, I don't know of very many home computers (and darn few professional models!!) that sport a maximum of 22 programmable function keys as this TI does. There are 11 keys across the top row, and each can have two functions (one for CTRL, one for FCTN) defined for it! That is a very powerful capability. For that matter, each of the lower three rows can have at least a CTRL function programmed, making this a very versatile machine.

POOR RICHARD.....cont. from Page 8

rap I had hung on the GRC, but also because of new developments. Hang in there, though. I still plan to do a column on the subject of the development of random access mass storage over the years, but it will either have to be some month when there is not much other news on the TI peripheral front, or possibly as a separate article altogether. In either case, it will have to be another time, as it didn't happen this month! Keep those 99/4A keyboards clicking!

MSP99

HIDDEN CHARACTER...cont from Page 8  
bad thing about this process is that you can't later load this file into any program without changing it back to normal or going in and changing the OPEN statement so the hidden characters are present in the filename. So you would not want to put a hidden character at the end of a filename that you will update every day. Only on certain files you only want to see and will not be updated very much at all.

For those of you who are not to clear on what kind of program will add hidden characters at the end of a filename read on.

```
100 OPEN #1:"DSK1.LIST", INPUT,
DISPLAY, VARIABLE 80
110 OPEN #2:"DSK1.LIST"CHR$(4)
CHR$(16)CHR$(23), OUTPUT, DISPLAY,
VARIABLE 80
120 IF EOF(1) THEN 160
130 LINPUT #1:A$
140 PRINT #2:A$
150 GOTO 120
160 CLOSE #1
170 CLOSE #2
180 END
```

This program will give you a copy of the file LIST with three hidden characters at the end of the file. These characters being ASCII 4, 16, and 23.

Hope you find this new and experimental process of locking up files of some use and of some help in keeping away the unwanted.

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TIME SENSITIVE MATERIAL  
POSTMASTER - PLEASE DELIVER PROMPTLY