THE GUILFORD 99°ER NEWSLETTER

Bob Carmany, President   Joseph Martin, Newsletter Ed.
Carl Foster, V. Pres.   George vonSeth, Program Lib.
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OUR NEXT MEETING

DATE: April 2, 1985
TIME: 7:00 P.M.
PLACE: Glenwood Recreation Center
       2010 S. Chapman St.

        GOOD NEWS!!! Bob Carmany has
informed me that we now have a
permanent meeting place! We will be
meeting at the Glenwood Recreation
Center at 2010 South Chapman Street
in a room that will reportedly
accommodate 75 to 80 people. We
will retain our traditional meeting
time of 7:00 to 9:30 pm on the
first tuesday of the month.
        In addition to providing us a
meeting place the recreation center
will also provide adver- tisement
for our group, and all this at no
charge!! The only stipulations
are:
1) That the recreation center be
considered as co-sponsor of the
group, and allowed to advertise
itself as such. And:
2) That all group funds be used
only for the operation, and
activities of, the users' group.
(Which is exactly the way it
already is.)
        To find the center, go to the
colesium on Lee St., and turn onto
Chapman St. where it runs beside
the colesium. Follow it on past
the colesium until you reach Box
No. 2010, and you're there.

APRIL MEETING AGENDA

At he April meeting we will
continue the topic that was started
in January by demonstrating some
real estate and loan programs.
These programs will actually be
from the club library and so will
be specifically for your T.I.
computer. The club officers have
made arrangements for you to copy
programs presented at meetings on
to your tapes and disks when the
meeting is over. So bring a blank
tape or disk with you to all the
meetings and copy any program that
you want for your personal use and
enjoyment.

                        Dave Cohen
                        Program Chrmn.

        Have you ever wondered what
kind of "noises" that your computer
will make? We all know that it will
play music, but what about the
sounds that are also built in?
Well, this little program will let
you run through them.

```
100 FOR Z=-1 TO -8 STEP -1
110 CALL CLEAR
120 CALL SOUND(1000,Z,0)
130 CALL SCREEN(-Z+2)
140 PRINT "NOISE NUMBER ";Z
150 CALL SOUND (1,Z,30)
160 NEXT Z
170 GOTO 100
180 END
```

Another month has come and gone and it's time to plant "the Spring crops". Have you ever considered "computer-assisted" planting? Well, for those of you who are avid gardeners , a home computer can be a valuable aide to planning your harvest. The versatile PERSONAL RECORD KEEPING module can be adapted to store crop data and yields as well as a wealth of other information.

For those of you who are more advanced in programming in Basic or Extended Basic, you can even have the computer generate a garden plan if you give it the size of the garden and the types of crops that you would like to plant. One of the major seed companies, Northrup-King already offers this service--- for a fee of course.

If you are one of those people who procrastinate about paying their dues to "Uncle Sam", we hope that you found some tips in last month's meeting. The time to start using your T.I. for taxes is now!! That way when next year's tax time comes around, you will have all of your records ready to go and you won't have to spend long hours trying to get all those deductions together. Remember, the only real way to get to know how to use your computer is to get in there and compose some programs.

While we are on the subject of programming and learning, we might mention that the Basic classes will be concluding this month. There will probably be another offering later in the year and we are going to try to get together an Extended Basic class in the near future. If any of you are interested in going beyond what was covered in the Beginning Basic class, let Sandy Carmany know and we will try to get

together an Advanced Basic class that will cover file processing and other aspects of Basic that were not covered or just touched on lightly in the beginning class.

As usual, we are going to make our monthly plea for submissions to the newsletter. Joe Martin is doing a superb job in getting our newsletter out but I'm sure that he could use some help in the form of submissions. We would welcome any reviews, short programs, or programming tips that you would like to share with the club members.

Incidently, the problem of the lack of newsletter material seems to be a fairly universal problem. In talking to non-T.I. groups in the area, I have found that everyone seems to have the same problem --- everyone enjoys reading the newsletter but nobody wants to send anything in!! C'mon folks, HELP US OUT!!

This month's (or rather Vol. 5 No. 1) of HCM has some interesting programs and tips that you might be interested in. The last of the "Quiz Construction Set" programs "Quiz Print" is in this issue as well as the first in a series of outline and planning program called "The Organizer". There are also some tips in the "Tech Notes" section to enable you to run your Extended Basic programs and have them execute faster (see the EX Basic manual for more on turning the pre-scan off and on).

Well, this is getting a little longer than I had intended this month and I have a powerful urge to once again do battle with the Voritka Ugre in the "Wizard's Dominion" (I have yet to get very far) so I will end my ramblings until next month. Take care and may all your disks keep spinning!

Bob Carmany

The Miller diagnostics will run with only Extended Basic (An Assembler Load and Run version is also on the same diskette, but with no appreciable difference in load and execution speed).

A complete memory check is available and Miller claims that the software performs 963,072 memory accesses for this test (it is fast, that is why I lost count).

Aside from the diagnostics, Miller has packed a number of other "goodies" in with this disk. For one thing there is a disk format and verify routine that either works with a single disk, or there is a command file which will format a box of 10 in one sitting. Also included is a sector copying utility and comprehensive software to access, read and edit individual tracks and sectors on a disk (shades of Navarone's Disk Fixer). For this purpose there are complete edit facilities.

Summary: Which is the better of the two, or what are the relative strengths and weaknesses of these two diagnostics? Know-ware is unique in that it tests GROM's, video and speech. There are no tests for disk functions. Miller has all the disk tests that one could possibly ask for but does nothing specifically for GROM's, video or speech. So what is the choice: Miller is definitely a good buy for memory and disk tests and all the other utilities that come with it, definitely a good buy and one that is definitely recommended if the choice is limited to one (Experience shows that diskette drives are more prone to suffer from wear than solid state devices). The Know-ware software competes with Miller only to some extent but rather covers those items that Miller does not address. In short for a comprehensive system test both are highly recommended.

PRINTER SALES

Possibly of interest to anyone considering the purchase of a printer are two items from DAK Industries Inc. One printer of apparently exceptional value is the Olivetti PR-2300 Ink Jet printer, the retail price of which is $499, available for $199 + $8 S&H. The Olivetti prints at 110 cps on plain paper, and requires no ribbon. Instead of a ribbon it uses an Ink Jet ampule (Olivetti guarantees that the standard Ink Jet ampules are and will be available at Olivetti dealers nationwide).

In addition to quiet operation this printer also delivers consistent dot darkness from the first to the last dot printed from each ampule. Each ampule is good for about 150,000 characters at which time another ampule can be popped in in a matter of seconds (reportedly). Additional ampules can be ordered from DAK for $6.50 + $.50 S&h for a box of 4 ampules (600,000 characters).

These printers are a discontinued product line, hence the more than reasonalbe price. As we know from experience , this does'nt mean it's not a good buy!

I contacted DAK and was told that this printer is still available, but there is a two month waiting period for delivery.

DAK also has available with a two week waiting period the Gorilla Banana printer, which is manufactured by C.Itoth, for $129 + $8 S&H. This is a dot matrix impact printer which uses plain paper and prints 80 column width, upper and lower case (no true descenders).

If you are interested in more information on either of these printers or how to order them from DAK, see me at the next meeting, or call DAK at 1-800-423-2866.

Joe Martin.

FREE PROGRAMS

Here is a little gem of a
program that will help you figure
out exactly how much space you have
left on your disks without having
to use the DISK MANAGER module.
You can use it as a utility and
just keep loading disk after disk
into your drive and it will print
the information on the screen or on
both the screen and a suitable
printer. You might have to change
the printer OPEN statement to match
your particular printer. It is
currently set up for "PIO".

```
100 REM ************************
110 REM DISK MEMORY AVAILABLE
120 REM BY Chick De Marti 1983
130 REM ************************
140 CALL CLEAR
150 PRINT "PRESS (S) SCREEN ONLY":
:
160 PRINT " (P) COPY ALSO": :
170 PRINT " (ENTER) TO EXIT"
180 FOR ROLL=1 TO 6
190 PRINT
200 NEXT ROLL
210 GOSUB 380
220 OPEN #1:"DSK1.",INPUT
,RELATIVE,INTERNAL
230 INPUT #1:A$,J,J,K
240 IF AN$="P" THEN 250 ELSE 270
250 OPEN #2:"PIO",OUTPUT
260 PRINT #2:"-DISKNAME=";A$:
"AVAILABLE=";K;" USED=";J-K
270 DISPLAY "DISKNAME-";
A$:"AVAILABLE=";K;"USED=";J-K
280 PRINT
290 PRINT "-ENTER NEXT DISK:"
300 PRINT
310 IF AN$="P" THEN 320 ELSE 330
320 CLOSE #2
330 CLOSE #1
340 AN$="NUL"
350 GOTO 210
360 CALL CLEAR
370 END
380 REM **CHOICE FROM MENU**
390 CALL KEY(0,A,S)
400 IF S=0 THEN 390
410 IF A=69 THEN 360
420 IF A=83 THEN 440
430 AN$="P"
440 RETURN
```

Here is another disk utility
program. This one has appeared
several times and in several
different publications. It was in
the TI Owner Newsletter about two
years ago. If you SAVE this
program on each one of you
diskettes, you can have a catalogue
of the disk contents by RUNning the
program. Incidently, it takes up
only 4 sectors on the disk.

```
100 CALL CLEAR
110 DIM TYPE$(5)
120 TYPE$(1)="DIS/FIX"
130 TYPE$(2)="DIS/VAR"
140 TYPE$(3)="INT/FIX"
150 TYPE$(4)="INT/VAR"
160 TYPE$(5)="PROGRAM"
170 INPUT "MASTER DISK (1-3)?":I
180 I=INT(I)
190 IF (I<1)+(I>3)=-1 THEN 170
200 OPEN #1:"DSK"&STR$(I)&".",INPUT
,RELATIVE,INTERNAL
210 INPUT #1:A$,J,J,K
220 DISPLAY "DSK";STR$(I);"-
DISKNAME=";A$:"AVAILABLE=";K;"
USED= ";J-K
230 DISPLAY :"FILENAME  SIZE TYPE
P";"---------- ---- ---------- -";
240 INPUT #1:A$,I,J,K
250 IF LEN(A$)=0 THEN 330
260 DISPLAY :A$;TAB(12);J;TAB(17);
TYPE$(ABS(I));
270 IF ABS(I)=5 THEN 300
280 B$=" "&STR$(K)
290 DISPLAY SEG$(B$,LEN(B$)-2,3);
300 IF I>0 THEN 240
310 DISPLAY TAB(28);"Y";
320 GOTO 240
330 CLOSE #1
```

Out of the almost 450 programs that are in our library and currently ready to be checked out, it is inevitable that a good number of them be game programs. This month, we will once again look at some of the game offerings from our club library.

MINER

This program requires only the console. No memory expansion or joysticks are required. The object of the game is to dig through the ground and locate gold. You have to contend with rocks, springs, and other obstacles in your search to "share the wealth". Of course, the mining business is not exactly cheap and it does cost you money to dig your mine. The game comes with instructions and is fairly easy to play.

TERMITE

In this BASIC game, you are a termite trying to eat your way through a wooden block, however there are knots in the block that are indigestable. After you go into the block and run into a knot, the entire block and knots are displayed briefly before they disappear again and you are left to trust your memory to get through. There are several levels of difficulty and should keep you busy for a while.

TABLUT

This is a board game based on an old Icelandic game. It is similar to chess in that the object of the game is capture the king. The similarity ends there! It has instructions built in and should prove to be a real challenge. It is written in Extended BASIC.

There is a host of other games ranging from those suitable for the younger set to those for the most rabid arcade maniac. They range in quality from "near-poor" to excellent!

Of course, the library also contains programs for other interests as well. There is a speech program that will allow the user to explore the text-to-speech capability of the TE II module. With it, you can create voices of various pitches. There are programs that illustrate the us of sprites, 3-D graphics, music, and a broad spectrum of other utilities.

There is also a wide selection of technical and professional programs to help you do anything from designing electrical circuits to plotting and graphing applications. You can use the library to chart your finances, compute your taxes, and keep an inventory of your personal property.

With all of these (and many more) programs ready in our library, you really should get in touch with George von Seth and take advantage of what is available for your T.I.! Remember, it is one of the best deals around --- it's free to club members!!

Well, that does it for this month's column. If there are any requests about a specific software category that you would like covered, contact Joe Martin or Bob Carmany at this meeting.

This month we are going to discuss the T.I. produced MINI-MEMORY cartridge. This cartridge acts as a "mini expansion ram" as well as adding some enhanced commands to T.I. BASIC. It also will introduce you to Assembly Language.

The MINI-MEMORY retails for $99.95 but most of the mail-order houses have it for about $79.95. The package includes the module itself, an 82-page manual, the LINE-BY-LINE ASSEMBLER (with 20-page booklet), and a demonstration program called "LINES".

The cartridge contains an additional 4K of RAM, 4K of ROM, and 6K of GROM. The memory is battery-backed which means that the program or data stored in the 4K RAM is not lost when the cartridge is removed from the console.

For the purposes of this column we will be exploring the rather impressive enhancements that are built into the MINI- MEMORY cartridge and how they relate to T.I. BASIC and the 32K Memory expansion card (or stand- alone).

For file access and storage, the MINI-MEM recognizes three files: MINIMEM, EXPMEM1, and EXPMEM2. These three files are accessed with the same format as any other file and programs or data can be stored in any one of them with the SAVE command and retrieved with the OLD command. The file MINIMEM refers to the 4K of RAM in the cartridge itself and can be used for the storage of both BASIC programs and data, or Assembly Language programs. EXPMEM1 refers to the 24K block of high memory in the 32K memory expansion card which is now available for program storage from

BASIC with the use of the MM cartridge. EXPMEM1 is the 8K of low memory in the expansion card and is available for Assembly Language programs. So, with the MM cartridge and 32K attached, you have, in effect, a 24K RAM disk available to store your programs plus another 4K RAM disk for short programs. You can, for example, move a program from the VDP RAM into expansion memory with SAVE EXPMEM2. The program will stay in the 24K high memory expansion because BASIC doesn't recognize the existence of the expansion card. It will only be destroyed by over-writing the program or turning off the power to the PEB.

As if this wasn't enough, the MM cartridge adds several new commands to the BASIC vocabulary. CALL PEEK, CALL INIT, CALL LOAD, CALL LINK, CALL PEEKV, CALL POKEV, and CALL CHARPAT all become accessible from console BASIC with the cartridge plugged in. All of these routines are valuable for writing Assembly Language programs and directly reading and writing to both the CPU nd VDP RAM.

There is a detailed discussion of all of the enhanced commands in the 82-page manual. The only problem is that you are going to need the Editor/Assembler manual to fully understand what is going on. (Ed.Note: The Editor/ Assembler manual is available from Tenex for $12.95; Cat.# 15869)

The Assembly language portion of the cartridge includes EASYBUG which is an Assembly Language de-bugger (it is built into the cartridge) and the LINE-BY-LINE ASSEMBLER which allows the user to write his own Assembly Language programs into either the 4K RAM of the module or the 8K of low memory expansion.

Although not a true hardware item, the MINI-MEMORY cartridge does enable the user to make more efficient use of both console memory and the 32K expansion memory. The cartridge is well worth the investment and is really a bargain -- even at the retail price of $99.95. You might be able to find one at quite a bit less than the going price. It is one of the easiest ways to come up with an economical RAM disk!!!

Bob Carmany

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(The following review is reprinted with permission, from Vol.3 No.1 of CALL NEWSLETTER, the newsletter of the ATLANTA 99/4A COMPUTER USERS' GROUP.)

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QS WRITER

I just purchased a most impressive program. Let me say that this is not the first program I've purchased from "Quality 99 Software" and I've been very pleased with all the programs I've gotten from them. The nicest part about these programs is that I don't have to do a lot of work to get them to do what they are supposed to do. I can just load them and follow the screen directions.

The most interesting thing about this program is that it really doesn't do anything. It's a loader program, it only loads one program, and the program doesn't even come with it. So why do I like it? I like it because it will load and run TI-WRITER with the Extended BASIC module, or with the Editor/Assembler module, or with the Mini-Memory module. This way I can run TI-WRITER without changing modules, and is that ever a benefit. If you are thinking about purchasing this program the minimum equipment required is one of the above mentioned modules, a disk system, and 32K RAM. Anyone who wishes to be able to use TI-WRITER can purchase QS-WRITER, obtain the public domain version of TI-WRITER from the library and away you go.

The program has a few problems as I look at it. Number one is that it can only be used on the disk supplied by Quality 99 Software, which is single sided, single density, therefore if you have a double sided system, as I do, you are wasting half of a disk. However, even after you load the TI-WRITER programs onto the disk you still have over 200 sectors of disk space. I estimate that a two page letter will use 10 sectors, so you would be able to write 20 letters before you fill the disk, then you just transfer the files to another disk , delete the old files and start over again.

A second problem is that the program goes back to the color bars every time you want to switch from Editing to Printing to Utility. You have reload everything every time. This takes several extra steps that are not necessary when using the command module. The third problem , and one that I think is serious, is that you do not have the 'Show Directory' function of TI-WRITER. When you enter SD and hit 'ENTER' you go to the color bar screen and you have to reload the program, what's worse, EVERYTHING in memory is GONE. I can never remember the name of the letter I wrote last week and I miss that function.

The last problem I came across is when using DRAGON-SLAYER'S AUTO SPELL CHECK, for some reason, the use of small letters is lost. If you make a spelling error and use SPELL- CHECKER's correction function, everything you type in is in capitals and you have to go back into the Editor mode of TI-WRITER to change spelling corrections back to small letters. (continued)

(QS WRITER: continued)

(Ed.note: Since SPELL-CHECK requires that you reformat your document if corrections are made which change word lengths, this is not much of an added inconvenience.)

Even with the problems that I have described QS-WRITER is well worth the money, and does a fine job. If you, like me, are tired of swapping modules, or you have not been able to purchase a copy of TI-WRITER, this program is probably the answer you have been looking for.

This program can be purchased from
    Quality 99 Software
    1884 Columbia Rd.   #500
    Washington, DC 20009
    PHONE-(202) 667-3574
Or from your local or mailorder dealer.

                        Marshall Gordon

QS WRITER is available from Tenex for $34.95 + S&H.   CAT.# 32722

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At the last meeting George von Seth handed me a section of the USA TODAY, Tuesday, Feb.5 edition. It contained an article entitled "ORPHANED COMPUTERS, Filling the void when the maker bails out". The author, Anita Manning, was apparently prompted to write this article by Coleco Industries' recent decision to bail out of the home computer market. Coleco's bail out reportedly left 250,000 Adam computer system owners out in the cold, the same place we were left a little over a year ago.

After explaining the abandoned users' concerns, namely:
1.   Software availability.
2.   System expandability.
3.   Availability of repair

services.
Manning went on to say:

Those who have already been through the experience of having their computer suddenly orphaned offer solace to nervous Adam owners.

"If the Adam people do what we did, they'll be fine," says Terrie Masters, President of the L.A.   99ers, one of an estimated 270 active groups of owners of TI 99/4A computers, which haven't been manufactured since October 1983.

What they (TI owners) did was stick together.   TI user groups form an international network of TI owners who keep in touch through local meetings, newsletters and telephone lines.

For orphan owners, the group is vital--there is power in numbers.

TI owners say that several "third party" manufacturers are producing hardware--for the 99/4A largely because of pressure from users.

But when the software pipeline does dry up, computer owners fill the gap by creating their own programs; they don't copyright them, so others can use them free.

The article concludes with this reminder:

Of course, remember that even if your computer is discontinued, you can still process words, play games, learn algebra or balance a budget on it--the reason you bought it is still there.

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The following review is reprinted by permission from "99er ON LINE" the newsletter of the "Edmonton 99er Computer Users' Society", Alberta Canada.

FOUNDATION 128K CARD REVIEW

by: Danny Ochitwa

For those people who are thinking of adding more than 32K of memory to your TI-99/4A you're in luck! A company called FOUNDATION makes a card that fits into the TI Peripheral Expansion box and gives the user 128K bytes of random access memory to use. In order to better understand the function of the 128K card, a little knowledge of the TI architecture is required. The TMS9900 microprocessor (the processor that your TI uses) like other microprocessors can only directly access 64K bytes of memory. In the TI-99/4A the lower 32K (from 0 to 32,000) is used by the system. There are only 256 bytes of CPU usable RAM there; the rest is taken up by ROMS, DSR'S etc. The upper 32K (from 32,000 to 64,000) is your 32K memory expansion card which of course you can use. (NOTE: the 16K of memory inside the computer is in the Video Display Processor memory space and is not directly addressable by the TMS9900). The FOUNDATION card comes with four banks (chunks) of 32K bytes of RAM and a Device Service Routine in ROM. The first 32K bank behaves exactly like your TI 32K memory expansion card, the other three 32K banks (aprox. 96K) are inactive and are not seen by the computer. A small assembly language routine contained in the TI MINI-MEMORY MODULE could switch in and use any one of the four 32K banks thus using a total of 128K bytes of RAM. This process is known as bank switching and therefore the total amount of memory space that the microprocessor sees at any given moment is never more than 64K. For those of you who are jumping up and down in your seats and yelling "What good is this card to me, I don't know assembly anguage!!!", NEVER FEAR the Device Service Routine is HERE!. The FOUNDATION card comes with a DSR in ROM, which contains two assembly language programs, the first of which is a Disk Emulator Program (DEP for short). This program allows TI BASIC, XTENDED BASIC, and just about any other applications program to use the extra memory, by alloting the first 32K bank as your normal 32K of memory, and the remaining 3 banks as 32K, 32K, and 24K respectively as a psuedo RAM disk; the last bank is only 24K because the DSR uses 8k for house-keeping leaving a total of 88K of RAM to work with. The second program contained in the DSR is a small Memory Manager Module program (MMM for short) to manage the files and programs contained in the RAM disk. The DEP has various ways in which it stores programs and files. You can specify each of the 3 banks as MEM96A, MEM96B or EM96C (remember MEM96C is only 24K bytes) or you can specify the entire 88K by MEM96, or you can specify each of the three banks individually by DSKX.(filename). As you can see you can only store three programs or files in the RAM disk, one program or file per bank, or you can store a program or one large file in MEM96 using all 88K bytes. Here are some command examples that you could use in EXTENDED BASIC; let's say that you have a program or data in memory called TEST, you can:

SAVE MEM96, SAVE MEM96A (or B or C), SAVE DSKX.TEST, SAVE DSKX.TEST,MERGE, OLD MEM96, OLD MEM96A (or B or C), OLD DSKX.TEST, MERGE DSKX.TEST, RUN "DSKX.TEST", OPEN #1:"MEM96A" (or B or C), etc.

The Memory Manager Module (MMM) program allows you to delete, rename or clear any or all programs or files from the RAM disk; in addition it gives the file type and length. There is one other point that I should mention; when you first turn the computer on, you must initialize the RAM disk by issueing the command DELETE "MEMINIT". The word DELETE is not used in the same way as DELETE "DSK1.(filename)". The word DELETE is simply used to call in the DSR ROM; you are not deleting anything. To use the Memory Manager Module you would issue the command DELETE "MMM", then press FCTN BACK to return to the calling program.

In addition to TI BASIC and EXTENDED BASIC, the FOUNDATION card can be used with a variety of application software, such as TI-WRITER, EDITOR/ASSEMBLER, MULTIPLAN, TERMINAL EMULATOR II etc. Using the card with TI-WRITER, you could store a file in

each of the three banks, for example DSKX.LETTER, DSKX.STORY, & DSKX.MYFILE. Each of these files could be worked on during the course of a word processing session and later dumped to disk for permanent storage. The idea here is to use the greater access speed of Ram vs. Disk. Some application programs suggest that for ease of operation, two or more disk drives should be used. In this instance, the FOUNDATION card can easily substitute for a second drive and one package that illustrates this is TI-EDITOR/ASSEMBLER. Using the RAM disk, it is possible to store the source code, object code and listing in each of the three banks. An example of this might be to store the source code in DSKX.SOURCE, assemble and store the object code in DSKX.OBJECT and print a listing to DSKX.LIST; the only disk access needed is for the Editor and Assembler programs. When you have finished writing and debugging your assembly language program you can transfer the source and assembled codes to disk for permanent storage. Unfortunately not all software works as well with the RAM disk as EDITOR-ASSEMBLER and TI-WRITER. MULTIPLAN and the TI DISK MANAGER module both have one major drawback; you can only specify DSK1, 2 or 3; you can not specify DSKX, therefore, using these modules, you can print to the RAM disk but not store files or programs directly to it.

An interesting discovery was made concerning the transfer of DIS-FIX 80 type files from disk to RAM disk; you can use the PRINT option of the EDITOR/ASSEMBLER module to do it. When you get the FILE NAME prompt you can type DSK1.filename, and then on the DEVICE prompt you can type DSKX.(filename). This method can be used to transfer assembly language programs to the RAM disk and have them always on hand, thus eliminating the need to load them from disk every time you want to use them.

The FOUNDATION card is said to work with all TI and most third party hardware and software, but two exceptions have been found. The first is TI's TEXT-TO-SPEECH program which comes on diskette and the second is the new CORCOMP Disk ontroller Card. The latest word from CORCOMP is that a fix is on the way. Access time for the RAM disk seems to be on average two to four times faster than from a disk drive. This means that a program which takes 12 seconds to load from a disk will only take bout 3 to 6 seconds to load from he RAM disk.

I have tried to give a comprehensive look at the FOUNDATION 128K Memory Card, to help the reader decide if this piece of hardware is a worthwhile investment. Some people might claim that because they have not even begun to use up all the available memory they have, why should they invest in more? In my view, if you run any large application programs or do any serious programming, it is not how much memory you use but how you can use your available memory that counts. There are most likely many more programs that could make excellent use of the RAM disk and some third party companies ave already begun to design their hardware and software to use this extra memory.

If you were to order the FOUNDATION card it would cost you about $350.00 (duty, tax, etc. included). This is about the same price as a disk drive, which would give you greater permanent storage but would not be as flexible for program development. I should point out that the RAM disk is not meant to replace a disk drive but can substitute for one in many applications. If you are seriously thinking of upgrading your TI, the addition of the FOUNDATION 128K card is an excellent choice. Together with the 16K of memory in the console, your TI will have a total of 144K of memory, putting it on par with some of the best home computers n the market today!