

PUGET SOUND 99ERS
PO BOX 6073
LYNNWOOD, WA 98036

April 86

APRIL 1986 (YOUR NAME THE NEWSLETTER ENTRY COULD BE HERE!) Vol. 5 No. 04

OFFICERS

PRESIDENT :	CLARK WYHNE	745-3249	VICE PRESIDENT:	RICK LEWIS	568-0296
SECRETARY :	GEORGE SJAASTAD	522-1101	TREASURER :	DENNIS WOOD	641-0298
NEWSLETTER:	GENE CHRISTIANSEN	641-1032	LIBRARIAN :	JOHN UELAND	672-7593

NEXT MEETING

DATE : THURSDAY, April 24, 1986 TIME: 7:00 PM
PLACE: Kirkland Public Library, 406 Kirkland AVE, Kirkland

AGENDA: * Officer reports * Myarc 128K card demo-Roy Richards
* Question and answer session * LA Fest West Video
* Extended BASIC tutorial-Rick Lewis * General discussion session

MAY MEETING

DATE : TUESDAY, May 22, 1986
TIME : 7:00 PM
PLACE: Shoreline Public Library
345 NE 175th, Seattle

JUNE MEETING

DATE : Thursday, June 19, 1986
TIME : 7:00 PM
PLACE: Bellevue Public Library
11501 Main St, Bellevue

IN THIS NEWSLETTER

Minutes from the March meeting. 3

The President Says. 3

Financial Report. 4

Newsletter information. 5

Bits and Pieces 5

Queen of the Hill 6

Programming Techniques: Modular programming . . . 7

Function "UP" 9

TI Writer: New control U character set. 11

REVIEW: Fun-L-Writer. 13

GRAM Kracker Notes. 14

Additional stuff. 16

SOME LOCAL BULLETIN BOARD NUMBERS

<u>TITLE</u>	<u>PHONE NUMBER</u>
PUGET SOUND 99ERS BBS-SEATTLE	784-4142
TIBBS NW-ED DURFFFEED-BELLEVUE	641-5884
ABERDEEN	533-0951
TELETRAVEL	742-9034
SHUTTLE	885-INFO
TROTHGUARD-BURIEN	824-6757
KJR BBS	878-0158
GEnie	1-800-638-8369

MARCH MINUTES

By George Sjaastad

The meeting opened with introduction of officers and new members. There was no old business. Introduction of dealers produced a talk by Barbara Wiederhold of Queen Anne Computer Shoppe about the up and coming TI convention this September.

There was reports by the FORTH and ASSEMBLER interest groups which are not doing too good for attendance at this time.

A new program from Italy was introduced called BA Writer which is a word processor with enhancements to make it better than TI Writer. This is available from the club library.

The tape of the LA Fair was run showing new products from Millers Graphics and Myarc. Also the Diskazine (magazine on disk) was introduced by B. A. Traver.

It was brought up that RYTE Data Corp. of Canada will allow clubs to demo their products for free for 30 days if we send them a letter. They have a Gram-Karte card which goes in the box for module storage and RAM disk etc.

Chuck mentioned we are running the Pinewood Derby for the Cub Scouts with the TI computer.

The meeting adjourned at 9:30 pm.

THE PRESIDENT SAYS

By Chuck Wynne

First I would like to express a formal apology to Rita Glickman and Al Lawrence. You see, they didn't get a free trip down to LA. Some of the information I received was not true. Next time I will verify the facts first.

The tape of the LA Fair is all edited now. Any user group out there, or individual can purchase it for \$15.00 plus \$5.00 handling which includes postage. It turned out much better than Chicago's. We have personal speeches by Lou Phillips, Barry Traver, and William Warren (PR-BASE). It also has a lecture by Craig Miller of Miller's Graphics on the new IBM keyboard interface card.

We have two TI systems running at our house. One is a Myarc, the other Corcomp. This will provide a good review of both for those who are interested. As yet, I refuse to say which is best. Both have their pros and cons and I wish no misjudgement.

It looks^a as if the Home Computer Magazine is defunct. They transferred their membership over to another publication to finish the subscription period. They will no longer be in the publishing business. What a shame. I even liked

their ads when they ran them. It just makes our world of computing a little smaller.

TI exchange centers will no longer repair your computer equipment. You will have to send it to Texas, at your expense. Some of the dealers will help you do this. Otherwise, you will have to rely on local people to repair them.

Our computer smoked a power supply. This in turn burnt out the transformer. The transformer was then cracked open by us. It is glued at the base so you will have to hold the base in a vice and pull on the case. The thing that burnt out inside was not a transformer, but a little coil which seems to be a surge protector. Just tying the wires together made the thing work again. I do recommend you put a fuse inside for protection. The power supply in the TI console was easily replaceable for \$10.00 from our local dealers.

We piggy backed 4 Hitachi HM6264LP chips and wired them into one of our consoles in back of the game port. This provides us with a 32K console and reacts no different than the TI 32K. It has the advantage of not being beyond the connectors to the box. The option is not for everyone though. It was tough to put in. If you wish to try, I will send you the plans for 50 cents. Just call or write.

Tom, my son spent some time transferring text files from the TI to a Macintosh computer using Mass Transfer and a cable between RS232's. It worked like a champ with the TI RS232, however, the CORCOMP RS232 did not. We're still checking on what the difference is. They are definitely not exactly the same. If you wish to transfer files between two computers, Tom can help you out for a small fee.

FINANCIAL REPORT-1ST QUARTER

By Dennis Wood, Treasurer

Beginning Balance	Jan 1, 1986	\$422.17
-------------------	-------------	----------

Income

Dues	\$310.00
Library	229.00
Misc.	53.00

\$592.00

Expenses

Newsletter	\$236.83
Misc.	5.00

\$241.83

Ending Balance March 31, 1986 \$722.34

Note: Expenses were also incurred during the quarter for Disks, PO Box rent, and the Bulletin Board phone line, but I have not received invoices from the respective parties involved.

The clubs expenses for newsletter, PO Box and BBS run about \$100 per month. This means we need dues income from 120 active members or we need to supplement income through library sales. Encourage your friends to join.

Respectively submitted, Dennis Wood, Treasurer.

NEWSLETTER INFORMATION

By Gene Christiansen

Two months ago we announced a couple of contests that the readership could take part in. These were a "Name the Newsletter" contest and a competition for the best original program. I would like to take a little space to detail what we are seeking and the time factors involved. First of all, though submissions are coming in, we could use MORE! The deadline for the "Name the Newsletter" contest is the May meeting so have your entries ready by then. They will be judged by private ballot at this gathering with the winner being incorporated in the June newsletter. Please include any graphics with your new name, if desired. Secondly, for the original program we are not looking for something that will set the computer world on fire. Rather, we seek examples of how our readership is using the TI 99/4A. This could be a business, education, or entertainment application. As usual, all programs of merit will printed in the these pages. The deadline for this contest is Aug. 7th with the winner announced in the September newsletter. Let's get those entries in!!!

If you have any submissions to the newsletter, contest entries, renewals, new memberships, or much needed letters and questions, please send them to:

PUGET SOUND 99ERS USERS GROUP
POST OFFICE BOX 6073
LYNNWOOD, WASHINGTON 98036

REMEMBER TO GET YOUR NEWSLETTER SUBMISSIONS IN BY MAY 7!

BITS AND PIECES

By Gene Christiansen

Some interesting things have come about. It has been CONFIRMED that Craig and Sue Miller will be at the TI 99/4A

Convention here in Seattle this September. They are added to C. Regena and Lou Phillips, also confirmed to attend. C. Regena will also be a featured speaker at the Friday night dinner (Sept. 25th). She has further stated that she will "talk up" our happening in future issues of COMPUTE!

Ballard has upped the price of their Toshiba drives (mentioned here 2/86) to \$79.00 --- still a good buy.

Some other interesting additions for the TI are: a mouse, an IBM keyboard interface, support for an RGB monitor, and a home sentry system. Information on all of these can be obtained at both of the local dealers --- Bits and Chips (775-7390) and the Queen Anne Computer Shoppe (283-0953). Stop in and see all that is new for your system soon!!!

Dennis Wood has submitted an enhanced version of printer Control Codes to our library. The library also now has Funnel Writer (a TI-Writer enhancement from Australia) and the COMPLETE "C" Compiler (from Canada). See John Ueland at the next meeting.

Phil Bogle has a new FORTH utility to capture graphics off boards that are not TI. These remarkable programs allow us 99/4A users to see and use those great IBM, Apple, Commodore, etc. screens that were before unavailable. Chris George will demo this package at the Kirkland meeting.

Speaking of the Kirkland meeting, let us all plan to be there so that everyone has a say in the decision concerning the future use of this new facility by our group.

QUEEN OF THE HILL

By Gene Christiansen

You drive up a very long hill, find a parking place, and then climb the stairs of 6 1/2 Boston - the door next to the pet store. At the top of these creaking steps all is silent as you search around and then find the door with the marking of "Queen Anne Computer Shoppe". As you draw near this portal, a gentle murmur can be heard. Then you open the door! A cacaphony of sound engulfs you upon entering the busy room. On the phone, Barbara Wiederhold is trying to help someone set up his printer and Phil Jordan is telling a new, young TI owner of the secrets of using a data base, while installing disk drives in a third customer's PEB. Seeing that these two are both occupied, you turn to a waiting customer and ask if he was at the last user group meeting.

It is just another day on the top of Queen Anne Hill and another day for Barb and Phil at one of the most complete TI 99/4A dealerships in the country.

The completeness of this oasis is in the service, as

well as the amount of products available. I can not remember a time when I visited Barb and Phil but learned nothing. Nor did I get my question answered. Sometimes their help can only point me in a particular direction, but that alone can be invaluable! I have been to other shops that I found interested in just selling their wares. It is a joy to go to a Shoppe that is concerned that the user is getting the help and advice that he/she needs to make the most of the TI. (There are other shops that also care and I will cover them in subsequent articles.)

I find not only the latest in software and hardware, but a willingness to demonstrate, explain, and teach at the Queen Anne Computer Shoppe. Phil Jordan has answered some really sticky hardware questions, as well.

Barbara Wiederhold has been a major suport of the TI 99/4A in other ways. She has used the weight of her "Dealer's Name" to bring about the upcoming TI Fair planned for this fall. Her efforts have brought about the appearance the various people scheduled (see Bits and Pieces,Ed.). I mention this because Barbara is, as I say, using her "muscle" as a dealer in this area to make these things happen.

The Queen Anne Computer Shoppe is also setting up an after-hours BBS that can be used by calling her usual business phone (283-0953) when the Shoppe is closed.

It is hard to imagine a locality where it is difficult (if not impossible) to get help or buy the newest releases. I recently spent a week in Edmonton, Alberta. This is a metropolis of some 600,000 souls and not even one outlet for TI 99/4A related items!!! I did hear of a user's group but was unable to make contact.)

We often take for granted our good fortune of having an outlet like the Queen Anne Computer Shoppe available. I hope we will not be like the song that says "You don't know what you got 'til it's gone"!!!! SUPPORT OUR DEALERS!!!

PROGRAMMING TECHNIQUES: MODULAR PROGRAMMING

By Tom Wynne

I have been programming on my computer for 6 years and I have experience in many different programming languages. I have used many techniques in trying to solve a problem. From flowcharting to pseudocode to spaghetti code. All of them will work, but some are much more time consuming and some are hard to interpret and understand. After all of that, I have found one way of programming that is efficient and easy to read. It is called modular programming. This programming method is greatly encouraged by schools and programmers. 'Modular' means divided into modules or

subroutines. This type of programming can be used in almost any computer language, in fact, the TI uses this method in their GPL (Graphics Programming Language). The GPL has subroutines built in that clear the screen, read the keyboard, do mathematics, and many other things. The efficiency of this method of programming is that instead of working on a program as a whole, you can program each small piece separately. Another advantage is that after a program is complete, it will be very easy to read and understand. Another advantage to this programming is that if you create a subroutine for a program, you can save it and not only use it for your particular program, but use it for any other program that may need the same function.

The object of modular programming is to make your main program as small as possible and keep all of the details in the subroutines. The following program is an incomplete data base in Extended BASIC. The subroutines can be created later to fit your needs.

```
100 REM DATA BASE (INCOMPLETE)
110 ON WARNING NEXT
120 CALL MENU(CH)
130 ON CH GOTO 140,150,160,170,180,190
140 CALL LOADFILE :: GOTO 120
150 CALL SAVEFILE :: GOTO 120
160 CALL PRINTRECS :: GOTO 120
170 CALL ADDRCS :: GOTO 120
180 CALL FINDRECS :: GOTO 120
190 CALL QUIT :: GOTO 120
```

Notice that the main program is only 10 lines long. (lines 100-190) All of the details about the program are put off in subroutines (below). This makes the main program very readable. This program will first display the menu and get the response with CALL MENU(CH). CH is the variable the response is returned in. Line 130 will jump to the corresponding line number to CH. If CH is 1, then line 140 will be executed, or if CH is 4, line 170 will be executed, and so on. From there a subroutine is executed. When the subroutine is finished (SUBEND, SUBEXIT) it will return to the main program, like a GOSUB statement, and execute the next statement (GOTO 120) and display the menu again.

You can add the subroutines to do the special things you want to do. When you make a subroutine, you must specify the variable in the subprogram call and the subprogram like: CALL MENU(CH) and: SUB MENU(CH) If the CH is not specified, line 130 will not work. For more information, see page 180 in your Extended BASIC manual.

```
200 SUB MENU(CH)
210 DISPLAY AT(1,9)ERASE ALL:"MAIN MENU"
220 DISPLAY AT(3,3): "1. LOAD FILE"
230 DISPLAY AT(5,3): "2. SAVE FILE"
240 DISPLAY AT(7,3): "3. PRINT RECORDS"
250 DISPLAY AT(9,3): "4. ADD RECORDS"
260 DISPLAY AT(13,3):"5. SEARCH/UPDATE"
270 DISPLAY AT(15,3):"6. END SESSION"
280 DISPLAY AT(20,3):"CHOICE? (1-6)"
290 ACCEPT AT(20,17)SIZE(1)VALIDATE("123456"):CH
300 SUBEND
400 SUB LOADFILE
490 SUBEND
500 SUB SAVEFILE
590 SUBEND
600 SUB PRINTRECS
690 SUBEND
700 SUB ADDRCS
790 SUBEND
800 SUB FINDRECS
890 SUBEND
900 SUB QUIT
910 DISPLAY AT(24,1):"ARE YOU SURE? (Y/N)"
920 ACCEPT AT(24,28)SIZE(1)VALIDATE("YN"):YN$
930 IF YN$="Y" THEN CALL CLEAR::STOP
940 IF YN$="" THEN 910
950 SUBEND
```

FUNCTION "UP"

By Doug Rose

Two months ago, I typed in a article written by J. Peter Hoddie of the Boston Computer Society telling us some of the new features of the new Xbasic for our machine. I was very interested and excited about the enhancements. But while reading the article, one thing caught my attention. This was the inability to exit an Input or Accept At statement with anything but the enter key using Extended BASIC. Although not in any documentation, you can. The Function "UP" or "Down" arrow keys will exit you. This may seem like an overlooked option with no practical application, but this is not the case.

How often have you been running a program requiring a number of inputs, but instead of displaying a screen full of data with numerous Input or Accept At statements, the programmer uses the Input and Print commands. This type of data entry requires scrolling of the screen after every Input statement. I do not like this method for two reasons. First, I like to have as many questions the programmer might

ask as possible on one complete full screen and then go to the next. With the "scrolling of the screen" method, I catch myself impatiently wondering when the last input statement is coming.

Secondly, the computer is making me do all the work. I want to correct any errors in my typing, but by not retyping the line. With the "scrolling" method, once ENTER is pushed, if I want to correct the mistake, I have to retype all of the data at some latter time in the program. This takes time and seems unnecessary. Using the function up key, though, the correction is just a matter of looping back up to the preceding Accept At statement and then typing in the correct data.

Here's the way I do it. I display all the required data on the screen so the user knows what questions are going to be asked. Next, I use the Accept At key to input data, and, if desired, I have the input field already loaded with data from using the Display At command. Last, I use the Call Key command to branch to another line number if the Function "UP" arrow key was used instead of ENTER. With the program set up this way, I can now type in my data. If I make a mistake after pressing enter, I just hit the Function "UP" key and there I go up to the preceding line with my old data intact. Then I just type over the incorrect data and press ENTER to continue. You may need to refer to the Xbasic manual to see the many different options available to the programmer to help eliminate user errors.

Here is a sample program. If you would like this to be expanded, let me know. I'll add other features to make this a complete program with search, assembly sort, print, and disk routines.

```
100 CALL CLEAR
110 A=1
120 DISPLAY AT(2,1):"FULL NAME    ";NAME$(A)
130 DISPLAY AT(24,12):"PAGE # ";A
140 DISPLAY AT(4,1):"ADDRESS     ";ADDRESS$(A)
150 DISPLAY AT(6,1):"CITY       ";CITY$(A)
160 DISPLAY AT(8,1):"STATE      ";STATE$(A)
170 DISPLAY AT(10,1):"ZIP CODE   ";ZIP$(A)
180 DISPLAY AT(12,1):"TELEPHONE # ";TELE$(A)
190 DISPLAY AT(24,12):"PAGE # ";A
200 ACCEPT AT(2,12)SIZE(-16)BEEP:NAME$(A)
210 CALL KEY(0,K,S):: IF K=11 THEN 220 ELSE 230
220 A=A-1 :: IF A<1 THEN 110
230 ACCEPT AT(4,12)SIZE(-16):ADDRESS$(A)
240 CALL KEY(0,K,S):: IF K=11 THEN GOTO 200
250 ACCEPT AT(6,12)SIZE(-16):CITY$(A)
260 CALL KEY(0,K,S):: IF K=11 THEN GOTO 230
```

```
270 ACCEPT AT(8,12)SIZE(-16):STATE$(A)
280 CALL KEY(0,K,S):: IF K=11 THEN GOTO 250
290 ACCEPT AT(10,12)SIZE(-16)VALIDATE(DIGIT):ZIP$(A)
300 CALL KEY(0,K,S):: IF K=11 THEN GOTO 270
310 ACCEPT AT(12,12)SIZE(-16)VALIDATE(NUMERIC):TELE$(A)
320 CALL KEY(0,K,S):: IF K=11 THEN GOTO 290
330 A=A+1 :: IF NAME$(A)="" THEN GOTO 340 ELSE GOTO 120
340 DISPLAY AT(2,12):" "
350 DISPLAY AT(4,12):" "
360 DISPLAY AT(12,12):" "
370 GOTO 190
```

TI Writer: New character set with control U

By Dennis Wood

From the day I started using TI-Writer I longed for a better character set and an easier way of controlling my printer's special functions. The TI-Writer upgrade gave us lower case characters, but at the expense of smaller, harder to read characters. What was needed was lowercase, but as large as possible, consistent with the 6x8 pixel size available. With this in mind, I designed a new set of upper and lower case characters. In order to get descenders for the lowercase characters and still retain the uppercase size, I merely shifted the uppercase characters up one raster line. Since all 24 lines of text are all shifted up by the same amount, there is no difference on the screen. As TI-Writer loads the CHARA1 file the uppercase characters shift up one raster line. By doing this I could now define lowercase characters with a one line descender. The final result is uppercase characters defined in a 5x7 matrix and lowercase characters defined in a 5x5 matrix with an additional row below for descenders.

While doing this I had to learn how to read, decipher and change the CHARA1 file. As a result, I also discovered how the ASCII characters from 1 to 31 were defined. For example, the little cr at the end of each paragraph is represented by the ASCII 13 character. The other characters are shown on page 146 of the TI-Writer manual. After reading William Bullock's fine article in the September 1985 MICROpendium I realized how to get to the objective I sought. What was needed was a set of characters that would indicate what action was desired of the printer, and a Transliteration file that would take that character and transliterate it into the desired printer codes. I took the ASCII codes from 1 to 31 and defined a set of characters that would represent desired printer actions, such as Underline or Bold or Italic. To insert these characters in a document it is only necessary to type CTRL U followed by a

specific SHIFT or FCTN and a number or letter. When TI-Writer encounters this combination in a text file it sends that ASCII code to the printer. In order to get the printer to execute the desired function, it is necessary to transliterate that ASCII code into the sequence the particular brand of printer requires. There does not seem to be a standard set of codes, but most printers seem to be pretty close.

The following is a description of the special characters, the function they represent, what key to strike, and a transliteration file for a C. Itoh Prowriter Jr. Note: TI-Writer Transliteration software does not pass certain ASCII codes. These are:

These keystrokes are preceded by a CTRL U and followed by a CTRL U.

<u>FUNCTION</u>	<u>CHARACTER</u>	<u>KEYSTROKE</u>	<u>TRANSLITERATION</u>
NLO On	Large L	FCTN R	TL 27:27,120,1
NLO Off	Inverse L	Shift R	TL 18:27,120,0
Italic On	Large I	FCTN T	TL 29:27,52
Italic Off	Inverse I	Shift T	TL 20:27,53
Underline On	Large U	FCTN U	TL 31:27,45,1
Underline Off	Inverse U	Shift U	TL 21:27,45,0
Superscript On	Up Arrow	Shift E	TL 5:27,83,0
Subscript On	Down Arrow	Shift X	TL 24:27,83,1
Either Off	Inverse Arrow	Shift D	TL 4:27,84
Bcpi	Small 08	Shift Y	TL 25:(not Itoh)
Pica (10cpi)	Small 10	Shift A	TL 1:27,80
Elite (12cpi)	Small 12	Shift I	TL 9:27,77
Condensed On	Large C	Shift H	TL 8:15
Condensed Off	Inverse C	Shift K	TL 11:18
Expand On	Large X	Shift F	TL 6:27,87,1
Expand Off	Inverse X	Shift G	TL 7:27,87,2
Proportional On	Large P	Shift P	TL 16:27,112,1
Proportional Off	Inverse P	Shift O	TL 15:27,112,0
Bold On	Large B	Shift B	TL 2:27,71
Bold Off	Inverse B	Shift V	TL 22:27,72
Emphasized On	Large E	FCTN Z	TL 28:27,69
Emphasized Off	Inverse E	Shift Z	TL 26:27,70
Backspace	Back Arrow	Shift S	TL 19:8
8 lpi	Small L8	Shift 2	TL 0:27,48
7/72" line space	Small L9	Shift C	TL 3:27,49
6 lpi	Small L6	Shift Q	TL 17:27,50
4 lpi	Small L4	Shift W	TL 23:27,65,18
3 lpi	Small L3	Shift N	TL 14:27,65,24
Reserved characters are:			
Line Feed	Small LF	Shift J	TL 10:

New Page	Small PA	Shift L	TL 12:
Carriage Return	Small CR	Shift M	TL 13:
Cursor	Rectangle	Shift 6	TL 30:

A disk with the redefined upper and lowercase characters, and the above control characters as well instructions and examples for setting up an Include File (IF) for transliteration codes is available from the library or:

Dennis Wood
16709 SE 31st
Bellevue WA, 98008

Please send \$5 to cover the cost of the disk, duplicating, and mailing.

FUNLWRITER REVIEW

By Mike Allen

I recently recieved a copy of Funlwriter. With Funlwriter you can just about say goodbye to your TI-Writer, Editor/Assembler and Disk Manager modules. It runs in Extended Basic and comes with TI-WRITER, DPATCH (Disko), EDITOR ASSEMBLER and DM1000 v 2.3. It also has an option for Forth. I was at first amazed at the fact that I would no longer have to wear out my cartridge port by switching back and forth from E/A and TI Writer, but then I found out it could do alot more. First of all the TI-Writer and E/A versions that come with it have been modified so that the printer default can be changed in the load program so when you select the Print File option your printer configuration will be the entered automaticaly. Also, when you catalog a disk in TI Writer you can page through the files and if you press the equal key the directory will show what type of files are on the disk (ie; Basic or E/A). An asterix after the file length indicates a fractured file.

When you go from the editor to the formatter the filename that was used in the editor will be shown as the default filename. If no filename was used in the editor it will default to DSK2. DSK2 is the default used with Funlwriter's TI-Writer and Formatter, but that can be easily changed to DSK1 by paging through the Sectors on the disk using Disko. Every time you see DSK2 in the ASCII mode change it to DSK1.

You can even assemble E/A programs with Funlwriter, but the thing I like best about the program is that I can load and run E/A programs in XB. You can load "PROGRAM" formatted E/A programs as well as DISPLAY FIXED 80 files. I can update the bulletin file for the clubs BBS in TI-WRITER and then, without changing cartridges, load my terminal

program to send it to the board.

I think this is a great utility and a must for everyone's software library.

GRAM Kracker notes

By Tom Wynne

This month I will tell you about the utilities that come with the GRAM Kracker. I hope to see many more utilities come out for this powerful tool. If you wish to try to create or change programs in GROM, I highly recommend the TI99/4A Intern. It gives you a complete ROM and GROM disassembly of the TI and it also gives you some explanation of how GPL (Graphics Programming Language) works. This book is available from our local dealers.

The utilities on the GRAM Kracker diskette include:

1. Explorer option which enables the Millers Graphics Explorer program to talk to TRUE GRAM.
2. TI Writer GRAM disk which allows you to put both the editor and the formatter into GRAM memory at once. This makes it so if you chose the editor or the formatter off the menu, they load instantly from memory. It does not, however, load the CHARA1 file so it will not have true lower case. I have found, also, that the .IF (include file) function will not work. I do not know what the reason for this is.
3. Editor/Assembler GRAM disk which works in much the same way as the TI Writer GRAM disk in that it will load the Editor and the Assembler into GRAM memory and will execute immediately off the menu.
4. E/A-MOVER or TIW-MOVER. These utilities allow you to load both the Editor/Assembler and TI Writer into GRAM memory at once and will show both on the menu at once.
5. Extended BASIC calls (XBCALLS) will add new routines to Extended BASIC as follows:

CALL NEW -NEW your memory from a running program.

CALL BYE -Exit to the TI screen from a running program.

CALL CLSALL-close all open files. No file numbers.

CALL CLOCK -displays a clock in the corner of the screen.

CALL CLKOFF-turns off clock.

CALL CAT -Catalogs your diskette

(Note: these will only work with Extended BASIC version 110)

6. MSAVE and MSAVE6 allow you to write TI BASIC (not Extended BASIC) programs to the GRAM memory so they will be displayed on the TI menu. So you can make a TI BASIC

program and save it to the GRAM Kracker to work just like a separate module.

7. NEWCHARS and CHARA1 will install a new character set into GRAM 0 so your characters for TI BASIC, Extended BASIC, etc will be changed.

With these utilities you can do many things. With some of the utilities above, I loaded Editor/Assembler, TI-Writer along with the EDITA1 and FORMA1 files, and, a new character set all into the GRAM Kracker at once! It is quite a process, but here it is...

1. Save TI-Writer and Editor/Assembler modules to disk (Consult the GRAM Kracker manual if you need any help). I will refer to this disk as the MODULES disk.
2. Insert your MODULES disk in drive 1, choose '1 LOAD MODULE', and load your Editor/Assembler module off of disk.
3. Insert the GRAM Kracker disk in drive 1 and choose '1 LOAD MODULE' and type in the filename: DSK1.E/A-MOVER When it asks you for the GRAM chip, press '1' to move Editor/Assembler to GRAM chips 1 and 2
4. Insert your MODULES disk again in drive 1 and load your TI-Writer module off of disk.
5. Insert the GRAM Kracker disk in drive 1 and choose '1 LOAD MODULE'. Enter the file name: DSK1.TIWGRAMDSK Now insert your TI-Writer disk (with EDITA1 and FORMA1 files on it) in drive 1 and follow the instructions on the screen.

Now if you want the true lower case character set, do the following steps:

4. Choose '4 LOAD/SAVE CONSOLE' and then press '3. Grom/Gram 0', and then '2. Save Console' to save GROM 0. Now choose 4 again and press '3. Grom/Gram 0', and then '1. Load Console' to load GROM 0. Make sure that GRAM 0 switch is up, and that W/P switch is in the Bank 1 position. Now this puts the character set in GRAM so it can be changed.
5. Insert the GRAM Kracker disk in drive 1 and choose '1 LOAD MODULE'. Now type in the file name: DSK1.NEWCHARS and wait for it to load. Insert your TI-Writer disk in drive 1 (with the CHARA1 file on it) and choose 2 REGULAR CHARS for a new character set.

Now you have TI-Writer with the editor and formatter, Editor/Assembler, and a new character set loaded into the

