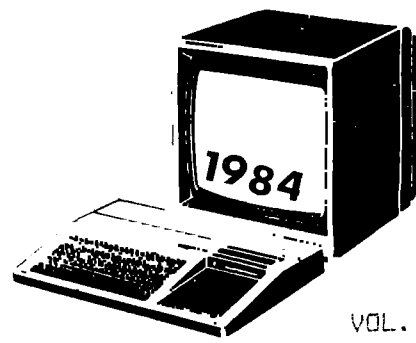


SGV 99/4 USERS' GROUP PRINTOUT

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EDITOR'S TWO BITS...

This month's issue is one of the biggest yet - sadly, most of the material was gleaned from other group's newsletters. Other groups have the same problem; most of the material comes from Washington D.C., Daytona, Pomona and Cin/Day Groups! I know we have talented people in The SGV group - let's see some sharing of info and techniques! Please don't worry about form or grammar. I'm not your eighth grade English teacher - I don't use a red pen! (It's blue.)

For those of you with children who work on your computer, have them send in their ideas and techniques. There's no gracing - just publication! Think of an article for the PRINTOUT as a summer project, when it's too hot to play outside.

As I was looking through the other newsletters, I noticed a number of new companies springing up across the country that are hoping to fill the gap left by TI. Most of them are specializing in software, a number are advertising adaptors so that you can use peripheral not necessarily meant for the TI. Time will tell if they CAN fill the gap. Corcomp is generating a lot of interest - we are lucky to have Craig Miller and Ron Wells so close by - we get first info and the chance to see the new products. The next few meetings should be exciting. I know Mike is planning to check out the expansion systems by CorComp: it is getting to the point that we want his and hers 99's.

Turning to financial matters, is it your time to renew your membership? If you don't feel that the club is offering what you want, it might be because we DON'T KNOW WHAT YOU WANT!! Use the Suggestion Box - Buttonhole an officer - Write Letters to the Editor - Get up & Voice your Opinions and Complaints at the Meetings! The surveys have helped, but not everyone filled one out. You may have a problem that no one else mentioned - so we'll never know if you don't tell us. The point of this diatribe is to remind you to look at your mailing label for the asterick. If it's there, it's time to renew.

See you at the June meeting!

Review: Assembly Language Books by Hector Santos

It is ironic that users of the TI-99/4A had to suffer a dearth of good books and software for their computer until Texas Instruments announced their withdrawal from the home computer market. These are now available like never before. Where we settled for less than the ideal, our problem, now, is in sifting through those that are available and selecting what we really need.

Such is the case with books relating to the TMS9900 Assembly Language. We used to have the Editor/Assembler Manual and the Software Development Handbook from Texas Instruments. We now have at least five other sources. We will cover three of them in this article and hope to cover the others in a subsequent article.

The three books are:

Introduction to Assembly Language for the TI Home Computer by Ralph Molesworth, Steve Davis Publishing
139 pages, softcover, \$16.95

Learning TI-99/4A Home Computer Assembly Language Programming by Ira McComic, Prentice-Hall
331 pages, softcover, \$16.95

Fundamentals of TI-99/4A Assembly Language by M. S. Morley, Tab Books
310 pages, softcover, \$11.50

Introduction to Assembly Language for the TI Home Computer, by Ralph Molesworth, was the first to come out. It attempts to teach assembly language by making comparisons to BASIC statements. Presumably, this helps you learn faster by letting you draw on your BASIC programming skill.

After an almost cursory explanation of assembly language, addressing formats, and the registers, you are thrown into programming. The instruction set is not covered separately, and detailed memory maps and appendices are not provided because the book was meant to be used with the Editor/Assembler Manual. At the end of the early chapters are references to pages in the Editor/Assembler Manual and words in the glossary that should be read. You learn assembly language by following the explanations provided in the illustrative programs. The programs cover Input/Output, file handling, and sorting and handling arrays. Of interest is Chapter 11, which discusses how to incorporate assembly language routines in your BASIC programs. The difference in coding for the Editor/Assembler and the Mini-Memory modules are clearly explained. Assembling and running programs using the two modules are also explained.

Unfortunately, the book was not provided with an index, a necessity in a book of this nature. Do not blame the author; it is usually the publisher's responsibility to provide an index.

As the title states, the book is an introduction. It should be enough to get you started in the right direction, but do not expect to learn advanced programming techniques like setting sprites in motion and checking for their coincidence.

The next book, Learning TI-99/4A Home Computer Assembly Language, by Ira McComic, is more formally organized. Although it has a tutorial quality in the way that you are guided through sample programs, its format is more like a college text. After a short introduction to assembly language, data structure, and the TI-99/4A architecture, an overview of the instruction set is presented with more detailed explanation later in the book. Two chapters are devoted to a discussion of the addressing formats with examples to illustrate how each is used. Chapters 9 and 10 cover the use of the Editor, the Assembler, the Loader, and the Debugger utilities of the package.

The book was written more for use with the Editor/Assembler. Of course, the principles you learn are just as valid for the Mini-Memory or the p-System Assembler-Linker. A very good description of how assembly language is handled by the Mini-Memory module is presented in Chapter 18 as well as a description of the capabilities of the p-System Assembler-Linker.

Illustrations and tables are used throughout the book, helping you visualize the storage and movement of data and the manipulation of bits in the registers. These make it a lot easier to learn the subject than with text-only material.

Appendices are also included. The most useful is the alphabetical list of instruction code. Designed for quick reference, detailed and concise information is provided for each instruction code I believe that after you learn assembly language, this is one book that you will keep referring back to.

In contrast, Fundamentals of the TI-99/4A Assembly Language, by M.S. Morley, was written specifically for use with the Mini-Memory module. The author had in mind users who want to learn assembly language but who do not own an expansion system. The Mini-Memory, in conjunction with the line-by-line assembler, enables you to get started with very little investment.

Morley starts out almost like McComic, covering assembly language, the TI-99/4A architecture, addressing modes, and the instruction set. Then, the use of the Mini-Memory is explained. You are shown how to enter the source code, and how to assemble and debug the program.

At this point, McComic and Morley diverge in their treatment of the subject. McComic comes back and discusses the instruction set in detail, and uses programs to illustrate the topics. Morley devotes the last two-thirds of his book to routines. These may be incorporated in your own programs and are very thoroughly explained. The appendix summarizes all the operation codes, grouped by categories. While not as complete as McComic's book, it still is very useful.

We have three books, each differing from the others in its approach to teaching assembly language. What about the Editor/Assembler Manual? I have heard a lot of people criticize the book, saying it is impossible to learn assembly language from it. The Manual is a reference book and was not meant to teach. It is a very good book; very thorough, very detailed in its coverage of the subject.

When we try to learn a new subject, we turn to tutorials for help. Once we learn it, tutorials become of less use and we turn to reference manuals for quick and concise information. I remember when I was trying to learn TI BASIC, I really liked Beginner's BASIC. Now I find the TI-99/4A User's Reference Guide more useful.

Assembly language is substantially more difficult than BASIC. I suspect that there can never be a book, tutorial or whatever, that will make it easy to learn.

PICNIC, PICNIC, WHEN'S THE PICNIC?

There has been some talk about the club getting together for a picnic in August. Some ideas that have been kicked around: Potluck (member's sign up to bring a favorite dish), the club provides the soda, computer swap table, games for prizes (the Coke bottle race is #1), baseball, volleyball, etc. Come to the June meeting for more details and to sign up for the Potluck and equipment lists. Could this be the first of an annual SSV 99'ers picnic tradition??

SIG GROUPS...

The surveys show that you have many interests. The general business meetings on Wednesday can't really cover all these interests every month. The answer: SIG (Special Interest Group). The Thursday meetings at the bank can be used for those who want to learn about Forth, Pascal, assembly, and Extended Basic. Also, SIG's can be set up to help you get the most out of TI's and other's software, TI Writer, Multiplan, etc. SIG's have been set up in other groups for children, women, and the handicapped. Let's talk about it at the meeting, Wednesday, June 6, at the library.

HELPFUL HINTS...

If you write a program using joysticks but do not want to specify which, then this subroutine is what you need.

```
100 CALL KEY(1,K1,S)
110 CALL KEY(2,K2,S)
120 IF K1+K2<>17 THEN 100
130 JS=INT(K1/18+K2/9+1)
```

The computer will respond to the joystick on which you press the fire button. Then use CALL KEY(JS,K,S) whenever you want to input from the joystick.

If you have memory expansion and Extended Basic, this subroutine can end your program by returning to the title screen.

```
CALL INJT:CALL PEET(2,A,B):CALL LOAD(-31B04,A,B)
```

For those of you with disk drives, expanded memory and Extended Basic, here is a loader program. By saving this program on each disk under the filename "LOAD", you can list "program" type files and run them automatically when you turn up the system in Extended Basic. This version is a bare-bones program that will access up to 46 programs. If you are ambitious, you can add your own features. You could also add RUN "DSK1.LOAD" to your programs in place of the END statement to reload this menu program. If you only have one disk drive, make the following changes:

```
3 @=1 :: R=@ :: C=@ (delete the rest of the line)
4 C$="DSK1." :: (the rest of the line-so I'm a little lazy)
```

There are limitations. You must have the required equipment, and all BASIC programs must be Extended Basic compatible. Also, this program does not recognize very long programs that have been saved in file types other than "PROGRAM".

The second program is a short drawing program I've written in BASIC. It moves the cursor and draws by means of the #1 joystick while other commands are entered through the keyboard. The instructions are listed below:

C clears the screen

Z changes screen color

G gets the cursor color

B moves the cursor back to the palette

Q or FIRE draws the color

I saves the screen to disk

V loads a screen from disk

To get a color, you move the cursor to the right of a square with the color you want then enter either 6 or 7. There is no erase feature so you have to color over those squares you wish to erase.

Remember when entering these programs that my printer has a tendency to cut off the tails of commas, so don't confuse them for periods. If I've overlooked anything, be sure to bring it up at the meeting.

I almost forgot! If you don't have a disk drive, I've included a cassette routine for dumping from and saving to the screen. You have to delete lines 39-69 of the drawing program, make appropriate changes in line 11 and incorporate the cassette routines.

TI IS REALLY OUT OF HC BUSINESS--

Effective April 2, 1984 TI will no longer manufacture or sell products for the 99/4. Hardware and software may still be obtained from local retailers from existing inventories or by mail order from Triton Company which has bought the remaining TI inventory, excluding what TI keeps on-hand for repairs which TI will still continue doing. Triton Co. may be contacted at:

Triton
P.O.Box 8123
San Francisco, CA. 94128
Phone# 800-632-4777

TI can still be contacted by mail at:

Texas Instruments
TI 99/4 Home Computer
P.O.Box 53
Lubbock, Texas 79408

```

1 REM DRAW PROGRAM
2 @=1
3 DIM C$(24)
4 CALL CLEAR
5 FOR A=@ TO 16
6 CALL COLOR(A,A,A)
7 CALL HCHAR(A+3,2,A*8+24)
8 NEXT A
9 C=40
10 GOTO 26
11 CALL KEY(@,A,B)
12 IF (A<13)+(A>19) THEN 30
13 ON A-12 GOTO 54,22,14,25,17,20,41
14 CALL GCHAR(Y,X,@,Z)
15 CALL SCPEEN(Z/B-3)
16 GOTO 30
17 CALL GCHAR.Y.X.@,C)
18 CALL HCHAR.Y,X,C)
19 SETG 30
20 D=C
21 GOTO 30
22 FOR A=@ TO 24
23 CALL HCHAR(A,3,32,30)
24 NEXT A
25 CALL HCHAR(Y,X,D)
26 Y=12
27 X=3
28 CALL GCHAR(Y,X,D)
29 CALL HCHAR.Y,X,C)
30 CALL JCYET(@,A,B)
31 IF (A=0)$(B=0) THEN 11
32 IF (X+SGN(A)=2)+(X+SGN(A)=33)+(Y=@)$(SGN(B)=@)+(Y=24)$(SGN(B)=-@) THEN 39
33 CALL HCHAR(Y,X,D)
34 X=X+SGN(A)
35 Y=Y-SGN(B)
36 CALL GCHAR.Y,X,D)
37 CALL HCHAR.Y,X,C)
38 SETG 11
39 CALL SOUND(-110,-2,B)
40 SETG 11
41 FOR Z=@ TO 24
42 A$="X"
43 FOR B=2 TO 32
44 IF A=13 THEN 48
45 CALL GCHAR(Z,B,C)
46 A$=A$&CHR$(C)
47 GOTO 49
48 CALL HCHAR(Z,B,ASC(SEG$(C$(Z),B,@)))
49 NEXT B
50 IF A=13 THEN 52
51 C$(Z)=A$&"X"
52 NEXT Z
53 IF A=13 THEN 5
54 CALL CLEAR
55 FOR Z=@ TO 16
56 CALL COLOR(Z,2,4)
57 NEXT Z
58 PRINT "SET ALPHA-LOCK"
59 INPUT "FILENAME: ";A$
60 CALL CLEAR
61 OPEN #@:"DSK1."&A$
62 FOR Z=@ TO 24
63 IF A=13 THEN 66
64 PRINT #@:C$(Z)
65 SETG 67
66 INPUT #@:C$(Z)
67 NEXT Z
68 CLOSE #@
69 A=13
70 GOTO 41

```

```

1 CLEAR PROGRAM
2 DIM C$(46)
3 DIM B$(46)
4 @=1 :: R=@ :: C=@ :: DISPLAY AT(@,@)ERASE ALL:"DISK(1-3)? " :: ACCEPT AT(@,12)
5 SIZE(@)VALIDATE("123"):A$
6 C$="DSK"&A$&". " :: OPEN #@:C$.INPUT ,RELATIVE,INTERNAL :: INPUT #@:A$ :: CALL
CLEAR :: FOR A=@ TO 46
7 INPUT #@:A$,B :: IF LEN(A$)=0 THEN 9 ELSE IF (A$="LOAD")+ (B<>5) THEN 6
8 IF A=24 THEN R=@ :: C=15
8 DISPLAY AT(R,C):USING 2:A :: DISPLAY AT(R,C+3):A$ :: B$(A)=A$ :: R=R+@ :: NEXT
A
9 CLOSE #@ :: DISPLAY AT(24,@):"RUN? " :: ACCEPT AT(24,6)SIZE(2)VALIDATE(DIGIT):
C :: IF (C>A-@)+(C=0) THEN END
10 A$=C$&B$(C):: R=LEN(A$)
11 CALL INIT :: CALL PEEK(-31952,A,B):: CALL PEEK(A*256+B-65534,A,B):: A=A*256+B
-65534 :: B=LEN(A$)
12 CALL LOAD(A,B):: FOR C=@ TO B :: CALL LOAD(A+C,ASC(SEG$(A$,C,@))): NEXT C ::
CALL LGAD:A+C,0)
13 RUN "DSK1."

```

```

1 REM CASSETTE SCREEN DUMP
2 REM BY PHIL NEWTON
3 REM NORTHWEST OHIO 99ER NEWS
4 DIM A$(24)
5 FOR R=1 TO 24
6 FOR C=1 TO 32
7 CALL GCHAR(R,C,CH)
8 A$(R)=A$(R)&CHR$(CH)
9 NEXT C
10 NEXT R
11 CALL CLEAR
12 OPEN #1:"CS1".INTERNAL,FIXED 64,OUTPUT
13 FOR R=1 TO 24
14 PRINT "WRITING LINE":R
15 PRINT #1:A$(R)
16 NEXT R
17 CLOSE #1
18 END

```

```

1 REM CASSETTE TO SCREEN DUMP
2 REM BY PHIL NEWTON
3 DIM A$(24)
4 CALL CLEAR
5 OPEN #1:"CS1".INTERNAL,FIXED 64,INPUT
6 FOR R=1 TO 24
7 PRINT "READING LINE":R
8 INPUT #1:A$(R)
9 NEXT R
10 CALL CLEAR
11 FOR R=1 TO 24
12 FOR C=1 TO 32
13 CALL HCHAR(R,C,ASC(SEG$(A$(R),C,1)))
14 NEXT C
15 NEXT R
16 CLOSE #1
17 END

```

```

1 !CHRISTMAS TREE PROGRAM
2 CALL CLEAR :: CALL SCREEN(2):: A$="FFFFFFFFFFFFFF" :: CALL CHAR(72,A$&"01030
70F1F3F7FFF18183C3C7E7EFFF80C0E0F0F8FCFEFF")
3 @=1 :: CALL CHAR(88,A$):: CALL CHAR(80,A$):: CALL CHAR(81,"995A3CFFFF3C5A99")
4 CALL CHAR(40,"3C7EFFFFF7E3C"):: CALL CHARPAT(40,A$):: FOR A=@ TO 3 :: CALL
CHAR(40+B*A,A$):: NEXT A
5 FOR A=8 TO 24 :: B=2*A-32 :: CALL VCHAR(ABS(B)+2,A,74+SGN(B),2):: CALL VCHAR(A
BS(B)+4,A,72,16-ABS(B))
6 FOR C=@ TO 4 :: RANDOMIZE :: CALL VCHAR(ABS(B)+4+RND*(15-ABS(B)),A,32+C*B,ABS(
(A>B)*(A<24))): NEXT C :: NEXT A
7 CALL VCHAR(2,16,81):: CALL HCHAR(21,@,88,128):: CALL VCHAR(20,16,80,2)
8 CALL COLOR(2,9,4,3,6,4,4,16,4,5,12,4,6,4,2,7,12,2,8,16,16)
9 FOR A=@ TO 28 :: CALL SPRITE(#A,42,16,@,RND*255+@,10,0):: FOR B=@ TO 200 :: NE
XT B :: RANDOMIZE
10 CALL COLOR(2,4-5*(RND>.2),4,3,4-2*(RND>.2),4,4,4-12*(RND>.2),4,5,4-8*(RND>.2)
,4):: NEXT A :: GOTO 9

```

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PICKING UP THE SLACK--

Corcomp is coming out with a whole array of peripherals REAL SOON NOW. The three we have seen, courtesy of Craig Miller, are the 9900 MICRO-EXPANSION SYSTEM, the 9900 EXPANSION SYSTEM, and a DUAL SLIM-LINE DISK DRIVE POWER SUPPLY and ENCLOSURE. Your local distributor should have everything available as soon as Corcomp adds the last features to the 9900 DISK CONTROLLER. Unfortunately, the introduction of the 9900 COMPUTEP will be postponed until the early fourth quarter of 1984. Here are the descriptions:

9900 MICRO-EXPANSION SYSTEM

This unit is about the size of two speech synthesizers and connects to the console expansion port. It is available as a stand alone RS232 or with 32K RAM and DSDD Disk Controller either installed or added to the box later. The box has external indicator lights for power, RS232, 32K RAM, and the Disk Controller. The RS232 allows serial and parallel interfacing with Centronics connections. All you need to complete this compact system is one or more slim-line disk drives.

9900 EXPANSION SYSTEM

Imagine a box the size of two full height drives that looks like a component from a stereo system, that what the Expansion System looks like. The left half has room for two stacked half height drives or one full height. The right half has a power switch and a mylar touch panel with indicator lights to show status of Disk Controller, RS232, 32K RAM, and expansion slots. A small round flex cable connects the box to the console through an unintrusive, rear facing, L-shaped connector. The power supply is more than adequate to handle all possible configurations of the system, and there will be no noisy fans unless heat tests show there is a need for one, even then it will be a VERY MUCH quieter model than the ones from TI. The only thing this system will be missing are the mysterious cards that will fit into the expansion slots.

DUAL SLIM-LINE DISK DRIVES

Corcomp will also be coming out with a dual half height disk drive power supply and enclosure. This will be for those who wish to take full advantage of the capabilities of the Corcomp Disk Controller to run four drives. This box fits neatly atop the 9900 Expansion System (like a component stereo) and, with four double-sided double-density disk drives, allows an on-line storage capacity of 1.4Mb.

9900 DISK CONTROLLER

This will come as a card that can fit in the TI P-box or as part of Corcomp's expansion systems. It can access up to four DSDD drives or mixed combinations of drive types and can be addressed as "DSK" or lower case "dsk". Tests to date have shown that it will load files 2-4 times faster than the TI Disk Controller. A Disk Manager program comes (on diskette) with this Controller and has many new enhancements beyond the Disk Manager cartridge such as the ability to load and run assembly language programs (e.g. TI FORTH) without using the Editor/Assembler module. The Controller also adds new commands and statements to the computer: CALL PEEK, CALL POKE, CALL PEEKV, CALL POKEV, CALL *GF (which loads and runs the Disk Manager), CALL EXEC (which executes machine language code in ROM or RAM), and CALL MOVEM (which moves blocks of memory from VDP and CPU RAM and ROM). There are also provisions for setting head seek times allowing the use of available faster disk drives. With all these features it's no wonder that Corcomp's production schedule is a little late.

I am glad to see that third party manufacturers are not only producing equipment for the 99/4 but also that they are surpassing the capabilities of TI's products. We can only hope that Corcomp's peripherals will be available soon.

GETTING TO KNOW YOUR COMPUTER BETTER

Have you ever wondered how your computer stores your program in memory. I have been playing around with CALL PEEK and CALL LOAD commands available in Extended Basic, and though there is a lot that I haven't figured out, I've come across some interesting things that might help you in your explorations. In examining the keyboard it occurred to me that certain key combinations aren't defined, such as FCTN 0. So I used the following program to give me the ASCII value of key combinations that I entered.

```
100 CALL CLEAR
110 CALL KEY(0,K,S)
120 IF S=0 THEN 110
130 PRINT K;CHR$(K)
140 GOTO 110
```

I found that ASCII values matched the ones in the back of the quick reference cards but also that certain values were not on the chart and also did not print a character. I next tried to key these characters into programs but kept getting an error message of "UNDEFINED CHARACTER". However, when I put them in REM statements I started getting BASIC words. For example, CTRL U gave RANDMIZE. The ASCII character assignment, as much as I can figure it, is given on the accompanying table (F=function, C=control). Note that some of the characters look like jibberish (128,185,198).

When I made this chart I noticed that many characters were still not defined. Then, I thought that maybe programs were stored in memory in this manner, so I tried to write a short routine that would print the contents of memory to the printer:

```
100 CALL CLEAR :: CALL INIT :: A=-560 :: OPEN #1:"PI0"
110 CALL PEEK(A,B):: PRINT #1:B;
120 IF A-INT(A/16)*16=0 THEN PRINT #1:CHR$(10)
130 IF A=560 THEN CLOSE #1 :: STOP ELSE 110
```

With this routine, you could enter anything you wanted after LINE 130 as long as it was syntactically correct. The program itself prints one byte at a time beginning at memory location -560 up to 560. To use it, list the program with your additions after 130, then RUN the program. You should get about two to three pages of numbers, 16 numbers per double-spaced line. If you match the numbers with those on the chart, you should be able to figure where your program listing is. I haven't been able to decipher the meaning of a lot of the numbers, but there is a group of numbers right before the program listing which, I think, tells the computer the memory locations of each program line. Here's an example:

```
34 157 200 4 73 78 73 84 130 64 190 200 1 49 130 65
190 194 200 3 53 54 48 130 159 253 64 181 199 3 80 73 79 0
```

is equivalent to

```
CALL INIT :: @=1 :: A=-560 :: OPEN #@:"PI0"
```

Here's how it breaks down:

0 is a DELIMITER that tell the computer that this is the end of a line
 34 is a LITERAL that tells the computer that there are 34 numbers in this line including the 0 and the 34
 200 4 tells the computer that the next four numbers that follow are part of a string

```
157 200 4 73 78 73 84 130 64 190 200 1 49 130
CALL I N I T :: @ = 1 ::
```

```
65 190 194 200 3 53 54 48 130
A = - 5 6 0 ::
```

199 3 tells the computer that the next three numbers are part of a string inside of quotes
 159 253 64 181 199 3 80 73 79
 OPEN # @ : " P I 0

One other character that I should mention here is a line number reference(201 0):

```
134 201 0 100
GOTO 100
```

Here the 0 is used for something else than marking the end of a line.

128 C,	160 CLOSE	192 FJ >	224 MIN
129 CA ELSE	161 SUB	193 FK +	225 RPT\$
130 CB ::	162 DISPLAY	194 FL -	226
131 CC !	163 IMAGE	195 FM #	227
132 CD IF	164 ACCEPT	196 FN /	228
133 CE GO	165 EPROP	197 FB ^	229
134 CF GOTO	166 WARNING	198 FY	230
135 CG GOSUP	167 SUBEIT	199 * DELIMIT	231
136 CH RETURN	168 SUBEND	200 STRING DELIM	232 NUMERIC
137 CI DEF	169 FUN	201 LINE # REF.	233 DIGIT
138 CJ DIM	170 LINPUT	202 ECF	234 ALPHA
139 CK END	171	203 ABS	235 SIZE
140 CL FOR	172	204 ATN	236 ALL
141 CM LET	173	205 COS	237 JSINE
142 CN BREAK	174	206 EXP	238 BEEF
143 CO UNBREAK	175	207 INT	239 ERASE
144 CP TRACE	176 CO THEN	208 LGE	240 AT
145 CO UNTRACE	177 C1 TO	209 SEN	241 BASE
146 CR INPUT	178 C2 STEP	210 S/N	242
147 CS DATA	179 C3 ,	211 SQR	243 VARIABLE
148 CT RESTORE	180 C4 ;	212 TAN	244 RELATIVE
149 CU RANDOMIZE	181 C5 :	213 LEN	245 INTERNAL
150 CV NEXT	182 C6)	214 CHR\$	246 SEQUENTIAL
151 CW READ	183 C7 (215 RND	247 JSTRT
152 CX STOP	184 F, &	216 SEG\$	248 UPDATE
153 CY DELETE	185 F.	217 POS	249 APPEND
154 CZ REM	186 F/ OR	218 VAL	250 FIXED
155 C. ON	187 C/ AND	219 STR\$	251
156 C; PRINT	188 FO XOR	220 ASC	252 TAB
157 C= CALL	189 F; NOT	221 PI	253 #
158 CB OPTION	190 FB =	222 REC	254 VALIDATE
159 C9 OPEN	191 FH <	223 MAX	255

Here are some ideas to help you edit your programs.

NUM can be used to edit. You already know that NUM helps when you initially enter a program by taking care of entering the line numbers and spaces. Here are examples:

NUM 10,10 starts numbering lines at 10 and increments by 10 so you have 10,20,30,...

Let's say you already entered the program and want to add lines 11,12,13,... You would enter NUM 11,1.

Or say your program ends at line 100 and you want to edit lines 80 and 90 as well as add lines 110,120,... You would enter NUM 80,10.

To get out of NUM just hit FCTN 4(CLEAR).

You can use RES with NUM to set up the lines for easier editing. If your lines are numbered 10,11,13,14,17,18,21,... NUM 10,1 would let you edit each line, but when you come across a blank line, e.g. 12, and hit ENTER you leave the NUM mode. By entering RES 10,2 you can use NUM 10,2 to edit. If there were line numbers less than 10 they would not be affected by RES 10,2.

If you are in the middle of NUM mode and hit FCTN 3 (ERASE), you can save the line by FCTN 4(CLEAR) which takes you out of NUM mode or you can enter FCTN P() on the blank line then ENTER. Since the quote is unmatched you will get an error message and resume editing that line in the NUM mode.

In Extended Basic, REDO is very helpful. If you have many lines that are very similar, once you enter one line, hit RES0 and the line will be displayed for editing INCLUDING THE LINE NUMBER. By changing the line number and the other items that need changing you can save yourself a LOT of typing. REDO is not only applicable to program lines it also works for COMMANDS.

It is best to edit even BASIC programs in Extended Basic so you can use REDO as well as the other editing techniques. The editor in Extended Basic is also faster.

** PROGRAMMING TIPS **

DISK SPACE -

Have you ever tried to estimate how many records you could fit on the unused portion of your disks? Maybe you tried to calculate the number by multiplying the record size by the number of records, only to find out you were way off track. In order to calculate the number of records you can get on the disk, you must first understand how the disk stores the data in the first place. The disk controller determines how the data is arranged on the disk itself, so even though two computers have the same disk drive, you may not be able to read a disk on your computer that was written on another. The TI disk controller arranges the data into SECTORS of 256 bytes each. Each time the program reads or writes to the disk, a whole sector is actually read or written. The number of bytes which the disk controller uses at one time is called the BLOCKSIZE. On some computers, you can specify the blocksize of a file. On the TI 99/4 the blocksize is fixed at 256 bytes. Since TI Basic takes care of the files for you, you do not have to worry about any of this. If you want to calculate how many records you can get on the disk, you must first know a few things about the file. First, you must know if the file is FIXED or VARIABLE. You must also know what the record length is. Both of these specifications are used in the OPEN statement.

First we will discuss VARIABLE length records. Variable length record files can only be processed sequentially. Therefore when you write to the file, each record is written after the previous one. The disk controller will write the records to the 256 byte buffer space until it cannot fit the next record in the block. When this happens the block is written to the disk and the buffer cleared. The next record is then placed in the beginning of the block. Since you do not know what the length of each record is going to be, you take the average record length and divide it into 256 to give you the average number of records per sector. The available number of sectors on a disk is shown on the disk catalog using the disk manager.

For fixed length record files, a more accurate estimation can be made. You simply divide the record length into 256. Then multiply the integer part of your answer by the number of available sectors on the disk to get an estimate of the maximum file size. As you can see, some care should be taken in selecting a record size in order to get the most data on the disk. For example if you choose a record length of 150 bytes, only one record can fit on the block of 256 bytes, which wastes the remaining 106 bytes. But if you could use a record length of 120 bytes, then you could get two records per block and only waste 16 bytes!

MINUTES...

Wednesday, May 2
Lucy Lynch demonstrated the TI database software modules, Personal Record Keeping and Report Generator. She gave good marks to both, citing only speed as a drawback, when compared to other databases. We had a swap meet to trade & sell computer equipment and software. Mike Hatcher was (is) selling his entire system. Ron Wells brought in the new CorComp RS232 box (with space for other cards). The whole expansion system will be much smaller than TI's.

Thursday, May 10
Craig Miller brought in more CorComp equipment and explained the intricacies of its development. We had some game demos, and Tom ran a BASIC instruction class. (ed. This is the meeting you want to attend for one to one help-bring your computer for hands on experience.)

Executive Meeting, Wednesday, May 23
The officers in attendance: Tom, Bob, and Cheryl, plus Mike and Sherry. We discussed the feasibility of a club Bulletin Board. At this point in our finances, the costs are prohibitive. To set up would require a second phone line, 2 disk drives, and a smart modem. Monthly costs of running it would be too high for the club to handle. However, if anyone would like to set up a bulletin board (already having the hardware), see Sherry for the program to get it running. Other topics discussed were the surveys, the upcoming picnic the third week of August, probably the park at the corner of Walnut and Merced, Library demos by Mike and other demonstrations for future meetings, including a modem demo.

ANNOUNCEMENTS...

- 1) The July meeting will be on July 11, the 2nd Wednesday of the month at the West Covina Library. 6:30 pm
- 2) For those of you are bringing friends to the meetings for more than three months: Remember the club policy is 3 (three) "free" visits, then pay dues and become a member or stop coming. The club survives on the members' dues, and 3 visits should be enough to decide if it's worthwhile to join.
- 3) Flyers, announcements and selling of merchandise must have prior approval of the officers. Using the group for your personal gain and profit violates the spirit of the group. We do have 'sponsor' memberships for businesses.

(VP BYTES HAS BEEN BITTEN BY THE VACATION BUG - SEE YOU NEXT MONTH)

YOUR OFFICERS...

- President: Tom Padilla (818) 330-8240
- Vice President: Bob Roquemore (818) 918-2207
- Treasurer: Floyd Wilson
- Secretary: Cheryl Young (818) 913-1109
- Librarians: Sherry Padilla - Acquisitions (818) 330-8240
Mike Young - Copying orders (818) 913-1109

If you would like to help in running the club, see one of the above people. The Librarians need help in writing descriptions and debugging of programs. If you have a program from the Library that doesn't have a description, and you would like to write one, give it to Sherry. If you have a program that you have fixed a bug in, let Mike know. Every little bit helps Mike & Sherry a lot. Ron Butts: THANK YOU!

NEW BOOK SIGN UP--

"The TI-99/4A In Bits & Bytes"
By Remo A. Loreto & Assoc. \$8.99 + \$1.50 UPS
We haven't yet seen this book, but we have done business with the author before. See Sherry or Cheryl.

WELCOME TO THE NEW MEMBERS - APRIL & MAY

- | | |
|------------------|----------------|
| Wilfred Wright | Calvin Hopkins |
| Gregory Brown | Richard King |
| John Evans | Gerald Dakford |
| Benjamin Marquez | James Murta |
| Madison Caldwell | |

Here's to an informative year...

And thanks to these people for renewing:

- | | |
|---------------------|-----------------------|
| Ed Santagrossi | Bob & Donna Roquemore |
| Ron Bishop | Paul Schippnick |
| Steve Milton | Craig Miller |
| Mike & Cheryl Young | Tom & Sherry Padilla |

Let's see more names next month!!!

LOCAL DEALERS...

DEALERS IN THE SAN GABRIEL VALLEY AREA

- | | |
|--|--|
| Ronald E. Wells
5527 San Jose
Montclair, California
91763 | Tex-Comp
P.O. Box 33084
Granada Hills, California
91344 |
| VideoConcepts
5174 Montclair Plaza Ln.
Montclair, California
91763 | TNT Computer Products
15971 Royale Court
Fountain Valley, California
92708 |
| Weatherfords
1095 E. 3rd Street
Pomona, California
91768 | Todd's Sales
129 N. Citrus Ave.
Covina, California
91722 |
| Tams
14392 Garfield Avenue
Paramount, California
90723 | Western Properties
P.O. Box 9602
Marina Del Ray, California
90291 |
| Model Masters
22411 Mountain Laurel Way
Diamond Bar, California
91765 | Datasoft
9421 Minnetka Avenue
Chatsworth, California
91311 |
| Computer Talks
21500 E. Arrow Highway
Covina, California
91723 | The Bach Company
P.O. Box 51178
Palo Alto, California
94303 |
| Miller's Graphics
1475 W. Cypress Ave.
San Dimas, California
91773 | Galaxy
902 N. Mountain Ave.
Ontario, California
91764 |
| AMC Computers
416 E. San Bernardino Rd.
Covina, California
91723 | Personal Computer
Workshop, Inc.
918 N. Citrus Ave.
Covina, California
91722 |

If you know of any more, drop a card in the Suggestion Box at the meeting. If you have any opinions about these dealers, we'll print your review in the PRINTOUT.

MEMBERSHIP FEES:

Adult Individual: \$15/year
Junior Individual: \$10/year
Family: \$20/year
Sponsor: \$50/year
Non-participating: \$ 5/year

A junior is anyone under the age of 18; a non-participating member is someone out of the area who would like to receive the PRINTOUT. For renewing members, look for the asterisk by your name on the mailing label. Send your checks or money orders to:

SGV User's Group
1008 Dore Street
West Covina, California 91792

MEETING PLACES:

First wednesday of the month for the general meeting: W. Covina Library at 1601 W. Covina Parkway, off the 10 (San Bernardino Freeway) at 6:30 pm.

Second Thursday of the month for classes & library business: Pomona First Federal Savings & Loan at 18220 E. Colima Road; Rowland Heights (Take the Fullerton exit of the 60 freeway) 7:00 pm.

Third Wednesday of the month for the officers' meeting: usually at Cheryl & Mike Young's place, 2438 Nina Street #3, W. Covina. (Off Amar & Temple).

SGV 99/4 User's Group
1008 Dore Street
W. Covina, CA 91792

President:
Tom Padilla

Vice-President:
Bob Roquemore

Treasurer:
Floyd Wilson

Secretary & PRINTOUT Editor:
Cheryl Ahrens Young

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