

JULY 1984
Vol.2 No.7



THE
SPRITE

a monthly newsletter of
THE 9900 USER'S GROUP, INC.

A voluntary organization for the
sharing of knowledge and
resources of people having
interests in, or ownership of
9900 processor based Home
Computers.

THE SPRITE is published monthly by THE 9900 USER'S GROUP, INC. for the enjoyment and furthering the knowledge of it's members in the use of 9900 processor based Home Computers. Address all correspondence to the EDITOR, THE 9900 USER'S GROUP, INC. P.O. Box K, Moorestown, N.J. 08057.

Articles from other newsletters are welcome and will be included to broaden our readerships base of knowledge and experience level. All submissions will be noted and credit given to the author. Articles from this newsletter may be reprinted for use by other user groups so long as the user group in question is an existing viable entity for the benefit of those wishing computer literacy. User groups that exist without a membership at large will not be considered user groups per-se. All articles or letters sent to the Editor for publication are subject to the unrestricted right to edit and comment.

THE SPRITE is available by subscription for \$12.00 per year for 12 issues. Send all subscription payments and/or change of address to THE 9900 USER'S GROUP, INC., Subscription Service, P.O. Box K, Moorestown, N.J. 08057.

It will be the policy of THE 9900 USER'S GROUP, INC. not to pass, copy, or sell copyrighted text, cassettes, diskettes, or any other copyrighted medium thru The Group without the permission of the copyright owner either by written permission or through the Copyright Clearance Center, 21 Congress St., Salem, MA. 01970.

Membership in THE 9900 USER'S GROUP, INC. does not impart to the general member any corporate authority or status to act for the corporation. Membership in THE 9900 USER'S GROUP, INC. is for one year from the month membership is acquired. Present membership rates are: \$17/yr. as of January 1, 1984. Rates are subject to change without notice.

THE SPRITE is soliciting advertisers at the following rates:

FULL PAGE \$15.00 Note: All submitted
1/2 PAGE \$8.00 advertisements must
1/4 PAGE \$5.00 be printer ready.

We must receive all submissions by the 12th of each month for the next month's printing. Prepaid Orders Only!

THE GROUP OFFICERS and STAFF:

PRESIDENT - Michael J. Baker VICE-PRESIDENT - Larry Wittenberg
SECRETARY - Ray Osowski TREASURER - (vacant)
LIBRARIANS - Ray Osowski, cassette
 Mike Harte, diskette

THE SPRITE STAFF:

Editor-in-Chief - Michael J. Baker
Research Editor - Errol Lansberry

INTRODUCTION:

We're sort of light on paper this month. That is, a short newsletter. Summer is taking it's toll I guess. In the same light we've reduced Splinter Group meetings to once a month in the summer. Look elsewhere in this issue for contacts. We were supposed to but forgot to implement the 'walk in fee' this month. We will do it next month. One American dollar (\$1.00) for members and \$2.50 for non-members. A one time 'FREE' visit will be allowed to prospective members. If you've been to a meeting before or a couple of general meetings (tsk tsk) you do NOT qualify for the 'FREE' visit. This courtesy is for NEW prospective members only and should not be abused.

The demo for our next meeting will be a demo of our BBS and how it works. Since we don't have use of a telephone line we will be cheating and merely connecting two computers via the RS232 ports and just simulate modems...at 9600 Baud... heh.. heh.. heh. Not only will the BBS be demo'd but some transferring of PROGRAMS (NOT FILES!) while in BASIC and Extended BASIC will be demo'd. This is an interesting method to transfer any PROGRAM and have it wind up in the other computer ready to RUN, LIST, SAVE or whatever. What is done is to have the progrrm you wish to send loaded into the computer via OLD CSI or OLD DSKI.MYNAME etc. Call the receiving computer and establish a link via the modem/RS232. At the sending computer the following is typed: SAVE "RS232" and at the receiving computer the following is typed: OLD "RS232". Who types which one in first is of no concern. The RS232 will wait until correct protocol is achieved. At the center top of each computer screen a number will appear and will begin to decrement when a transfer is firmly established. When it counts down to zero the cursor will reappear. That's all there is to it.

Starting in September we will return (we hope) to MARLTON MIDDLE SCHOOL and could possibly acquire the library for two evenings a month. One for the general meeting and the other one (maybe two) will be for Splinter Groups. This will take the sting out of always having to figure out where the next Splinter Group meeting will be.

CORCOMP:

The word is that the long awaited disk controllers from CorComp are in the process of being shipped. I keep looking out my door for a package and.... Anticipation.... sigh. Last month we got really excited about the 'FREE' 32k card that showed up. Well, dreams only last so long. The receipt stated 'N/C' which lead us to beleive a lot of things. All wrong however. It was paid for by a member under the CorComp 'Demo Plan.' Oh well. Since I mentioned DSDD disk cotrollers look for an interesting article further on. Do read the disk

controller section of THINGS THAT COULD HAVE BEEN.....

ADVANCED EDITOR ASSEMBLER DEBUGGER:

The newest and certainly long awaited 'debugger' has arrived from Texas Instruments. This software comes all on one disk. For those who do not have a printer the instructions will be made available on hard copy if you wish for \$0.75. This information is also on the disk in the "HELP" file for those who have printers. It should be noted clearly that the bulk of this debugger should be familiar to anyone who has used the DEBUG resident with the present Editor/Assembler. The functions that have been added are: a Diss-assembler, dumping memory to a HARD COPY device, Single Step **without** special hardware, and run until VALUE = an entered number. For those of you who have purchased the 'special' hardware to do single stepping do not fret. Those who have not may wish they still did. The hardware sold can also contain up to 8k of RAM which is mapped for the Command Module port. In addition, there is a 'load interrupt' button that automatically returns you to DEBUG which is extremely helpfull if your program lock-up. So, if you have this device you can do things other folks cannot. By the way, for those who are wondering the device mentioned is sold by Specialty Services 511Martna, Euless, Texas 76035.

BULLETIN BOARD STATUS:

Slow... but sure. It has been down for a couple of days due to major changes and to get this newsletter out. It has gotten VERY large. About 90 sectors! That's a bunch. Right now I'm in the process of combining lines, etc. etc. to clear up some irritating LINPUT I/O errors that have been plaguing us. I've discovered that I/O buffers are not handled exactly as the book would lead you to beleive. (Of course!) I do wish to thank those who have called and been 'bounced' by the system, waiting for a reboot that resulted in a reboot ad infinitum. However, that is the only SURE fire way to 'clean' the program out. Larry our Vice-President has carted his system here so we could communicate across the room and check it out that way but we can't do that all the time. He is however there most of the time when I call him and we do on-the-air checks. Thanks for your time Larry. As for everyone else, please do not stop calling. If you have any problems I can be contacted at 435-6157. Again, thanks to those who keep calling. I have gleaned quite a bit of info from all the 'crashes.' Try to leave more messages of interest if you get there. See you all at 300 Baud Lane.

TI TALK: from the LA 99ers

Welcome to TI TALK. First of all, I want to correct something I said last time. I stated that once you started the listing of a program with the LIST "SPEECH" command, it couldn't be stopped and that this might be a problem if the program was a long one. After the article was printed, I tried something new. I had tried to press the function key and hold down the "four" key at the same time as is done when you wish to stop a program listing to the screen. This always works with relative ease with most computers, although, my first computer was kind of slow at this. I tried this with the speech listing also, but it never worked before. Now I find that it does. Here is the key. When you do this fctn four to a program listing to the screen, the respose is more or less instantaneous. The same thing will work for LIST: "SPEECH", but you have to hold it down until the program stops listing. This may take a line or two before the computer gets the message, but it works. I wish I had known this before. Now you do. This month I want to talk about using PRINT #1 statements in speech. See the previous article for how to set up the OPEN #1 file. When using regular print statements in basic, if you are using a variable such as A\$ in a speech program, the rules for print statements do not necessarily apply. try this short program:

```
10 OPEN #1:"SPEECH",OUTPUT
20 INPUT "WHAT IS YOUR NAME? ":A$
30 PRINT #1:"HELLO ";A$;" HOW ARE YOU?"
```

Try putting the name PAUL as the input. You will notice that the results are less than desirable. In a normal print statement, semicolons are used to tell the computer you want the input name on the same line as the rest of the text. If you use this with speech, the words come out funny, especially, the HELLO PAUL. This is because the speech synthesizer considers these two words to be one word. You can overcome this by using a colon between your HELLO and your PAUL. This will give the speech a pause and tell the synthesizer that these are two separate words. If you need a colon in a normal print to the screen print statement, it will print "hello" on one line, "Paul" on the next line, and "How are you?" on the third line. The idea is to use speech lines separate from your lines which print to the screen. This will be O.K. because if you remember, you sometimes have to misspell words to make them sound normal when using speech and this way, your friends won't think you are a lousy speller like me. This means that if you want lines displayed on the screen as well as spoken, you will have type them twice. By the way, you cannot only use a colon, but a comma will work just as well. Here is another trick. If you want pauses between words, you can place a period, comma, etc., between words to give a pause of varying lengths. See the Terminal Emulator manual for details of amounts of pause time. First type the word and a space followed by a period, followed by another space and then the next word. The more

periods, preceded and followed by spaces will give you a longer pause between words. If you are interested in these articles and they are helpful to you, please let me know. Until next time.....

QUICK SORT:

The month before last we printed a program called heap sort. As promised this month the fastest sort from the Belgian 99er Club "QUICKSORT".

```
10 REM QUICKSORT
20 DIM A(100),ST(100,2)
30 RANDOMIZE (2)
40 REM SET UP RANDOM ARRAY 50 FOR I=1 TO 100
50 A(I)=INT(RND*999)
70 NEXT I
80 PRINT "START"
90 REM START OF SORT
100 N=100
110 L=1
120 R=N
130 T=0
140 X=(INT((L+R)/2))
150 I=L
160 J=R
170 IF A(I)=X THEN 200
180 I=I+1
190 GOTO 170
200 IF A(J)=X THEN 230
210 J=J-1
220 GOTO 200
230 IF A(I) < A(J) THEN 270
240 IF I=J THEN 270
250 I=I+1
260 GOTO 230
270 IF I=J THEN 320
280 H=A(I)
290 A(I)=A(J)
300 A(J)=H
310 GOTO 170
320 I=I+1
330 J=J-1
340 IF I=R THEN 380
350 T=T+1
360 ST(T,0)=I
370 ST(T,1)=R
380 R=J
390 IF L<R THEN 140
400 IF T=0 THEN 450
410 L=ST(T,0)
420 R=ST(T,1)
430 T=T-1
440 GOTO 140
```

```
450 PRINT "END"  
460 FOR I=1 TO 100  
470 PRINT A(I)  
480 NEXT I  
490 END
```

SPLINTER GROUPS:

We presently have 3 Splinter Groups in session. A BASIC group, an Extended BASIC group and an Editor/Assembler group. The next meetings of all three groups will occur in the last half of August. (Summer Schedule, winter schedule is every 2 weeks) Members are allowed to bring a guest to a meeting with the approval of the group leader. This is to avoid 20 people showing up in a small living room or bringing their 5 children who are all most likely under 3yrs of age. Keep in mind that bringing a guest is a one time courtesy. Members do pay yearly dues which entitles them to reduced rates. Members pay only \$1 and non-guests \$2.50 per session.

The contact points for the various Splinter Groups is as follows:

BASIC -	John Bagocius	609-829-5137
Ext BASIC -	Ray Osowski	609-829-0661
Ed/Assembler -	Mike Baker	609-435-6157

THINGS THAT COULD HAVE BEEN.....

There are a lot of things that could have been. One of them was the 99/8 which I got to hold in my hot little hands the other day. Impressive. It functions with the upgraded TMS9995 processor. It contained an improved P-code plus Hex Buss capability. I also saw and massaged a 99/2 and a CC-40 portable. I was told that the rumor of thousands of 99/8 stored in a warehouse was strictly fiction. There were probably only about 300 and all in prototype frames. The next things I saw was the unreleased TI Double Sided Double Density Disk Controller card. Along with that was a TI EPROM card. My gosh! The plans they had for us! Then some marketing genius decided TI had had enough. Oh well.

Anyway, something interesting was discovered in that we could not load TI FORTH. The system kept locking up on us. We tried two known good diskettes and still no luck. Since we had no other cards to swap we can only guess that the problem lies in the DSDD Disk Controller card. Probably something to do with the DSR etc. So, as with the Advanced Ed/Ass Debugger maybe we can get TI to release the diagrams if nothing else on the DSDD controller and the EPROM burner. Good Luck!

SERIAL to PARALLEL CONVERTER:

On the following page is a nifty project for the experimenter. Have a lot of software that's configured for RS232 but you have a parallel printer? Well, this little gizmo will output on the serial port making the computer think its talking to the RS232 and then on this external circuit all the data is converted to parallel for the parallel printer requirements. This circuit produces a CENTRONICS compatible interface. Good Luck

MEETING DATES:

Tuesday, 24 July 1984 at 7PM
Tuesday, 28 August 1984 at 7PM

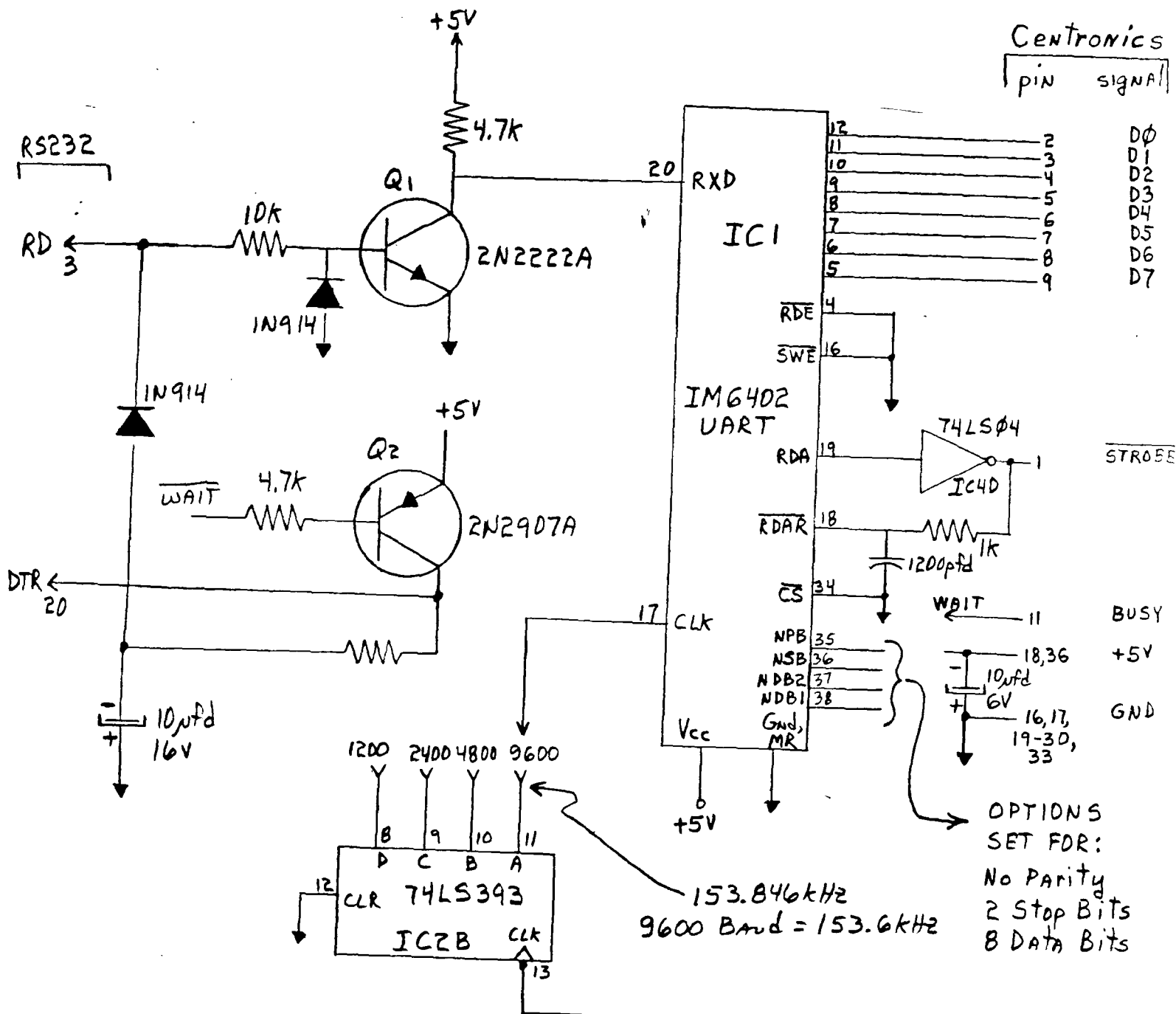
Meeting dates for the upcoming school year will probably be available for the next newsletter. We will be returning to MARLTON MIDDLE SCHOOL.

MEETING AGENDA:

7:00PM - 7:15PM	Welcome and Introduction
7:15PM - 7:45PM	BBS Demo
7:45PM - 8:10PM	Communicating without the TELL. 9600 Baud computer to computer communication.
8:10PM - 8:20PM	Door prizes PLUS!
8:20PM - 8:50PM	Open Session
8:50PM - 9:00PM	Last minute changes, info etc.

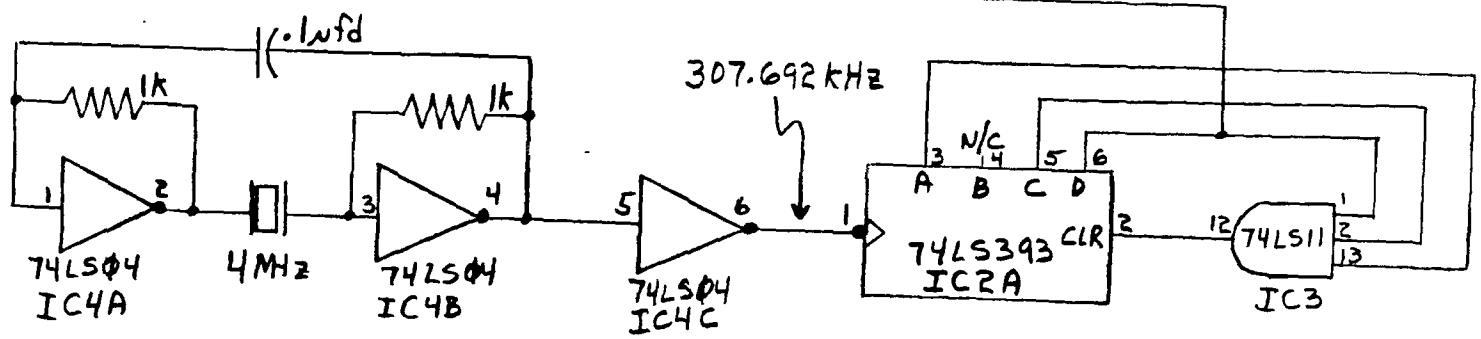
Centronics

pin	signal
2	D0
3	D1
4	D2
5	D3
6	D4
7	D5
8	D6
9	D7

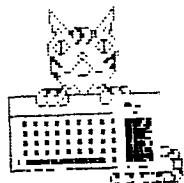


OPTIONS
 SET FOR:
 No Parity
 2 Stop Bits
 8 Data Bits

153.846kHz
 9600 Baud = 153.6kHz



TIGERCUB SOFTWARE
156 COLLINGWOOD AVE.
COLUMBUS, OHIO 43213



COPYRIGHT 1984 TIGERCUB SOFTWARE

THESE TIPS ARE DISTRIBUTED BY TIGERCUB SOFTWARE FOR PROMOTIONAL PURPOSES, AND MAY BE REPRODUCED BY NON-PROFIT ORGANIZATIONS PROVIDING THAT CREDIT IS GIVEN TO TIGERCUB SOFTWARE.

TIGERCUB SOFTWARE IS A KITCHEN-TABLE ENTERPRISE SPECIALIZING IN ORIGINAL LOW-COST QUALITY SOFTWARE FOR THE TI-99/4A COMPUTER. I HAVE OVER 130 PROGRAMS AVAILABLE ON CASSETTE OR DISK AT ONLY \$3.00 EACH. MY DESCRIPTIVE CATALOG WILL BE SENT TO YOU FOR \$1.00 WHICH IS DEDUCTABLE FROM YOUR FIRST ORDER.

LAST MONTH'S CHALLENGE WAS TO UNFURL THE U.S. FLAG (WITH 49 STARS), FROM THE MAST OUT, IN 2 LINES OF EXTENDED BASIC.

```
100 CALL CLEAR :: CALL COLOR
(2,16,5,3,16,16,4,7,7):: A$(
1)="*****080808" :: A$(2)=
RPT$("80",7):: CALL CHAR(33,
RPT$("01",8)):: CALL VCHAR(4
,4,33,20)
110 FOR C=5 TO 22 :: X=1+ABS
(C>11):: FOR T=1 TO 13 :: CA
LL VCHAR(5+T,C,ASC(SEG$(A$(X
),T,1))): NEXT T :: NEXT C
:: GOTO 110
```

ONE OF THE PREVIOUS CHALLENGES WAS TO WRITE THE EXTENDED BASIC STATEMENT IF X=1 THEN Y=7 ELSE IF X=2 THEN Y=33 ELSE IF X=3 THEN Y=19 ELSE IF X=4 THEN Y=21. MY SOLUTION WAS Y=VAL(SEG\$("07331921",X*2-1,2)). JIM JOHNSTON IN THE K*3 USER'S GROUP NEWSLETTER CAME UP WITH A METHOD WHICH IS BETTER BECAUSE IT DOES NOT REQUIRE THAT THE VALUES OF X BE IN A SEQUENCE:

```
Y=ABS((7*(X=1))+33*(X=2))+19*(X=3)
+(21*(X=4))
```

PROVING ONCE AGAIN THAT THERE IS MORE THAN ONE WAY TO SKIN THE CAT, AND OFTEN A BETTER WAY - ALTHOUGH THE CAT MIGHT NOT AGREE.

ADVICE TO DISK-DRIVERS - KEEP AN EYE ON THOSE LITTLE TABS OF SILVER TAPE THAT YOU USE TO COVER THE WRITE-PROTECT NOTCH ON YOUR DISKS. THEY TEND TO BECOME DOG-EARED FROM BUMPING AGAINST THE

SLOT OF THE DRIVE. I RECENTLY HEARD A HORROR STORY ABOUT ONE OF THOSE TABS THAT CAME LOOSE AND GOT INTO THE DRIVE!

THE FOLLOWING MENU-LOADER OR AUTO-BOOTER WAS ORIGINALLY PUBLISHED BY A. KLUDGE IN THE 99^{ER} VOL. 1 #4. MARSHAL GORDON AND THOMAS BOISSEAU GREATLY IMPROVED IT AND PUBLISHED IT IN THE ATLANTA 99/4 UG NEWSLETTER VOL. 2 #1. I HAVE NO IDEA HOW IT WORKS, BUT HAVE MANAGED TO MODIFY IT SO THAT IT WILL CATALOG UP TO 99 PROGRAMS ON A DISK, STOPPING FOR INPUT AFTER EACH 19 ARE LISTED, OR STOPPING WHENEVER ANY KEY IS PRESSED; I ALSO ADDED A DELETE OPTION, REQUIRING A REPEATED INPUT TO PREVENT ERROR. IT TAKES UP ONLY 8 SECTORS. IF YOU HAVE EXTENDED BASIC AND DISK DRIVE, LOAD THIS PROGRAM UNDER THE FILE NAME LOAD. IT WILL THEN AUTOMATICALLY RUN WHENEVER YOU SELECT EXTENDED BASIC, WILL LIST ALL THE PROGRAMS ON THE DISK, AND WILL RUN WHICHEVER PROGRAM YOU SELECT.

```
100 OPTION BASE 1 :: DIM PG$
(99),T$(5):: CALL CLEAR
110 T$(1)="DIS/FIX" :: T$(2)
="DIS/VAR" :: T$(3)="INT/FIX
" :: T$(4)="INT/VAR" :: T$(5)
)="PROGRAM"
120 IMAGE ##
130 DISPLAY AT(1,9)ERASE ALL
:"DISKETTE MENU"
140 I IF YOU HAVE MORE THAN
ONE DISK DRIVE, DELETE THE I
IN LINE 150
150 I DISPLAY AT(12,6):"DISK
?(1-3):" :: ACCEPT AT(12,19
)SIZE(-1)VALIDATE("123"):D$
:: D$="DSK"&D$&". "
160 D$="DSK1." :: OPEN #1:D$
,INPUT,RELATIVE,INTERNAL ::
INPUT #1:N$,A,J,K :: DISPLA
Y AT(1,1)ERASE ALL:SEG$(D$,1
,4)&" - DISKNAME="&N$;
170 DISPLAY AT(2,1):"AVAILAB
LE=";K;"USED=";J-K:"PROG FI
LENAME SIZE TYPE": "-----
" ::
I=0
180 FOR X=1 TO 80 :: IF X/20
<>INT(X/20)THEN 210
190 DISPLAY AT(24,1):"TYPE C
HOICE OR 99 FOR MORE" :: ACC
EPT AT(24,27)VALIDATE(DIGIT)
:K :: IF K=99 THEN 200 :: IF
K>0 AND K<X+1 THEN 360.ELSE
190
200 X=X+1 :: CALL VCHAR(1,2,
32,48)
```

(CONT.)

```

210 I=I+1 :: IF I>127 THEN K
=<X :: GOTO 300
220 INPUT #1:PG$,A,J,B
230 IF LEN(PG$)=0 THEN 270
240 DISPLAY AT(X+4,2):USING
120;X :: DISPLAY AT(X+4,6):P
$ :: PG$(X)=P$ :: DISPLAY AT
(X+4,18):USING 120;J :: DIS
PLAY AT(X+4,22):T$(ABS(A))
250 CALL KEY(0, KK, ST):: IF S
T=0 THEN 260 :: FLAG=1 :: GO
TO 280
260 NEXT X
270 DISPLAY AT(X+4,1):" " ::
DISPLAY AT(X+4,2):USING 120
;X :: DISPLAY AT(X+4,6):"TER
MINATE" :: DISPLAY AT(X+5,2)
:STR$(X+1)&" DELETE?"
280 DISPLAY AT(X+6,1):" C
HOICE"
290 ACCEPT AT(X+6,16)SIZE(2)
VALIDATE(DIGIT):K :: IF K<>X
AND K<>X+1 OR FLAG=1 THEN 3
50
300 IF K=X THEN CALL CLEAR :
: CLOSE #1 :: END
310 DISPLAY AT(X+5,11)SIZE(1
8):" #?" :: ACCEPT AT(X+5,15
)SIZE(2)VALIDATE(DIGIT):KD :
: IF KD<1 OR KD>X-1 THEN 310
320 DISPLAY AT(X+6,1)SIZE(28
)BEEP:"VERIFY - REPEAT DELET
E #?" :: ACCEPT AT(X+6,27)SIZ
E(2)VALIDATE(DIGIT):KD2 :: I
F KD2<>KD THEN 340
330 DELETE "DSK1."&PG$(KD)
340 CLOSE #1 :: GOTO 130
350 IF K<1 OR K>99 OR LEN(PG
$(K))=0 THEN 270
360 CLOSE #1
370 CALL INIT :: CALL PEEK(-
31952,A,B):: CALL PEEK(A*256
+B-65534,A,B):: C=A*256+B-65
534 :: A$=D$&PG$(K):: CALL L
OAD(C,LEN(A$))
380 FOR I=1 TO LEN(A$):: CAL
L LOAD(C+I,ASC(SEG$(A$,I,1))
):: NEXT I :: CALL LOAD(C+I,
0)
390 RUN "DSKX.1234567890"

```

COME TO THINK OF IT, IF YOU HAVE MORE THAN ONE DISK DRIVE YOU WILL ALSO HAVE TO DELETE THE FIRST STATEMENT IN LINE 160, AND MODIFY LINE 330.

HERE'S A MEMORY-SAVER FOR YOU - PUT YOUR DATA IN STRINGS INSTEAD OF DATA STATEMENTS. MY "HANGMAN PLUS" PROGRAM WAS ONLY 7764 BYTES LONG BUT IT CONTAINED A VOCABULARY OF 315 WORDS IN DATA STATEMENTS. AFTER

READING THESE INTO AN ARRAY, IT HAD TOO LITTLE WORKING MEMORY LEFT, AND PAUSED TOO OFTEN FOR GARBAGE COLLECTION. AFTER CHANGING ALL THE DATA STATEMENTS TO STRINGS, IT RUNS WITHOUT STALLING EVEN THOUGH THE NUMBER OF WORDS WAS INCREASED AND AN ARRAY OF 50 IS STILL DIMENSIONED FOR USER INPUT OF WORDS. WHEN I LOADED THE ORIGINAL VERSION IN EXTENDED BASIC WITH THE MEMORY EXPANSION AND ASKED FOR SIZE AFTER THE DATA HAD BEEN READ IN, I FOUND THAT I HAD 14756 BYTES OF PROGRAM AND 7669 BYTES OF STACK FREE. IN THE VERSION WITH DATA IN STRINGS, AT THE SAME STAGE IN THE PROGRAM I HAD 14874 BYTES OF PROGRAM AND 11310 BYTES OF STACK FREE - A SAVING OF 3730 BYTES! AND ANOTHER ADVANTAGE IS THAT THERE IS NO DELAY WAITING FOR ALL THOSE WORDS TO BE READ INTO THE ARRAY. HOWEVER, PULLING DATA OUT OF A STRING IS UNDOUBTEDLY A BIT SLOWER, SO THIS METHOD SHOULD NOT BE USED WHEN SPEED IS OF PRIMARY IMPORTANCE.

IN THE "HANGMAN PLUS" PROGRAM, I USED LOWER CASE LETTERS AS DIVIDERS BETWEEN THE UPPER CASE WORDS. TO PULL WORDS AT RANDOM, I RANDOMLY SELECTED A STRING AND A POSITION WITHIN THE STRING, USING THE POS OF THE LOWER CASE LETTER TO FIND THE WORD. THE FOLLOWING IS A MUCH ABBREVIATED EXAMPLE:

```

100 M$(1)="AJOHNBJOEGCHARLIE
DMIKEELARRYF"
110 M$(2)="AGEORGEBPETECHRI
SDONERALPHF"
120 X=INT(2*RND+1)
130 Y=INT(5*RND+97)
140 X$=SEG$(M$(X),POS(M$(X),
CHR$(Y),1)+1,POS(M$(X),CHR$(
Y+1),1)-POS(M$(X),CHR$(Y),1)
-1)

```

IT IS OF COURSE ESSENTIAL THAT ALL THE STRINGS CONTAIN THE SAME NUMBER OF ELEMENTS OF DATA. IF LOWER CASE LETTERS ARE NEEDED, THE SEPARATORS CAN BE ASCII CODES 129 THRU 154, OBTAINED BY HOLDING DOWN THE CTRL KEY WHILE TYPING THE ALPHABET - IT'S A BIT HARD TO KEEP TRACK OF THOSE, BECAUSE THEY'RE INVISIBLE! NUMERIC DATA CAN ALSO BE STORED, USING THE VAL FUNCTION TO CONVERT IT TO NUMERIC AFTER IT IS PULLED FROM THE STRING.

YOU PROBABLY ALREADY KNOW THIS, BUT YOU DON'T HAVE TO TYPE IN THE BLANK SPACES BEFORE AND AFTER THE :: IN MULTIPLE STATEMENTS IN EXTENDED BASIC. JUST RUN EVERYTHING TOGETHER 100 CALL CLEAR::RANDOMIZE::FOR D=1 TO 100::NEXT D AND THE COMPUTER WILL SEPARATE IT FOR YOU, SHOWING STATEMENTS INTO ADDITIONAL LINES IF NECESSARY.

OUT OF MEMORY

HAPPY HACKIN'

JIM PETERSON