NEWSLETTER OF THE DECATUR 99er USERS' GROUP

FRESIDENT'S NOTES...by L. R. Livergood took much longer. We'll have some information on one of these programs the next meeting. If you are one of the people who have seen PRINT Sun

Once again our mailbox has been stuffed full of interesting new software, hardware and programming items you should know about. For example, OSRAM INDUSTRIES is advertising their new RAMPORT MODULE which adds an additional 8K of RAM memory and offers a variety of other features.

the term FREEWARE mean anything to you? The latest issue of MICROpendium lists many of the excellent programs which will be sent to you for just postage and handling charges. If you decide you like the program then just send the programmer the amount requested or what ever you feel its worth. Most are asking for less than \$10.00 and many are worth much more than that. Here are some of the programs available:

SUPER DISK DUPLICATOR--Copies about anything and everything including only those sectors which you want.

TK WRITER--Loads TI-WRITER from Extended Basic or E/A module thus eliminating the need for the cartridge

ATLIST--Utility program which formats you program listing for easy reading. Includes variable references.

MASSCOPY--Copies disks in 3 passes or less.

X DISASM--An Extended Basic disassembler utility.

If you are interested in any one of these or others, please see me at the next meeting. If they fulfill a need then I suggest that you complete your end of the deal and send something to the programmer or else it may be the last you'll ee. It's up to us to make a program like this work and besides, where else can you get quality software at these prices?

While reading one of the other newsletters I noticed a plea on behalf of Jim Peterson (TIGERCUB SOFTWARE). This person suggested that his group send \$100 to Jim for his contribution to the cause. If you don't know who Jim is then you haven't been reading our newsletter because he is the author of all those clever programming tips which help to fill two of our pages each month.

We are publishing his 21st tip sheet and I believe he deserves something in return. Although our budget limits us from making such a contribution, I feel we should do something. Probably the best thing would be to buy his software on an individual basis. If you've typed in any of his tips then you know you can count on his other programs which are selling for \$3.00 th. His catalog is available for ordering.

Before I forget, elections are this month so please plan to attend. Don't worry about being conned into doing something you don't want to do because and so sold evid elike grieser product want to do because

the election committee has aready talked to everyone who is running. On the other hand, if you are interested, let us know because we can always us your help. Either way everyone should show up to see who the new officerare going to be and to enjoy another good meeting. Also, you might see some new faces.

those looking for a screen dump for Super Sketch, you may not have to For look much longer. We'll have some information on one of these programs at the next meeting. If you are one of the people who have seen PRINT SHOP on another computer and wish they made it for the TI then you may be interested in reading the evaluation on CHARACTER SETS AND GRAPHICS DESIGN in this month's issue of MICROpendium. It looks to be quite similar.

After reading it you may want to take down the address of the magazine subscribe because for \$15.00 per year it's well worth it. Advertising was way up this issue and there is talk of going to 48 pages in June.

There's much more to talk about but we have several programs to include this issue so, rather than use up program space, you'll have to come to the meeting to get the rest. See you there!

NEW FURCHASES...by C. S. Stringer

Club members who were not present at the last meeting may not know that we have the opportunity to buy cartridge software and a few items of hardware at reasonable prices directly from the TI Learning Center in Chicago.

Members who ordered items at the last meeting are assured that the items they wanted have been reserved and will be brought to the next club meeting.

I had hoped to go to Chicago about May 15 to pick up the things, but for personal reasons that didn't happen. I now plan to go about June 11.

If anyone is interested in placing an additional order, please call me 877-2780. All ofthe items on the original list are still available except for 'Terminal Emulator II'. Two items have been added ('Video Chess' 'Personal Record Keeping') at the same price as the others--\$5.30 each.

We had hoped that there would be some more hardware by this time, but that doesn't look very promising. There are plenty of speech synthesizers and a few stand-alone expansion memories. There may be a few disc drive controllers, but no disc drives.

LIBRARY CORNER...by Jay Seaberg

Program descriptions on everted I be deade git delS ein pridecloug ens

We have had many requests for short descriptions of programs available through the library. Beginning this month, every newsletter will contain a brief description of some of the programs we have in stock.

In addition, a complete list of all software is in the process of written that will also give brief descriptions of the program.

program aiding reading skills. Gives choice of alpha E002 READFASTA and/or numeric screens, length of text, and speed. Requires Extended Basic and tape or disk.

GO19 KRAZY KOALA Game program with good speed and graphics. Help the bear scue his friend stranded at the top while dodging birds and other dangers. Requires Extended Basic.

ETATIONUS PONANTA MIR

<u>GO30 SNAKES AND LADDERS</u> Game styled after Chutes and Ladders. Good graphics and neat little program. teaches counting skills and is fun to play. Console basic.

<u>UOO8 PROGRAM COMPACTOR</u> A program for compacting programs written in basic or Extended Basic. Removes REM statements and shortens variable names. Requires Extended Basic and disk system.

<u>DOO4 BEETHOVEN</u> A program that shows off the graphics and music capability of your computer. Plays Beethoven's Variation on a theme with a graphic piano with moving keys. Requires Extended Basic

---- ARTILLERY A take-off of the old standard computer game with grpahics. Input firing angle in degrees and destroy the enemy before his incoming shell gets you. Console basic.

ACKNOWLEDGMENTS

In the past, we have printed articles from other sources without giving proper recognition to the author. The reason for this was usually due to the end-of-the-month printing squeeze which left little time for cut and sting everything together.

We'd like to point out that it has never been our intention to deceive anyone by claiming them as ours. Sometimes we will print an article which has arrived by way of third or fourth generation, leaving no clue as to where it actually originated. Our apologies to those who may have picked up our newsletter and found their article without their name or their group name on it.

As a way of addressing this problem, we will try to indicate in this column who has contributed what in the form of outside articles. Please note that the group listed is only the one where the article appeared and is not necessarily the group with whom the author belongs. Hopefully this method will allow us to add to the list up to the time of printing the master.

TIPS FROM THE TIGERCUB Jim Peterson (TIGERCUB SOFTWARE)

SHORT BASIC PROGRAMS from the OZARK 99'ER NEWS (authors unknown)

FRACTION FOR DECIMAL PROGRAM from the CLEVELAND AREA 99/4 U.G. (author unknown)

RABIDby Cullhane Gibbs (LOS ANGELES 99'ERS)

CIRCLES from Jack Schreiber (ATLANTA 99/4A COMPUTER USERS GROUP)

SELECTION GUIDE from the ATLANTA 99/4A COMPUTER USERS GROUP

FORTY-COLUMN SCREEN BY ROY T. Tamashiro, ED.D (CIN-DAY USER GROUP)

RE-DEFINE CURSOR from OZARK 99'ER USERS GROUP (author unknown)

FILE PROCESSING R. K. Hallmark (HOOSIER USERS GROUP)

...anks to all the above for their contribution.

```
100 REM **COLOR BONANZA**
                                                        110 CALL CLEAR
120 FOR A=40 TD 136 STEP 8
130 CALL CHAR(A, "55AA55AA55AA55AA")
140 NEXT A
                          150 FOR B=2 TO 14

160 CALL COLOR(B,1,1)

170 CALL VCHAR(1,2*B,24+8*B,22)

180 CALL VCHAR(1,2*B+1,24+8*B,22)

290 NEXT B

200 FOR C=2 TO 14
                                                                                                               graphics and nest little program. teaches co
 210 CALL SCREEN(INT(16$RND)+1)
220 FOR D=2 TO 14
230 CALL COLOR(D,D,C)
240 NEXT D
250 CALL KEY(O,K,S)
260 IF S<1 THEN 250
270 NEXT C
280 GOTD 200
                                                                    CALL SCREEN(INT(16#RND)+1)
                                                        210
                                                        100 REM **HAPPY BIRTHDAY**
   110 CALL CLEAR
120 OPEN #1: "SPEECH", OUTPUT
130 FOR T=1 TO 51
                                                                                                           shell gets you. Console basic.
                                                                  PRINT #1:A$
                                                       150
                                                        160
                                                        170
                                                                   END
                                                      180 DATA //30, HAPPY, //28, BIRTH, //30, DAY, //23, TOO, //25, YOU, ,,
190 DATA //30, HAPPY, //28, BIRTH, //30, DAY, //21, TOO, //23, YOU, ,,
200 DATA //30, HAPPY, //13, BIRTH, //18, DAY, //23, HAPPY, //25,
BIRTH, //28, DAY, ,
210 DATA //17, HAPPY, //19, BIRTH, //23, DAY, //21, TOO, //23, YOU
                         100 DEM +44 EL MARE OF THE TOTAL OF THE TOTA
                                                       100 REM **A GLIMPSE OF REALITY FOR COMPUTER ADDICTS**
                                              120 CALL CLEAR
130 CALL CHAR(96, "1018183C3C7E3C18")
140 CALL CHAR(112, "FFFFFFFFFFFFFF")
150 CALL CHAR(120, "FFFFFFFFFFFFFF")
160 CALL CHAR(121, "555555555555555")
170 CALL CHAR(122, "5D5D5D5D5D5D5D5D5D")
180 CALL CHAR(128, "000011925438FF5D")
190 H=22
                                                      120 CALL CLEAR
130 CALL CHAR (9
                                                       190 H=22
                                         190 H=22
200 CALL COLOR(9,16,1)
210 CALL COLOR(11,2,2)
220 CALL COLOR(12,13,1)
230 CALL COLOR(13,14,1)
240 CALL VCHAR(4,16,112,3)
250 CALL HCHAR(4,17,112,3)
260 CALL VCHAR(4,20,112,18)
270 CALL HCHAR(22,1,120,96)
280 CALL HCHAR(3,18,112)
290 CALL HCHAR(2,17,112,3)
300 G=0
                                                      300 G=0
                                                    320 FOR Z=7 TO H-1
330 CALL VCHAR(Z, 16, 96)
340 CALL VCHAR(Z, 16, 32)
350 NEXT 7
                                                      350 NEXT Z
                                                     370 CALL SOUND(15, (H*150), 2)
380 CALL HCHAR(H, G, 121)
390 IF G=32 THEN 300
                                                                IF 6=32 THEN 300
IF H=7 THEN 410 ELSE 320
FOR F=3 TO 30 STEP 3
CALL HCHAR(7,F,128)
CALL VCHAR(8,F,122,14)
CALL SOUND(30,(F*200),2)
NEXT F
PRINT #NOW DO COMMENT
                                                     400
                                                      410
                                                      420
                                                      430
                                                      440
                                                      450
                                                                  PRINT "NOW DO SOMETHING ABOUT IT!!"
                                                                 GOTO 470
```

TIPS FROM THE TIGERCUB

022

Copyright 1985

TIGERCUB SOFTMARE
156 Collingwood Ave.
Columbus, OH 43213

Distributed by Tigercub Software to II-99/4A Users Groups for promotional purposes and in exchange for their newsletters. May be reprinted by non-profit users groups, with credit to Tigercub Software.

The entire contents of Tips from the Tigercub Nos. 1 through 14, with more added, are now available as a full disk of 50 programs, routines and files for just \$15.00 postpaid!

Nuts Bolts diskfull of 100 (that's right, 100!) IBasic utility subprograms in MERGE format, ready for you to serge into your own programs. Contents include 13 type fonts, 14 text display routines, 12 sorts and shuffles, 9 data saving and reading routines, 9 wipes, 8 pauses, 6 music, 2 protection, etc., and now also a tutorial on using subprograms, all for just \$19.95 postpaid!

And I have about 140 other absolutely original programs in Basic and XBasic at only \$3.00 each! (plus \$1.50 per order for casette, packing and postage, or \$3.00 for diskette, PPM) Some users groups charge their members that much for public domain programs! I will send you my descriptive catalog for a dollar, which you can then deduct from your first order.

This challenge was printed in Tips #21 -

100! The Unprintable Unkeyable Program!
110! To shuffle the numbers 1 to 255 into a random sequence without duplication
120! The strings contain the ASCII characters 1 to 127 and 128 to 255
130! Most of the ASCII characters below 32 or above 159 cannot be input from the keyboard
140! So how was this program programmed?
150 hs="

!""#\$Z&'()#+,-./0
1234567B9:;(=>?@ABCDEF5HIJKL
MNOP@RSTUYWXYZ[\1^_'abcdefgh
ijklonopgrstuywxyz{!}""
160 M2\$="

And here is the answer —
It was written by a program
that writes a program!
Key this in and run it to
create a MERGE format disk
file. Then type NEW, then
type MERGE DSK1.LONGSTRING
and you will have a RUNable
program consisting of lines
150-170 of the puzzle!

100 DPEN \$1: DSK1.LONGSTRING
", VARIABLE 163
110 LN=100 :: GOSUB 190 :: A
s=Ls&"Ms"&CHR\$(190)
120 FOR J=1 TO 127 :: C\$=C\$&
CHR\$(J):: NEXT J :: A\$=A\$&CH
R\$(199)&CHR\$(127)&C\$&CHR\$(0)
130 PRINT \$1:A\$
140 GOSUB 190 :: B\$=L\$&"#2\$"
&CHR\$(190)
150 FOR J=128 TO 255 :: D\$=D
\$&CHR\$(J):: NEXT J :: B\$=B\$&
CHR\$(199)&CHR\$(128)&D\$&CHR\$(0)
160 PRINT \$1:B\$

170 GOSUB 190 :: F5=L54"M5"&

CHR\$ (198) & "M\$ "&CHR\$ (184) & "H2

**&CHR*(0)

180 PRINT 01:F6 :: PRINT 01:
CHR*(255)&CHR*(255):: CLOSE
01 :: END
190 L*=CHR*(INT(LN/256))&CHR
\$(LN-256*INT(LN/256)):: LN=L
N+10 :: RETURN

Now type 10 remaining lines, and you will have a speeded-up version of the Tigercub Scramble which was published in Tips #10. It is still not as fast as the CALL PEEK versions but is such sore useful because you can andify it to scramble a sequence of any length anywhere between 1 and 255. For example, to shuffle the numbers 100 to 150 into a random sequence without duplication, just add a line 175 MS=SE6\$ (MS, 100,50).

The method of writing a "program that writes a program" was fully explained by John Clulow in the 99er magazine Vol. 1 Nos. 3 and 4. It is a little-used but very valuable technique.

For instance, Tips#9 contained the following routine to turn the alphabet upside-down.

100 FOR CH=33 TO 127 :: CALL CHARPAT(CH,CH\$):: FOR J=1 TO 16 STEP 2 :: X\$=\$E6\$(CH\$,J,2)&X\$:: NEXT J :: CALL CHAR(CH,X\$):: X\$="" :: NEXT CH 110 INPUT A\$:: 60TO 110

The only trouble with that is that it takes about 50 seconds to run. Try this instead -

100 FOR CH=33 TO 127 :: CALL CHARPAT(CH, CH4):: FOR J=1 TO 16 STEP 2 :: X\$=SE6\$(CH\$, J, 2) & X\$:: NEXT J :: CALL MRITE(CH, X\$):: X\$="" :: NEXT CH 1000 SUB MRITE(CH, X\$):: IF FLAG=1 THEN 1010 :: FLAG=1 :: OPEN 01: DSK1.MRITE*, OUTPUT, DISPLAY, VARIABLE 163 :: LN =3000 :: 60SUB 3000 1010 I=X+1 :: L\$=L\$&CH\$\$(200

)&CHR\$(16)&I\$:: IF I(5 AMB CH(127 THEN LS=LS&CHR\$(179): : SUBEXIT

1020 I=0 :: PRINT 01:LS&CHRS
(0):: LS="" :: IF CH=127 THE
N 1030 :: 60SUB 3000 :: SUBE
NIT

1838 PRINT 81: CHR\$ (255) & CHR\$ (255):: CLOSE 81:: 60T0 361

3000 L1=INT(LN/256):: L2=LN-2568L1 :: L8=CHR\$(L1)&CHR\$(L 2)&CHR\$(147):: LN=LN+10 :: R ETURN 3010 SUBEND

RUN that, type NEW, then MERGE DSK1. WRITE, and you will have a program consisting of DATA statements containing the hex codes for all the upside-down characters. Add a line 100 FOR CH=33 TO 127 READ CHS :: CHAR(CH, CH\$):: NEXT CH, and you can turn everything upside-down in only 12 seconds.

Someone sent me a classified ad, clipped from an unknown publication, which read -

TI-WRITER COMPANION.
Loaded with ingenious ways
to make your TI-Writer more
effective. Well written.
Send \$2.50 to Dr. Bill
Browning, 7541 Jersey Avenue
North, Brooklyn Park, MN
55428. Money back
quarantee.

I sent off my money and have just received 29 pages, 3-hole punched, loaded with useful and ingenious tips and ideas for getting more out of TI-Writer. I recommend it - it's worth twice the money and then some!

The K-Town newsletter recently published a utility routine that is so useful that I want to pass it on to everyone. If a program is not resequenced after it is modified, this will compare

it with the original and prepare a MEKGE format file of all the changes, for the use of others to update their copy.

140 !Version 85.0406.1XB Requires disk drive.
Compares two programs, gives list of all differences.

150 !SAVE old program in MERGE format (SAVE DSK1.(ol dfilename), MERGE). SAVE updated program in MERGE format(SAVE DSK1.(newfilename) , MERGE)

160 !RUN this program, answer prompts for OLD FILE name, NEW FILE name, and a different OUTPUT FILE name.

170 !When finished, type NEW , then MERGE DSK1.(outputfil ename) and ENTER

180 !Can be MERGED into othe r copies of OLD program to update them

198 DEF @(@\$)=ASC(SE6\$(@\$,1, 1))\$256+ASC(SE6\$(@\$,2,1)) 200 A\$=CHK\$(255)&CHK\$(255):: DISPLAY AT(1,1)ERASE ALL:*0

LD FILE: ": "NEW FILE:
": : "OUTPUT FILE:

210 ACCEPT AT(1,13)BEEP:BS:
: ACCEPT AT(3,13)BEEP:CS::
ACCEPT AT(5,13)BEEP:DS:: OP
EN #1:BS,INPUT,VARIABLE 163
220 OPEN #2:CS,INPUT,VARIABLE 163:: OPEN #3:DS,OUTPUT,
VARIABLE 163

238 LINPUT \$1:85 :: LINPUT \$
2:E5 :: F5=SE65(@5,1,2):: 65
=SE65(E5,1,2):: A=@(F5):: B=
@(65)

240 1F F\$=A\$ AND 6\$=A\$ THEN CLOSE 01:: CLOSE 02:: PRIN T 03:A\$:: CLOSE 03:: STOP 250 1F B>A THEN PRINT 03:F\$& CHR\$(131)&* **DELETED LINE \$ **&CHR\$(0):: LINPUT 01:: @\$:: F\$=SE6\$(@\$,1,2):: A=@(F\$):: 6010 240

260 IF A)B THEM PRINT #3:E\$:: LINPUT #2:E\$:: 6\$=\$E6\$ (E

\$,1,2):: B=0(6\$):: 60T0 240 270 IF 05<>E\$ THEN PRINT 03: E\$ 280 60T0 230

Thanks to some ideas from Joyce Corker, I have made some more improvements to the Tigercub Menuloader, and I have used the above utility routine to list all the changes made since it was published in Tips#15.

180 'by A. Kludge/N. Sordon/

T. Boissau/J. Peterson/etc.

Bodified in Tips 822

182 OPTION BASE 1 :: DIM P68
(127), VV(127), VX(127):: 60T0

118

185 & A, A\$, B, C, D\$, FLA6, I, J, K
, KD, KK, N\$, NN, P\$, P6\$(), Q\$, \$, \$
T, T\$(), TT, VT, VV(), VX(), W\$, X,
X\$, K2, \$2

186 CALL INIT :: CALL LOAD :
CALL LINK :: CALL PEEK ::
CALL LINK :: CALL SCREEN :: C
ALL COLOR :: CALL SCREEN :: C
ALL VCHAR :: CALL SOUND :: !
EP
158 ! \$\$DELETED LINE \$\$

150 ! ##DELETED LINE ##
160 T\$(1)="d/f" :: T\$(2)="d/
v" :: T\$(3)="1/f" :: T\$(4)="
i/v" :: T\$(5)="pro" :: ON WA
RNING NEXT
170 IMAGE ###

180 DISPLAY AT(1,4): "TIGERCU B MENU LOADER"

218 DS="DSK1." :: OPEN #1:DS
,INPUT ,RELATIVE,INTERNAL ::
INPUT #1:NS,A,J,K :: DISPLA
Y AT(1,2)SIZE(27):SE6s(DS,1,
4)&" - Diskname= "%NS;
238 FOR X=1 TO 127 :: IF X/2
B<>INT(X/28)THEN 268

240 DISPLAY AT(24,1): "Type c hoice or 0 for more 0" :: AC CEPT AT(24,27) VALIDATE(DIGIT)SIZE(-3):K :: IF K=0 THEN 2 50 :: IF VV(K)<>5 THEN 411 :

50 :: IF VV(K)(>>> THEN 411 : : IF K>0 AND K(NN+1 THEN 420 ELSE 240

290 DISPLAY AT(X+4,2):USIN6 170:NN :: DISPLAY AT(X+4,6): P\$:: P68(NN)=P\$:: DISPLAY AT(X+4,18):USIN6 170:J :: DI SPLAY AT(X+4,22):T\$(ABS(A)) 291 VV(NN)=ABS(A):: VX(NN)=A

295 IS=" "&STKS(B):: DISPLA

Y AT (X+4,26):SE65(15,LEN(15)
-2,3):: VT=VT+J
350 DISPLAY AT (X+6,1): C
hoice? :: ACCEPT AT (X+6,16)
SIZE(3) VALIDATE (DIGIT):K ::
IF K<>NN AND K<>NN+1 THEN 41
0
410 IF K<1 OR K>127 OR LEN(P
65(K))=0 THEN 320

411 IF VV(K)=5 OR(VV(K)=4 AN D VX(K)=254) THEN 429 412 ON ERROR 417 :: CALL CLE AR :: OPEN 82:D\$\delta\text{P6}\$(K):: CA LL SCREEN(16)

413 LINPUT 02:WS :: IF EOF(2)THEN 416 :: PRINT WS 414 CALL KEY(0,K,S):: IF S=0 THEN 413

415 CALL KEY(0,K2,S2):: IF S 2(1 THEN 415 ELSE 413 416 CLOSE #1 :: CLOSE #2 ::

417 DISPLAY AT(12,10): "UNLIS TABLE" :: CALL SOUND(200,110 .0):: RETURN 400

430 ON ERROR 417 :: CALL INI T :: CALL PEEK(-31952,A,B):: CALL PEEK(A\$256+B-65534,A,B):: C=A\$256+B-65534 :: A\$=D\$ &P6\$(K):: CALL LOAD(C,LEN(A\$

The Henu Loader will now list up to 127 programs files, showing the and number of sectors in each and the file type, record type and record length of each file. It will stop at the end of each page, and continue on a default value 0, or will stop for selection when any key is It gives disk aressed. name, number of sectors used and available. It adds up sectors actually used and gives a warning if all sectors are not accounted for. It will load and run any program which can be loaded from Extended Basic, displaying the program being loaded. It will delete any program or file, after first displaying the filename and requesting verification. It will list any listable file to the screen, pausing on any key input, and can be

very easily modified to list to a printer. If a file is not listable, it will inform you so, and restart the selection. It has one pre-scan option to speed it

Fairly often, the disk directory will lose track of one or a few sectors during process of loading records, even though the Disk Manager showed all 358 were initialized. That's I put the checking routine in the Menu Loader. The figure shown as "used" is actually 358 minus the number of sectors still available, and is checked against the total sectors of all files.

The loss of a few sectors is no serious matter, but once in a great while you may notice that the "available" and "used" sector quantities have obviously been reversed have found that this is a signal that the disk is about to go haywire and you had best back it up immediately!

Programs and files are loaded in the sector, available and in the continued available sector. number of small files are deleted from a disk, and a long file is then loaded, it may thus be fractured into many parts. If you have a work disk on which you continually add and delete files of various lengths, it will become badly fractured. This can cause disk errors. and it also badly overworks your drive. It is a good idea to recopy your work disk occasionally - file by file, not sector by s with a quick copier.

MEMORY FULL! - Jie Peterson

TIPS FROM THE TISERCUB

823

Copyright 1985

TIGERCUS SOFTMARE 156 Collingwood Ave. Columbus, OH 43213

Distributed by Tigercub Software to TI-99/4A Users Groups for promotional purposes and in exchange for their newsletters. May be reprinted by non-profit users groups, with credit to Tigercub Software.

The entire contents of Tips from the Tigercub Nos. 1 through 14, with more added, are now available as a full disk of 50 programs, routines and files for just \$15.00 postpaid!

Nuts Bolts diskfull of 100 (that's right, 100!) IBasic utility subprograms in MERGE format, ready for you to serge into your own programs. Contents include 13 type fonts, 14 text display routines, 12 sorts and shuffles, 9 data saving and reading routines, 9 wipes, 8 pauses, 6 music, 2 protection, etc., and now also a tutorial on using subprograms, all for just \$19.95 postpaid!

And I have about 140 other absolutely original programs in Basic and XBasic at only \$3.00 each!(plus \$1.50 per order for casette, packing and postage, or \$3.00 for diskette, PPM) Some users groups charge their members that much for public domain programs! I will send you my descriptive catalog for a dollar, which you can then deduct from your first order.

This challenge was printed in Tips #21 -

100! The Unprintable Unkeyable Program!
110! To shuffle the numbers 1 to 255 into a random sequence without duplication
120! The strings contain the ASCII characters 1 to 127 and 128 to 255
130! Most of the ASCII characters below 32 or above 159 cannot be input from the keyboard
140! So how was this program programmed?
150 NS=*

!""#\$%%()#+,-./0 123456789:;<=>?@ABCDEF6H1JKL MNOPQRSTUYWXYZ(\1^_'abcdefgh ijklenopqrstuywxyz(!)~" 160 H2\$="

170 Ms=Ms&M2s

180 L=LEN(Ms):: RANDOMIZE ::
X=INT(L&RND+1):: N=ASC(SE6s
(Ms, X, 1)):: Ms=SE6s(Ms, 1, X-1
)&SE6s(Ms, X+1, LEN(Ms))

190 PRINT N;:: IF LEN(Ms)=0
THEN STOP ELSE 180

And here is the answer —
It was written by a program
that writes a program!
Key this in and run it to
create a MERGE format disk
file. Then type NEW, then
type MERGE DSK1.LONGSTRING
and you will have a RUNable
program consisting of lines
150-170 of the ouzzle!

100 DPEN #1: DSK1.LONGSTRING
", VARIABLE 163
110 LN=100 :: 60SUB 190 :: A
\$=L\$&"H\$"&CHR\$(190)
120 FOR J=1 TO 127 :: C\$=C\$&
CHR\$(J):: NEXT J :: A\$=A\$&CH
R\$(199)&CHR\$(127)&C\$&CHR\$(0)
130 PRINT #1:A\$
140 60SUB 190 :: B\$=L\$&"H2\$"
&CHR\$(190)
150 FOR J=128 TO 255 :: D\$=D
\$&CHR\$(J):: NEXT J :: B\$=B\$&
CHR\$(199)&CHR\$(128)&D\$&CHR\$(0)

160 PRINT #1:B\$
170 GOSUB 190 :: F*=L\$&*M\$*&
CHR\$(190)&*M\$**&CHR\$(184)&*M2

s"&CHR*(0)
180 PRINT 01:F0 :: PRINT 01:
CHR*(255)&CHR*(255):: CLOSE
01 :: END
190 L*=CHR*(INT(LN/256))&CHR
*(LN-256*INT(LN/256)):: LN=L
N+10 :: RETURN

Now type 10 remaining lines, and you will have a speeded-up version of the Timercub Scramble which was published in Tips #10. It is still not as fast as the CALL PEEK versions but is such sore useful because you can modify it to scramble a sequence of any length anywhere between 1 and 255. For example, to shuffle the numbers 100 to 150 into a random sequence without duplication, just add a line 175 MS=SE6\$ (MS, 100,50).

The method of writing a "program" that writes a program" was fully explained by John Clulow in the 99er magazine Vol. 1 Nos. 3 and 4. It is a little-used but very valuable technique.

For instance, Tips#9 contained the following routine to turn the alphabet upside-down.

100 FOR CH=33 TO 127 :: CALL CHARPAT(CH, CH\$):: FOR J=1 T O 16 STEP 2 :: X\$=\$E6\$(CH\$, J, 2)&X\$:: NEXT J :: CALL CHAR(CH, X\$):: X\$="" :: NEXT CH 110 INPUT A\$:: 60TO 110

The only trouble with that is that it takes about 50 seconds to run. Try this instead -

100 FOR CH=33 TO 127 :: CALL CHARPAT (CH, CH\$):: FOR J=1 TO 16 STEP 2 :: X\$=SE6\$ (CH\$, J, 2) & X\$:: NEXT J :: CALL WRITE (CH, X\$):: X\$="" :: NEXT CH 1000 SUB WRITE (CH, X\$):: IF FLAG=1 THEN 1010 :: FLAG=1 :: OPEN \$1: DSK1.WRITE", OUTPUT, DISPLAY, VARIABLE 163 :: LN =3000 :: 60SUB 3000

)&CHR\$(16)&I\$:: IF I(5 AMB CHC127 THEM LS=LS&CHR\$(179): : SUBEXIT

1020 X=0 :: PRINT 01:LS&CHRS
(0):: L9="" :: IF CH=127 THE
N 1030 :: 60SUB 3000 :: SUBE
XIT

1838 PRINT 81:CHR\$ (255) &CHR\$ (255):: CLOSE 81 :: 60T0 301

3000 L1=INT(LN/256):: L2=LN-2568L1 :: L9=CHR\$(L1)&CHR\$(L 2)&CHR\$(147):: LN=LN+10 :: R ETURN 3010 SUBEND

RUN that, type NEW, then MERGE DSK1. WRITE, and you will have a program consisting of DATA statements containing the hex codes for all the upside-down characters. Add a line 100 FOR CH=33 TO 127 READ CHS :: CHAR(CH, CH\$):: NEXT CH, and you can turn everything upside-down in only 12 seconds.

Someone sent me a classified ad, clipped from an unknown publication, which read -

TI-WRITER COMPANION.
Loaded with ingenious ways
to make your II-Writer more
effective. Well written.
Send \$2.50 to Dr. Bill
Browning, 7541 Jersey Avenue
North, Brooklyn Park, MN
55428. Money back
ouarantee.

I sent off my money and have just received 29 pages, 3-hole punched, loaded with useful and ingenious tips and ideas for getting more out of TI-Writer. I recommend it — it's worth twice the money and then some!

The K-Town newsletter recently published a utility routine that is so useful that I want to pass it on to everyone. If a program is not resequenced after it is modified, this will compare

RABID by Cullhame Gibbs

Here is a good game to play if you're feeling bloodthirsty. It was written by one of our members, Cullhane Gibbs, who is only 13 years old. What you have to do is defend yourself from the rabid knife-wielding maniacs. You are equipped with a flamethrower. Good luck!

100 REM *************** 110 REM . RABID 120 REM *BY CULLHANE GIBBS * 130 REM *IN EXTENDED BASIC.* 140 REM *JOYSTICKS REQUIRED* 160 CALL MAGNIFY(2) 170 RANDOMIZE 180 CALL CHAR(47, "002277FFFF 2A0000") 190 CALL CHAR(94, "123422256F 800451") 200 CALL CHAR(64, "3838107CBB 292A28") 210 CALL CHAR(124, "20502070A 8B0A844") · 220 CALL CLEAR :: CALL SCREE N(2) 230 FOR COLOUR=2 TO 12 :: CA LL COLOR(COLOUR, COLOUR+1,2): : NEXT COLOUR 240 PRINT " RABID": "BY C ULLHANE GIBBS": "NEEDS EXTEND ED BASIC": "AND JOYSTICKS" :: PRINT :: PRINT "INSTRUCTION S:" 250 PRINT "AVOID RABID,": "KNIFE WEILDING MANIACS.":"T O DEFEND YOURSELF" 260 PRINT "PRESS YOUR FIREBU TTON": "TO RELEASE A SHORT FL AME": "WHICH WILL BURN YOUR": "ATTACKERS.": "NEW SCREEN STA RTS WHEN ALL" 270 PRINT "ATTACKERS ARE KIL LED. ": "ONCE YOU ARE KILLED T HE": "GAME IS OVER. ": "YOU CAN

N-":"TO THE LEFT."

280 PRINT "PRESS ANY KEY"

290 FOR D=10 TO 50 :: CALL S

OUND(D,701,0):: CALL SOUND(100,-8,0):: CALL SOUND(-50,4,10):: CALL SOUND(-100,-2,0
):: NEXT D

300 CALL KEY(O,KEP,SEP):: IF

SEP=0 THEN 300 ELSE 310

310 CALL CLEAR

320 PRINT "SCORECHART:" :: P

RINT

FIRE ONLY": "IN ONE DIRECTIO

330 PRINT "@ MANIAC=100" :: PRINT :: PRINT "* YOU" :: PR 340 PRINT "PRESS ANY KEY TO BEGIN" 350 CALL SOUND(-1000,-8,0) 360 PRINT :: PRINT :: PRINT :: PRINT :: PRINT :: PRINT : : PRINT :: PRINT :: PRINT :: PRINT 370 CALL KEY(0,K,S):: IF S=0 THEN 370 ELSE 380 380 CALL CLEAR :: PRINT " GET READY, PLAYER!" :: PRINT : : PRINT :: PRINT :: PRINT :: PRINT :: PRINT :: PRINT 390 "OR TIME=1 TO 500 :: NEX T TIME 400 SCORE=0 410 CALL CLEAR 420 CALL SPRITE (#11,124,4,70 430 FOR SPRIT=1 TO 4 :: CALL SPRITE(#SPRIT,64,5,121,89): : CALL MOTION (#SPRIT, INT (RND *10)+1,-INT(RND*10)+1):: NEX T SPRIT :: MANIC=4 440 DISPLAY AT(1,3):"SCORE:" SCORE 450 CALL JOYST(1,X,Y):: CALL MOTION(#11,-Y*2,X*2): CALL SOUND(-3,-3,0) 460 CALL POSITION(#11, YPOS1, XPOS1) 470 CALL KEY(1,KE,ST) 480 IF ST =- 1 AND XPOS1]24 TH EN 490 ELSE 690 490 CALL SPRITE(#12,47,7,YPO S1, XPOS1-16) 500 CALL COINC(#12,#1,20,A): : IF A=-1 THEN 510 ELSE 540 510 CALL SOUND(1000,340,0):: CALL PATTERN(#1,94):: SCORE =SCORE+100 :: MANIC=MANIC-1 :: CALL DELSPRITE(#1) 520 CALL DELSPRITE(#12) 530 IF MANIC=0 THEN 430 ELSE 540

540 CALL COINC(#12,#2,20,A): : IF A=-1 THEN 550 ELSE 590 550 CALL DELSPRITE(#12) 560 CALL SOUND(1000,340,0):: CALL PATTERN(#2,94):: SCORE =SCORE+100 :: MANIC=MANIC-1 :: CALL DELSPRITE(#2) 570 CALL DELSPRITE(#12) 580 IF MANIC=0 THEN 430 ELSE 590 590 CALL COINC(#12,#3,20,8): : IF B=-1 THEN 600 ELSE 640 600 CALL DELSPRITE(#12) 610 CALL SOUND(1000, 340,0):: CALL PATTERN(#3,94):: SCORE =SCORE+100 :: MANIC=MANIC-1 :: CALL DELSPRITE(#3) 620 CALL DELSPRITE (#12) 630 IF MANIC=0 THEN 430 ELSE 640 640 CALL COINC(#12,#4,20,C): : IF C=-1 THEN 650 ELSE 700 650 CALL DELSPRITE(#12) 660 CALL SOUND(1000,340,0):: CALL PATTERN(#4,94):: SCORE =SCORE+100 :: MANIC=MANIC-1 :: CALL DELSPRITE (#4) 670 CALL DELSPRITE(#12) 680 IF MANIC=0 THEN 430 ELSE 700 690 CALL DELSPRITE(#12) 700 CALL COINC(#1,#11,16,T): : IF T=-1 THEN 740 ELSE 710 710 CALL COINC(#2,#11,16,U): : IF U=-1 THEN 740 ELSE 720 720 CALL COINC(#3,#11,16,V): : IF V=-1 THEN 740 ELSE 730 730 CALL COINC(#4,#11,18,W): : IF W=-1 THEN 740 ELSE 780 740 FOR DIP=1 TO 28 :: CALL MOTION(#DIP,0,0):: NEXT DIP :: CALL SOUND(-1000,-8,0):: CALL PATTERN(#11,94):: FOR D EL=1 TO 50 :: NEXT DEL 750 CALL DELSPRITE (#11):: DI SPLAY AT(23,3): "GAME OVER-ST ART AGAIN Y OR N" :: CALL KE Y(0,P,S):: IF S=0 THEN 750 : : IF P=ASC("n")THEN 770 760 IF P=ASC("y")THEN 400 EL SE 750 770 END 780 GOTO 450

CIRCLES

The program below which I modified from a Merry Xmas message to a Happy Mothers Day message is both special and unique. Its program displayes the formula for drawing a circle on the screen.

Look at lines 180 & 190, 230 & 240, and 280 & 290. Each pair of lines is the mathamatical equivalent of a circle. I hope you find this program of use.

100 REM 1984 FOR LEHIGH 99'E RS BY JACK SCHREIBER, LV99CS 110 CALL CLEAR :: FOR CX=5 T 0 8 :: CALL COLOR(CX,2,10)::
NEXT CX :: CALL SCREEN(10)
120 CALL CHAR(42, "6CEEFEFE7C
381000") 130 DISPLAY AT(7,9): "WISHING YOU" :: DISPLAY AT(9,14): "A " :: FOR DEL=1 TO 200 :: NEX T DEL :: J=1 140 FOR AA=6 TO 22 :: READ A \$:: DISPLAY AT(11, AA):A\$:: FOR DEL=1 TO 50 :: NEXT DEL :: NEXT AA 150 DATA H,A,P,P,Y,,M,O,T,H, E,R,S,,D,A,Y 160 RESTORE :: J=J+1 :: IF J =5 THEN 160 :: IF J>6 THEN J 170 FOR DELAY=1 TO 400 :: NE XT DELAY :: CALL CLEAR :: CA LL SCREEN(12):: CALL COLOR(2 ,7,1):: FOR N=1 TO 12 180 R=12-(08*SIN(N/J*PI)) 190 C=16-(08*COS(N/J*PI)) 200 CALL HCHAR(R,C,42) 210 NEXT N 220 FOR N=13 TO 25 230 R=12-(10*SIN(N/J*PI)) 240 C=16-(10*COS(N/J*PI)) 250 CALL HCHAR(R, C, 42) 260 NEXT N 270 A=6 :: B=6 :: FOR N=25 T 0 37 280 R=12-(A*SIN(N/J*PI)) 290 C=16-(B*COS(N/J*PI)) 300 CALL HCHAR(R, C, 42) 310 IF N=37 THEN GDSUB 340 320 IF A(1 THEN GOTO 350 330 NEXT N 340 A=A-2 :: B=B-2 :: N=25 : 350 CALL SCREEN(12):: FOR I= 1 TO 600 :: NEXT I :: CALL S CREEN(10):: FOR K=1 TO 600 : NEXT K :: GOTO 140

навьх мотнех вах

SELECTION GUIDE

TI EDUCATIONAL SOFTWARE

AGE	SUBJECT	PROGRAM
Preschool (2-5 Years)	Early Learning	Early Learning Fun Early Logo Learning Fun
Early Elementary (5-7 Years)	Reading	Early Reading Reading Fun
	Spelling	Hangman
	Math Math	Number Magic Addition/Subtraction I Addition/Subtraction II Numeration I
	Art	Video Graphs
Middle Elementary (8-9 Years)	Reading ·	Beginning Grammar Reading On Reading Roundup
	Spelling	Scholastic Spelling Levels 3 & 4
	Math	Multiplication I Meteor Multiplication Division I Alligator Mix Minus Mission Alien Addition
Late Elementary (10-12 Years)	Reading	Reading Flight Reading Rally
	Spelling	Scholastic Spelling Levels 5 & 6
	Math	Demolition Division Dragon Mix Numeration 11
	Music	Music Skills Trainer Computer Music Box
Early Elementary to Junior High (5-14 Years)	r Ero Horistin # 0,4-,6-) (antide	Addison-Wesley Computer Math Games II, III, IV, VI
	Math	Milliken Math Series: Addition, Subtraction, Multiplication, Division, Integers, Fractions, Decimals, Percents, Laws of Arithmetic Equations, Measurement Formulas
	Computer Programming	TI LOGO II
Junior High to Adult	Logic	Video Chess
	Typing	Touch Typing Tutor
	Physical Fitness	Physical Fitness
	Business	Market Simulation (Disk)
	Computer Programming	Teach Yourself BASIC Beginner's BASIC Tutor Teach Yourself Extended BASIC

4 95

```
Next Rectines: by Ed York
116 !
                                                         I would like to announce the next two meeting dates of the Cin-Day
120 FOR EXTENSED BASIC
                                                         User Group. The secting dates, times and locations are as follows:
130 !
140 !WRITTEN BY:
                                                                Saturday, June 29, 1985
                                                                                                     Saturday, June 29, 1985
150 !
                                                                                                               Moon
                                                                         Moon
  D !ROY T. TAMASHIRO.
                                                                    Shillita/Rikes
                                                                                                         Shillito/Rikes
-/0 !
                                                                    Bountown Dayton
                                                                                                        Downtown Cincinnati
180 !WRITTEN:
                                                               Second and Ludlow Streets
                                                                                                     Seventh and Ela Streets
190 !
                                                                                                       Sixth Floor Gallery
                                                                 Fifth Floor Coin Room
200 IDECEMBER OF 1984
210 !
220 !REQUIRES:
230 !
                                                                Saturday, July 27, 1985
                                                                                                     Saturday, July 27, 1985
240 'EXTENDED BASIC AND
                                                                         Noon
                                                                                                               Noon
250 1
                                                                    Shillito/Rikes
                                                                                                          Shillitio/Rikes
260 !32K MEMORY EXPANSION
                                                                    Downtown Dayton
                                                                                                        Downtown Cincinnati
270 !
                                                               Second and Ludlow Streets
                                                                                                     Seventh and Ele Streets
                                                                Second Floor Auditorium
                                                                                                        Sixth Floor Gallery
290 !
300 !DISKETTE
310 !
320 CALL INIT
330 CALL LOAD(8196,63,216):: CALL LOAD(16344,66,83,67,82,78,32,50,108,68,73,83,80,76,32,48,190)
340 CALL LOAD(16360,73,78,80,85,84,32,49,36,67,76,83,32,32,48,78,70,79,82,84,89,32,48,38)
350 CALL LDAD(12288, 8, 31, 16, 0, 50, 190, 0, 0, 0, 0, 1, 108, 51, 188, 0, 0, 0, 0, 0, 0, 2, 12, 50, 116)
360 CALL LOAD(12312,215,32,47,190,215,32,47,191,13,0,1,108,2,107,2,224,131,224,2,1,240,129,216,1)
370 CALL LDAD(12336,131,212,216,1,140,2,6,193,216,1,140,2,2,1,245,135,216,1,140,2,6,193,216,1)
380 CALL LOAD(12360,140,2,4,96,48,86,2,224,48,0,6,160,48,98,4,224,131,124,2,224,131,224,4,96)
390 CALL LOAD(12384,0,112,4,192,2,1,128,0,4,32,32,32,5,128,2,128,3,192,22,250,4,91,2,1)
400 CALL LOAD(12408,0,1,4,192,4,32,32,12,200,32,131,74,48,36,192,224,48,36,2,67,0,255,2,2)
  O CALL LDAD(12432, 255, 215, 2, 34, 0, 40, 6, 3, 22, 252, 200, 2, 48, 34, 2, 1, 0, 2, 4, 192, 4, 32, 32, 12)
-20 CALL LOAD(12456, 200, 32, 131, 74, 48, 36, 192, 96, 48, 36, 2, 65, 0, 255, 6, 1, 168, 1, 48, 34, 4, 91, 2, 224)
430 CALL LDAD(12480, 48, 0, 6, 160, 48, 118, 2, 1, 255, 0, 216, 1, 50, 189, 2, 1, 0, 3, 4, 192, 2, 2, 50, 189)
440 CALL LOAD(12504, 4, 32, 32, 20, 4, 197, 209, 96, 50, 189, 6, 197, 2, 6, 50, 190, 192, 32, 48, 34, 6, 160, 49, 28)
450 CALL LOAD (12528, 4, 193, 192, 86, 2, 33, 96, 0, 4, 32, 32, 32, 5, 128, 6, 160, 49, 28, 6, 5, 19, 9, 6, 193)
460 CALL LOAD(12552, 2, 33, 96, 0, 4, 32, 32, 32, 5, 198, 5, 128, 6, 5, 22, 236, 4, 96, 48, 86, 2, 128, 3, 192)
470 CALL LOAD(12576, 21, 251, 4, 91, 2, 224, 48, 0, 2, 2, 1, 0, 2, 1, 32, 0, 216, 129, 50, 190, 6, 2, 22, 252)
480 CALL LDAB(12600,6,160,48,118,2,1,0,255,192,32,48,34,160,64,2,129,3,192,18,2,2,1,3,192)
490 CALL LOAD(12624, 200, 1, 48, 36, 4, 196, 193, 64, 2, 1, 32, 0, 217, 1, 50, 191, 2, 1, 126, 0, 4, 32, 32, 32)
500 CALL LOAD(12648, 2, 1, 5, 0, 216, 1, 131, 116, 6, 160, 50, 34, 216, 32, 131, 117, 48, 32, 4, 193, 208, 96, 131, 117)
510 CALL LOAD(12672, 192, 5, 2, 129, 13, 0, 22, 18, 2, 1, 128, 0, 4, 32, 32, 32, 4, 224, 131, 124, 4, 192, 2, 1)
520 CALL LOAD(12696,0,3,6,196,216,4,50,190,2,2,50,190,4,32,32,16,4,%,48,86,2,129,7,0)
530 CALL LDAD(12720, 22, 13, 2, 1, 32, 0, 217, 1, 50, 191, 2, 33, 96, 0, 4, 32, 32, 32, 6, 0, 6, 4, 22, 245)
540 CALL LOAD(12744,4,96,49,36,2,129,8,0,22,17,2,1,32,0,217,1,50,191,2,33,96,0,4,32)
550 CALL LOAD(12768, 32, 32, 6, 0, 6, 4, 128, 32, 48, 34, 18, 181, 5, 132, 5, 128, 4, 96, 49, 86, 2, 129, 9, 0)
560 CALL LOAD(12792,22,2,2,1,32,0,2,129,32,0,17,169,217,1,50,191,2,33,96,0,4,32,32,32)
570 CALL LDAD(12816,5,132,5,128,136,0,48,36,18,158,6,0,6,4,4,96,49,86,4,193,2,0,32,0)
580 CALL LOAD(12840,2,2,255,0,4,32,32,28,144,32,131,124,19,26,144,160,131,117,19,243,2,3,0,5)
590 CALL LDAD(12864,6,3,2,1,9,192,6,1,22,254,4,32,32,28,144,32,131,124,19,11,144,160,131,117)
600 CALL LOAD(12888, 19, 228, 4, 32, 32, 28, 192, 195, 22, 239, 152, 32, 48, 32, 131, 117, 22, 220, 4, 91, 2, 224, 48, 0)
610 CALL LOAD(12912,6,160,48,98,2,0,3,0,4,193,4,32,32,32,5,128,2,128,3,192,22,250,2,0)
620 CALL LOAD(12936,224,1,216,0,131,212,6,192,4,32,32,48,2,0,3,32,4,32,32,48,2,0,7,23)
630 CALL LOAD (12960, 4, 32, 32, 48, 2, 0, 8, 0, 2, 1, 16, 0, 4, 32, 32, 32, 5, 128, 2, 128, 8, 31, 22, 250)
640 CALL LOAD(12984,4,96,48,86,0,255,0,32,32)
  O CALL LINK("FORTY"):: CALL LINK("CLS"):: CALL LINK("DISPL", 2,11, "FORTY COLUMN
```

ICO !FORTY-COLUMN SCREEN

ISPLAY"):: CALL LINK("DISPL",8,1,"ENTER A FOREGROUND COLOR:")

110 CALL LINK("INPUT",8,27,A*):: A=VAL(A*):: CALL LINK("DISPL",10,1,"ENTER A BAC

KGROUND COLOR:"):: CALL LINK("INPUT",10,27,B*):: B=VAL(B*)

120 CALL C(A,B):: CALL LINK("DISPL",14,1,"ENTER"):: CALL LINK("DISPL",16,3,"1

TO REPEAT"):: CALL LINK("DISPL",18,3,"2 TO END")

130 CALL LINK("DISPL",20,1,"ENTER YOUR CHOICE:"):: CALL LINK("INPUT",20,20,C*)::

IF C*="1" THEN 100 ELSE IF C*="2" THEN CALL LINK("BSCRN")

140 SUB C(A,B):: CALL LOAD(12350,16*(A-1)+(B-1)):: SUBEND

By R. K. Hallmark

Editor's Note: The following article was copied from the July, 1984 issue of "The Suncoast Beeper", Newsletter of the Suncoast 99er's of St. Petersburg, Florida.

Files, Records, and Fields:

File-A file is the way basic programs communicate data with external storage devices. Some typical external devices are:

Device	File Name	
Cassette Recorders	CS1 or CS2	
Disk Drives	DSK1 to 3	
Parallel Port	PIO	
Serial Ports	RS232/1 or	

Record-A group of data items which are stored together in a file.

Field-A single data item in a record. Each variable in your program will occupy one field of a record.

A file consists of one or more records and these records consist of one or more fields. When the computer transmits data to one of the devices listed above it sends one record at a time.

File Attributes:

Files may be organized in a number of different ways depending upon the device being used and what the file is being used for. The organization and other charactheristics of a file are called its attributes. When data files are opened in BASIC (using an OPEN statement) you describe the file and its attributes to the computer. In the discussion below the order of the attributes and the terms used are the same as in your BASIC manual.

It is not always necessary to specify each of 'the attributes. In many cases the computer will select what is called a "default value" if you do not chose one. The default value that the computer will use depends upon both the device selected and the other attributes of the file.

- A. File #-May be any number from 1 to 255. (File #0 is the screen for output and the Keyboard for input.)
- B. Device Name-See list above.
- C. File Organization—the file organization refers to way individual records within the file can be accessed.
 - SEQUENTIAL—Data is read to or written from a file starting at the beginning and going through the file one record at a time, you cannot skip around. All files except disk files can only be sequential. Sequential is the default for file organization.
 - 2. RELATIVE-True random access files. The records can be written to or read from in any order. Disk files can be either relative or sequential.
- D. File Type-this refers to the format in which the data is stored.
 - INTERNAL-The data is stored in the binary form in which it can be most easily used by the computer. Files stored on cassette or disk should be internal format.
 - 2. DISPLAY-The data is stored in ASCII format. This format is used for sending data to the parallel and serial interfaces. Display is the default for file type.

- E. Open Mode-Describes whether the file may be written to, read from, or both.
 - 1. UPDATE-The file may be both written to or read from. This is the default for open mode.
 - 2. OUTPUT-The file may only be written to.
 - 3. INPUT-The file may only be read from.
 - 4. APPEND-Allows you to add additional records to the end of the file.
- F. Record Type-Describes whether the file has FIXED or VARIABLE length records. All relative files have fixed length records.
 - 1. Cassette Files-These files may be specified as fixed or variable but the computer actually uses fixed length records which may be 192, 128, or 64 bytes long. The default for cassettes is UARIABLE with a maximum length of 64 bytes. The computer actually uses FIXED with 64 as the length.
 - 2. Disk Files-SEQUENTIAL disk files have the default length of 80 bytes and a maximum length of 254 bytes . RELATIVE disk files must be of fixed length and may be up to 255 bytes in length.
 - 3. The printer ports (RS232 and PIO have the default record type of FIXED with a length of 80 characters. Other lengths may be used.

Sample Cassette Programs:

Data Impet: 100 OPEN #1: "CS1", SEQUENTIAL, INTERNAL, OUTPUT FIXED 192 118 INPUT "NUMBER OF NAMES: ": NUMBER 120 FOR I=1 TO NUMBER 130 INPUT "LAST NAME: ": LNAMES 140 INPUT "FIRST NAME: ":FNAMES 158 INPUT "ADDRESS: ":ADDRESS\$ 160 INPUT "CITY: ":CITY\$ 170 INPUT "STATE: ":STATES 180 INPUT "ZIP: "ZIP 190 PRINT #1:LNAMES, FNAMES, ADDRESSS, CITYS.STATES.21P 208 NEXT 1 218 CLOSE #1 229 END

Data Output:

100 OPEN #1:"CS1", SEQUENTIAL, INTERNAL,
INPUT, FIXED 192

110 INPUT "NUMBER OF NAMES :":NUMBER

120 FOR I=1 TO NUMBER

130 INPUT #1:LNAMES, FNAMES, ADDRESSS,
CITYS, STATES, 21P

140 PRINT FNAMES: "";LNAMES

150 PRINT ADDRESSS

160 PRINT CITYS;",";STATES;"";21P

170 FOR DELAY=1 TO 2000

180 NEXT DELAY

190 NEXT I

200 CLOSE #1

210 END

```
# BYTE-LINE is the newsletter of the Decatur 99er Users' #
# Group, Published in Decatur, Illinois
1 The information contained in this newsletter may be
# reprinted by a recognized Users' Group which gives
proper recognition to the DECATUR 99ers.
# Advertising will be accepted if prepaid and camera
# ready. Advertising which in the opinion of the DECATUR #
# 99ers' is unacceptable will be returned with prepayment.#
                                              supplied to apply the explore.
# ADVERTISING RATES:
                      Submit Advertising to:
# FULL PAGE
                      Deactur 99er Users' Group
* HALF PAGE
          $10
                      P.O. Box 726
# QUARTER PAGES 5
                      Decatur, Illinois 62525
                      Attn: BYTE-LINE Editor
```

"A" - MEET LIMP LOF BOLE

SDAY JULY II, 1985

```
10 REM PROGRAM GIVING FRACTION FOR DECIMAL INPUT.
20 REM REVISED FROM MAY'85 ARTICLE IN BYTE MAGAZINE
30 CALL CLEAR
40 PRINT "DECIMAL?"
50 INPUT A
60 B=0
78 C=1
80 D=ABS(A-INT(A))
90 IF D=0 THEN 160
100 E=1/0
110 F=C
120 C=INT(E) *C+B
130 B=F
140 D=E-INT(E)
150 IF A*C() INT (A*C) THEN 100
160 PRINT : "FRACTION= "
170 PRINT : A*C; "/"; C
180 INPUT "AGAIN?": Z$
198 GOTO 38
```