Volume 1, No. 3 May, 1985

Mini-Mag 99

THE EXCLUSIVE MAGAZINE FOR TI-99/4A USERS

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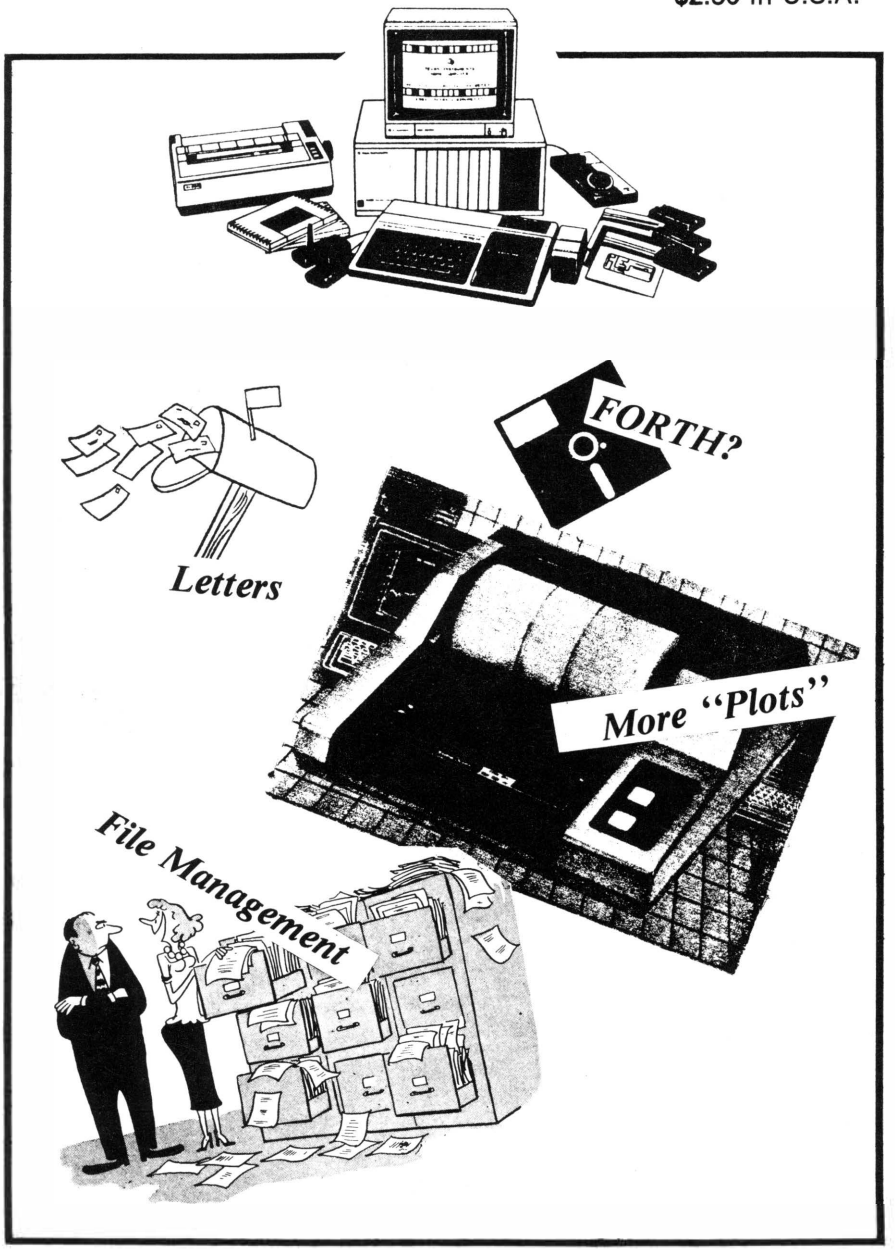

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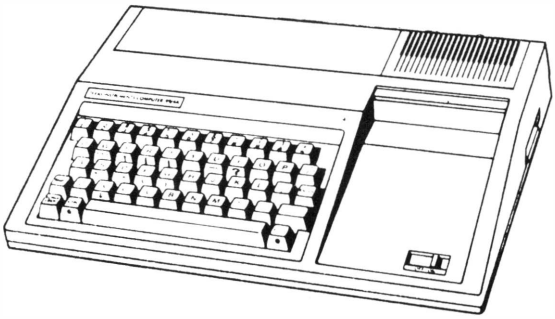

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LETTERS TO THE EDITOR

TI-99/4QI CORRECT INFO

CONGRATULATIONS! I was happy to receive the April issue. I wish to correct the info about the TI-99/4QI in the "Letters to the Editor" section. The TI-99/4QI is not a TI code for a specific circuit component and was sold by tens of thousands for over six months.

Let me explain! The 99/4QI is a Quality Improved (hence QI) version of the 99/4A mother board and power supply. On the QI version, many "chips" were integrated into a few and the circuit board layout was modified so that components could be inserted quicker. So we ended up with a computer which was easier to manufacture and superior in quality, but electrically identical to the 99/4A. The 99/4QI was manufactured from August '83 until March '84 and was only available in the beige colored console.

So for all those 99/4A owners tapping the keys of a beige console, you may very well be the owner of a QI.

Richard Payne
Quality Control Engineering
Texas Instruments

P.S. A quick way to spot a QI console is to examine the RF wiper of the I/O port (the port where the peripherals attach). If the metal RF shield is copper (gold colored), you have a 99/4A. If the shield is silver in color, you have a 99/4QI.

Thank you so much, Richard, for clearing matters up for us. We appreciate your interest.

MICROpendium

In the April issue of Mini-Mag 99, you referred to a publication entitled MICROpendium. I have been trying to locate this publication, but no one in this area has ever heard of it, including the local libraries.

I would appreciate any help you can provide in getting the address of the magazine and/or publisher. I am a TI-99/4A owner and understand this magazine has a lot of information on the TI system.

S.P.S., Lubbock, TX

MICROpendium is a publication which covers the TI-99/4A and its compatibles. You can subscribe to it by writing to MICROpendium, P.O. Box 343, Round Rock, TX 78680.

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I am fairly new to the computer field and am constantly looking for easy to follow, layman's terms instructions to accomplish various functions on my TI-99. I have expanded to a P-box Disk system with 32k and RS232. I now have a Star SG-10 printer. When using TI-WRITER, I find that the software causes the printer to form-feed a blank page before printing the text. This wastes paper and I would like to know if there is any way to correct that condition?

D.W.T., Mountain Lake Park, MD

You can alleviate the problem of paper waste by leaving your printer off until you have entered all of the information in the Fomatter except the final answer to PAUSE AT END OF PAGE? Here, you must enter Y (for "Yes"), and then press Enter. At this point, "WORKING . . ." appears on your screen. Turn on your printer, then push Enter. Your document will begin to print without feeding the extra page first. In this manner, however, you must push enter to print each page of your document.

There are two products on the market that replace the TI-WRITER cartridge and eliminate this problem. One is produced by Quality 99 Software, 1883 Columbia Rd. #500 Washington, D.C. 20009 and is called QS Writer. The other is produced by TEX-COMP, P.O. Box 33084, Granada Hills, CA 91344 and is Called 99-Writer II.

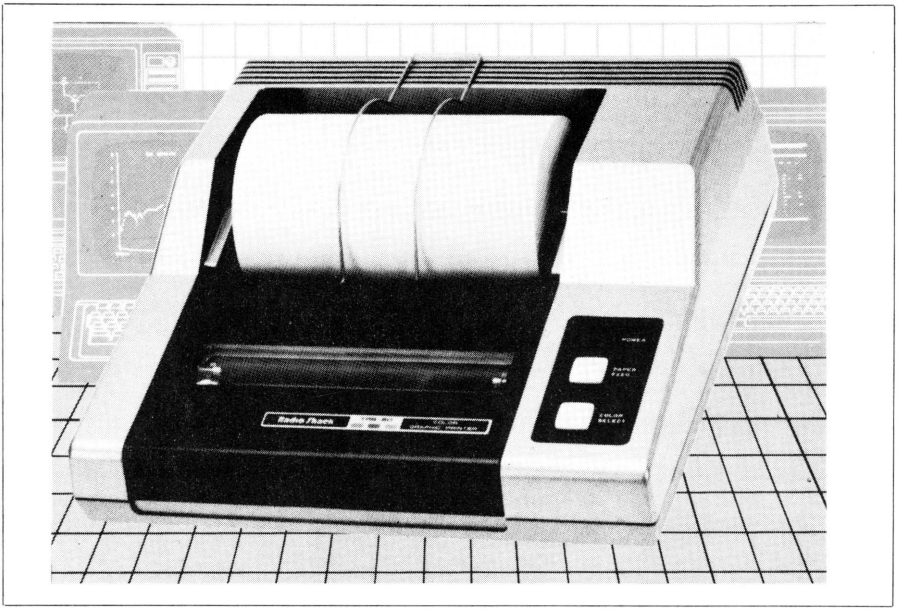
OOPS!

I think you may have made a little typo in your 99 Puzzle Vol. 1, No. 2. Sixth line from the bottom has "TSST" starting on the fifth letter. Since I could not find the four words that use these letters anywhere else, should they be "RAAR?"

D.S., Kimberly, WI

You are so right! Sorry about that!

Continued on Page 13



PLOTTING ON THE TI-99/4A

Using the Radio Shack CGP-115 Plotter Part 2

by Maurice E.T. Swinnen & Thomas Coppens

The manual that comes with the plotter contains a nice example of how to draw pie charts. Although it is written in TRS-80 Basic, Larry Hughes translated it into TI Extended Basic.

The data and the resulting division of the pie chart are purely ficticious. You are free to change the data statements at the end of the program to suit your particular taste. Once you examine the program more closely, you will discover how to modify it in order to change the colors, the striping and the size of the pie.

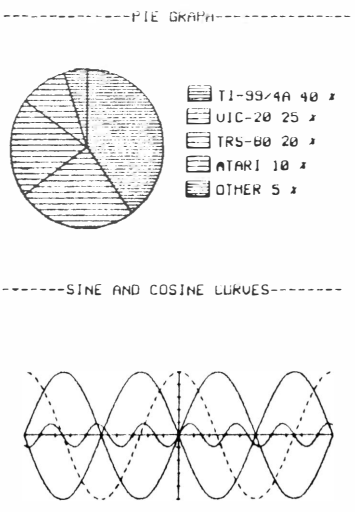


Figure 6, Pie Graph and Sine Wave Demonstration.

```
100 REM TI PIE CHART, FROM MANUAL
    P.39,TRANSLATED FROM TRS-80 TO
     TI XBASIC BY LARRY HUGHES,ENH
    ANCED BY MAURICE SWINNEN,FEB 1
    984
110 CALL CLEAR :: OPEN #1:"RS232/2
    .BA=600" :: PRINT #1:CHR$(18):
    "S4":"C0":"L0":"M70,-150":"IP
    TI-99/4A":"M0,-50":"S1"
120 PRINT #1:CHR$(17);CHR$(29);TAB
    (6);"COLOR";CHR$(29);"GRAPHIC"
    ;CHR$(29);" PRINTER";CHR$(29)
130 A$=CHR$(10):: PRINT #1:A$,A$:"
    ----------PIE GRAPH------
    ---------":A$:CHR$(18):"M0,-12
    0,120,-120":"I" :: GOSUB 250 :
    : PRINT #1:"M130,0,130,";(N-1)
    *15
140 FOR I=1 TO N :: PRINT #1:"I":"
    C";COLOR(I):"J0,20,30,0,0,-20,
    -30,0" :: J=0
150 PRINT #1:"M0,";J:"J30,0" :: J=
    J+PITCH(I):: IF J<20 THEN 150
160 PRINT #1:"M40,0":"P";NA$(I)::
    FOR K=1 TO 11-LEN(NA$(I)):: PR
    INT #1:"P" :: NEXT K :: PRINT
    #1:"P";U(I);UNIT$:"M0,0,0,-30"
     :: NEXT I :: PRINT #1:"M0,-10
    0":"A"
170 PRINT #1:"--------SINE AND COS
    INE CURVES--------":CHR$(18):"
    R0,-150,240,0":"IX1,-20,10":"H
    X1,20,10":"HX0,16,5":"HX0,-16,
    5":"C0":"L0"
180 B=30 :: H=15 :: C=0 :: GOSUB 2
    00 PRINT #1:"C1":"L3" :: B=-10
    0 :: H=80 :: C=0 :: GOSUB 200
    :: PRINT #1:"C2":"L5" :: B=100
     :: H=80 :: C=1
190 GOSUB 200 :: PRINT #1:"C3":"L0
    " :: B=100 :: H=80 :: C=0 :: G
    OSUB 200 :: PRINT #1:"M0,-150"
    :"C0":"A": : : : : :: CLOSE #1
     :: END
200 A$="M" :: FOR I=-200 TO 200 ST
    EP 4 :: S=I/80*PI :: IF C=0 THE
    N 210 ELSE 220
210 Y=INT(SIN(S)*H)
220 IF C=1 THEN 230 ELSE 240
230 Y=INT(COS(S)*H)
240 PRINT #1:A$;I;",";Y :: A$="D"
    :: NEXT I :: RETURN
250 READ R,N,M,UNIT$ :: FOR I=1 TO
     N :: READ NA$(I),U(I),COLOR(I
    ),PITCH(I):: NEXT I :: P2=2*(P
    I):: A$="M"

255 FOR I=0 TO 100 STEP 2 :: S=I/1
    00*P2 :: X=INT(SIN(S)*R):: Y=I
    NT(COS(S)*R):: PRINT #1:A$;X;"
    ,";Y :: A$="D" :: NEXT I
260 S=0 :: FOR I=1 TO N :: S=S+U(I
    )*P2/M :: X=INT(SIN(S)*R):: Y=
    INT(COS(S)*R):: PRINT #1:"MD";
    X;",";Y :: NEXT I
265 P=0 :: FOR I=1 TO N :: PRINT #
    1:"C";COLOR(I):: Q=P :: P=P+U(
    I):: QS=Q*P2/M :: PS=P*P2/M ::
     QX=INT(SIN(QS)*R)
270 QY=INT(COS(QS)*R):: PX=INT(SIN
    (PS)*R):: PY=INT(COS(PS)*R)::
    ST=R :: EN=-R :: IF QY>=0 AND
    PY>=0 THEN EN=0
280 IF QY<=0 AND PY<=0 THEN ST=0
290 FOR Y=ST TO EN STEP -PITCH(I):
    : J=0 :: RA=SQR(R*R-Y*Y):: IF
    Y=0 THEN RS=PI/2 :: GOTO 310
300 RS=ATN(RA/Y):: IF RS<0 THEN RS
    =RS+PI
310 IF QS<RS AND RS<PS THEN D(J)=I
    NT(RA):: J=J+1
320 RS=P2-RS :: IF QY=0 THEN 360
330 X=QX/QY*Y :: IF SGN(X)<>SGN(QX
    )THEN 360
340 IF SGN(Y)<>0 AND SGN(QY)<>SGN(
    Y)THEN 360
350 RT=SQR(X*X+Y*Y):: IF RT<=R THE
    N D(J)=INT(X):: J=J+1
360 IF PY=0 THEN 400
370 X=PX*Y/PY :: IF SGN(X)<>SGN(PX
    )THEN 400
380 IF SGN(Y)<>0 AND SGN(PY)<>SGN(
    Y)THEN 400
390 RT=SQR(X*X+Y*Y):: IF RT<=R THE
    N D(J)=INT(X):: J=J+1
400 IF QS<RS AND PS<PS THEN D(J)=I
    NT(-RA):: J=J+1
410 IF Y=0 AND J<>2 THEN D(J)=0 ::
     J=J+1
420 IF J<=2 THEN 450
430 FOR K=0 TO J-1 :: MINN=D(K)::
    MN=L :: FOR L=K+1 TO J-1 :: IF
     D(L)<MINN THEN MINN=D(L):: MN
    =L
440 NEXT L :: D(MN)=D(K):: D(K)=MI
    NN :: NEXT K
450 K=0 :: IF J<2 THEN 470
```

Figure 7, Pie Chart and Sine Wave Demonstration Program. Written in TI Extended Basic.

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```
460 PRINT #1:"M";D(K);",";Y :: PRI
    NT #1:"D";D(K+1);",";Y :: K=K+
    2 :: IF K<J-1 THEN 460
470 NEXT Y :: NEXT I :: RETURN
480 DATA 100,5,100,*
490 DATA TI-99/4A,40,3,4
500 DATA VIC-20,25,2,7
510 DATA TRS-80,20,1,7
520 DATA ATARI,10,3,7
530 DATA OTHER,5,0,4
```

A plotter, in spite of its ability to draw beautiful doodles, soon loses its attraction, unless it can be put to work on something useful. I wanted to see those equations I was forced to compute in college transformed into curves.

The curves can be shown two ways: in *Cartesian form* (on an X-Y axis) and in *Polar form*.

The first one did not pose too many problems in programming, and the second one was easily derived from the first one by modifying lines 170 and 190:

```
170 PRINT #1:"C";COLOR:"L";
    TYPE:"M";F(XMIN)*SIN(XMI
    N)*SCHAAL;",": -F(XMIN)*C
    OS(XMIN)*SCHAAL :: ON ER
    ROR STOP :: GOTO 180

190 ON ERROR 220 :: XACT =
    XACT + DX :: XP = F(XACT)*
    COS(XACT)*SCHAAL :: IF
      XACT XMAX THEN 230
      ELSE YP = F(XACT)*SIN
    (XACT)*SCHAAL :: CALL
      AFTOP(YP, -240,240)
```

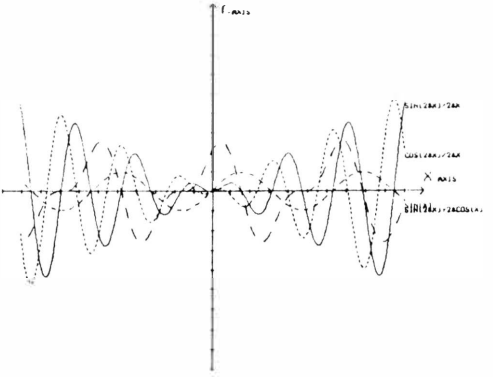

Figure 8, Example of Function Plotting. The user may choose the function, the beginning and ending values of X, the axis graduation, the resolution of the graph, the colors, the line types, and the number of functions per graph.

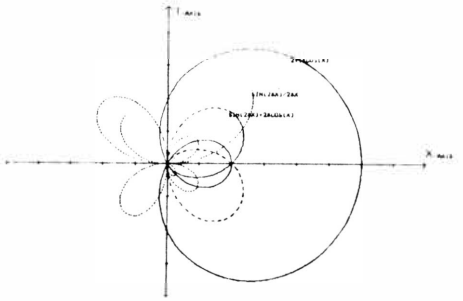

*Figure 9, Example of Polar Function Plotting. Comparing this figure to Figure 8, note the completely different appearance of a function such as "SIN (2*X)/2*X" in Cartesian versus Polar plotting.*

```
100 DEF F(X)=**********************
    **********************
    **********************
    **********************
    **********************
    ****************
110 CALL CLEAR :: CALL SCREEN(5)::
     CALL VCHAR(1,31,1,96):: FOR S
    ET=1 TO 12 :: CALL COLOR(SET,2
    ,16):: NEXT SET
120 CALL INIT :: OPEN #1:"RS232/2.
    BA=600"
130 GOSUB 310 :: !GOTO DISPLAY ROU
    TINE
140 FLAG=1 :: GOSUB 400 :: !GOTO I
    NPUT ROUTINE
150 CALL AFTOP(TYPE,0,15):: PRINT
    #1:CHR$(18):"A":CHR$(18):"M240
    ,";(XMIN-2)*SCHAAL:"I"
160 XACT=XMIN :: DX=1/RESOL :: ON
    ERROR 170 :: PRINT #1:"C";COLO
    R:"L";TYPE:"M";F(XMIN)*SCHAAL;
    ",";-XMIN*SCHAAL :: ON ERROR S
    TOP :: GOTO 190
170 RETURN 190
180 !PLOTTING ROUTINE
190 ON ERROR 220 :: XACT=XACT+DX :
    : XP=XACT*SCHAAL :: IF XACT>XM
    AX THEN 230 ELSE YP=F(XACT)*SC
    HAAL :: CALL AFTOP(YP,-240,240
    )
```

Figure 10, Function Plotting Program. Written in TI Extended Basic. This program also requires the 32k extended memory to run.

```
200 IF YP<=-240 OR YP>=240 THEN P$
    ="M" :: VLAG=1 ELSE IF VLAG=1
    THEN P$="M" :: VLAG=0 ELSE P$=
    "D" :: LX=XP :: LY=YP
210 PRINT #1:P$;YP;",";-XP :: GOTO
     190 :: !END WHILE
220 YP=240 :: RETURN 200 :: !ERROR
     ROUTINE
230 ON ERROR STOP :: PRINT #1:"M";
    LY-10;",";-LX:"S0":"Q1":"P";F$
    :"H"
240 !NEW FUNTION?
250 DISPLAY AT(24,17):"continue? Y
    " :: ACCEPT AT(24,27)BEEP SIZE
    (-1)VALIDATE("YNyn"):ANTW$
255 DISPLAY AT(24,1):: IF ANTW$="Y
    " OR ANTW$="y" THEN GOSUB 310
    :: GOSUB 430 :: GOTO 160
260 CALL ASPLOT(SCHAAL,XMIN,XMAX)
270 DISPLAY AT(24,18):"again ? Y"
    :: ACCEPT AT(24,26)BEEP SIZE(-
    1)VALIDATE("YNyn"):ANTW$ :: DI
    SPLAY AT(24,1)
280 PRINT #1:"M0,";-(XMAX+5)*SCHAA
    L :: IF ANTW$="Y" OR ANTW$="y"
     THEN GOTO 130
290 CALL CLEAR :: END
300 !
310 DISPLAY AT(3,4):"** FUNCTION P
    LOTTING **"
320 DISPLAY AT(7,2):"Minimum value
     of X: ";XMIN
330 DISPLAY AT(9,2):"Maximum value
     of X: ";XMAX
340 DISPLAY AT(11,2):"Graduation (
    cm) :  ";SCH
350 DISPLAY AT(13,2):"Resolution (
    pts/cm):";RESOL
360 DISPLAY AT(15,2):"Color 1, 2,
    3 or 4: ";COLOR+1
370 DISPLAY AT(17,2):"Line type (0
    -15) :  ";TYPE
380 DISPLAY AT(19,2):"Function:" :
    : DISPLAY AT(21,2)SIZE(27):SEG
    $(F$,1,27):: IF SEG$(F$,27,28)
    <>NUL$ THEN DISPLAY AT(23,2):S
    EG$(F$,27,28)
390 RETURN
400 ACCEPT AT(7,23)SIZE(-7)VALIDAT
    E(NUMERIC):XMIN
410 ACCEPT AT(9,23)SIZE(-7)VALIDAT
    E(NUMERIC):XMAX
420 ACCEPT AT(11,23)SIZE(-3)VALIDA
    TE(DIGIT,"."):SCH :: SCHAAL=SC
    H*50
430 ACCEPT AT(13,23)SIZE(-3)VALIDA
    TE(DIGIT):RESOL
440 ACCEPT AT(15,23)SIZE(-1)VALIDA
    TE("1234"):COLOR :: COLOR=COLO
    R-1
450 ACCEPT AT(17,23)SIZE(-2)VALIDA
    TE(DIGIT):TYPE
460 ACCEPT AT(23,2)BEEP:G$ :: IF G
    $<>NUL$ AND G$<>F$ THEN F$=G$
    :: CALL CODEER(F$)
```

Continued on Page 10

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MINI-MAG 99 is looking for articles and/or programs that would be of interest to TI-99/4A Computer Owners and Users.

If you have any new ideas or fresh approaches to the use and/or programming of the TI-99/4A, we would be happy to consider publishing your information.

Suggested subjects are: Applications, hardware, software, education, and games, just to name a few.

Manuscripts must be typed double-spaced and, if your article includes a program, submitted with disks or cassettes (you may use both sides). Manuscripts will be returned **only** if accompanied by sufficient first class postage and a self-addressed envelope.

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TI-WRITER
File Management

By Leslyn Tepper

One of the most important concepts for the TI-WRITER user is that of file management. Good file management will not only save you a lot of time, but it will enable you to become more flexible with your documents.

By using the **.IF (Include File)** command you can combine several different files into one master file for printing.

Perhaps you have files that must be entered in different ways. For instance, some in fixed mode (i.e., charts and tables) and some in word wrap mode (text).

You can set up each portion of your complete document in a separate file, and then, create a file with all of your necessary parameters (margins, headers, footers, indents, justification, etc.) and call, in order, those files you wish to include in the document. The text formatter will do the rest.

The text formatter considers these files to be a single file. Any formatting commands that are currently in effect when a file is called will remain in effect unless the file has its own commands that cover the same options.

It is important to remember that you cannot "nest" the include file commands. In other words, only the master file can call for each file. You **may not** include a file that has an include file command within *its* file.

You can include a file by either the disk name or the disk drive number, but you must be careful to use the correct name or drive number. If you don't, your file will not be found when it is called, which can create a problem when you need your document to be complete. It's always a good idea to keep a list of your file and/or disk names.

There are three major ways to use the Include File to print out strings of files.

The first is the application of several files because of the length of your document. Perhaps you've written a book or a play and you have saved each chapter in a different file. The overall form, however, is the same, and any text formatter commands will apply to *all* of your files.

Therefore, these common commands can be stated in your main file *prior* to any Include File Commands.

```
.FI(CR)
.AD(CR)
.LM 8;RM 72(CR)
.IN +5(CR)
.PL 59(CR)
.HE Document Title(CR)
```

Continued on Page 13

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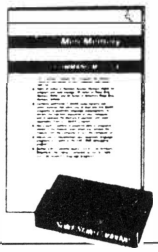

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Continued from Page 7

```
470 GOSUB 310 :: DISPLAY AT(24,20)
    :"ok? N"
480 ACCEPT AT(24,24)SIZE(-1)VALIDA
    TE("YNyn")BEEP:ANTW$ :: DISPLA
    Y AT(24,1):: IF ANTW$="N" OR A
    NTW$="n" THEN ON FLAG GOTO 400
    ,430 ELSE FLAG=2
490 RETURN
500 SUB ASPLOT(SCHAAL,XMIN,XMAX)
510 PRINT #1:"C]":"X0,";SCHAAL;","
    ;ABS(XMIN)*1:"H":"X0,";-SCHAAL
    ;",";ABS(XMAX):"H":"X1,";-SCHA
    AL;",";240/SCHAAL:"H":"X1,";SC
    HAAL;",";240/SCHAAL:"H"
520 XAS=-INT(XMAX*1)*SCHAAL :: PRI
    NT #1:"D240,0":"D235,5":"D240,
    0":"D235,-5":"HD0,";XAS:"D5,";
    XAS*5:"D0,";XAS:"D-5,";XAS*5
530 PRINT #1:"M";MAX((INT(220/SCHA
    AL)*SCHAAL),225);",";-10:"S1":
    "Q1":"PY":"S0":"P-AXIS":"S1":"
    M10,";-INT(XMAX*1)*SCHAAL-1:"P
    X":"S0":"P-AXIS":"H"
540 SUBEND
550 SUB AFTOP(VAR,MIN,MAX)!! VAR
    =MAX(MIN(VAR,MAX),MIN)
560 SUBEND
570 SUB CODEER(B$)
580 TELLER=0
590 FOR I=1 TO LEN(B$)
600 ACT$=SEG$(B$,I,1):: TEL=0
610 IF ACT$="(" THEN A=183 :: GOTO
    760
620 IF ACT$=")" THEN A=182 :: GOTO
    760
630 IF ACT$="+" THEN A=193 :: GOTO
    760
640 IF ACT$="-" THEN A=194 :: GOTO
    760
650 IF ACT$="*" THEN A=195 :: GOTO
    760
660 IF ACT$="/" THEN A=196 :: GOTO
    760
670 IF ACT$="^" THEN A=197 :: GOTO
    760
680 IF ACT$="X" THEN A=88 :: GOTO
    760
690 IF ACT$>"@" THEN ACT$=SEG$(B$,
    I,3):: I=I+2 :: GOTO 820 :: !*
    *** ALPHA
700 IF ACT$<"." OR ACT$>"9" THEN P
    RINT B$;" cannot be computed"
    :: END
710 !**** NUMBERS TREATMENT
720 IF ACT$="." OR(ACT$>="0" AND A
    CT$<="9")THEN TEL=TEL+1 :: IF
    I+TEL<=LEN(B$)THEN ACT$=SEG$(B
    $,I+TEL,1):: GOTO 720
730 TELLER=TELLER+1 :: CALL LOAD(-
    153+TELLER,200,TEL):: TELLER=T
    ELLER+1 :: ACT$=SEG$(B$,I,TEL)
740 FOR K=1 TO TEL :: TELLER=TELLE
    R+1 :: CALL LOAD(-153+TELLER,A
    SC(SEG$(ACT$,K,1))):: NEXT K :
    : I=I+TEL-1 :: GOTO 770
750 !****END NUMBERS
760 TELLER=TELLER+1 :: CALL LOAD(-
    153+TELLER,A)
770 NEXT I
780 FOR I=-153+TELLER+1 TO -26 ::
    CALL LOAD(I,0):: NEXT I
790 CALL LOAD(-159,7+TELLER)
800 GOTO 860
810 !**** TREATMENT ALPHA
820 RESTORE :: FOR K=1 TO 12 :: RE
    AD R$,A :: IF ACT$=R$ THEN GOT
    O 760
830 NEXT K
840 IF SEG$(ACT$,1,2)="PI" THEN A=
    221 :: I=I-1 :: GOTO 760
850 DATA ABS,203,ATN,204,COS,205,E
    XP,206,INT,207,LOG,208,MAX,223
    ,MIN,224,SGN,209,SIN,210,SQR,2
    11,TAN,212
860 !FUNCTION PLOTTING,Thomas Copp
    ens(TISOFT Belgium) & Maurice
    Swinnen(99er Club Washington D
    C)April 1984
870 SUBEND
```

A word of caution should be in order here. This program uses dynamic code modification. This means that the program modifies itself while running.

So, **Rule Number 1: Never make any changes to a program that has been run. Always load down, from disk, a copy of the program, as you typed it in. Never load to disk any program that has been run. Discard it by typing "New" and pressing "Enter."**

So, after you have loaded down a virgin copy and made all the necessary changes, *merge* it onto the disk with

SAVE DSK1.MYFILE,MERGE

Next *merge* the program from disk into the computer with

MERGE DSK1.MYFILE

And finally save the program on disk again with

SAVE DSK1.MYFILE

If you want to be super-careful, and if you find you need to make more changes, save the next version under the name MYFILE1, then next one under MYFILE2, and so on. When you finally have a version you like, save it under the name you

planned to use for it, such as FUNCTION or PLOTTER, or what have you. Then, and only then, discard all those MYFILE versions.

This program has to be entered EXACTLY as printed here. All those LOAD commands poke values into the 32k expansion memory. If you make any change to the program and then run it, before going through the gymnastics I described above, those poke addresses are not situated where they should be and the program will blow up.

Line 100 is especially tricky. There are exactly 127 asterisks to be put in. **NEVER PUT ANOTHER LINE AHEAD OF LINE 100.**

When you try to graph functions on the plotter, you will find out that you will produce a fair amount of "duds." The reason for it is that although the function is an interesting one, you specified limits of X during which the function might just be a flat line.

To save you from jangled nerves and paper, we wrote a function preview program. This program allows you to see (on screen) a list of X and F(X).

Since the screen only holds 24 lines, it will halt when full. Simply press the space bar to see the rest. At the end, you can see the list again or go to a new function (or the same one with new limits).

To use the program, first download from disk a copy of the FUNCTION program. Delete Lines 120 through 560 (if you have PROGRAMMING AIDS III, you can save some time by using the EDITOR program). Type in Lines 120 through 540 as shown in Figure 11.

```
100 DEF F(X)=**********************
    **********************
    **********************
    **********************
    **********
110 CALL CLEAR :: CALL SCREEN(5)::
     CALL VCHAR(1,31,1,96):: FOR S
    ET=1 TO 12 :: CALL COLOR(SET,2
    ,16):: NEXT SET
120 CALL INIT
130 CALL VCHAR(1,3,32,672):: GOSUB
     270 :: !GOTO DISPLAY ROUTINE
140 GOSUB 330 :: !GOTO INPUT ROUTI
    NE
150 CALL VCHAR(1,3,32,672):: DISPL
    AY AT(13,8):"When screen halts
    ":"        press space bar":"
            to continue"
155 FOR TIME=1 TO 400 :: NEXT TIME
     :: DX=(XMAX-XMIN)/N :: X=XMIN
160 FOR LINE=1 TO N :: DISPLAY AT(
    LINE,3):X :: DISPLAY AT(LINE,1
    6):F(X)
170 X=X+DX
180 IF LINE/24<>INT(LINE/24)THEN 2
    10
190 CALL KEY(0,K,S):: IF S=0 THEN
    190
200 IF K<>32 THEN 190
210 NEXT LINE
220 DISPLAY AT(22,1):: DISPLAY AT(
    24,1):: DISPLAY AT(23,3):"Same
     list again?" :: ACCEPT AT(23,
    20)BEEP VALIDATE("YNyn"):A$
230 IF A$="Y" OR A$="y" THEN GOTO
    150
240 DISPLAY AT(23,3):"START OVER A
    GAIN?" :: ACCEPT AT(23,22)BEEP
     VALIDATE("YNyn"):RESP$
250 IF RESP$="Y" OR RESP$="y" THEN
     GOTO 130 ELSE CALL CLEAR :: E
    ND
260 !DISPLAY ROUTINE
270 DISPLAY AT(3,4):"** FUNCTION P
    REVIEW **"
280 DISPLAY AT(5,2):"Minimum value
     of X: ";XMIN
290 DISPLAY AT(7,2):"Maximum value
     of X: ";XMAX
300 DISPLAY AT(9,2):"Number of poi
    nts:   ";N
310 DISPLAY AT(17,2):"Function:" :
    : DISPLAY AT(19,2)SIZE(27):SEG
    $(F$,1,27)
320 RETURN
330 ACCEPT AT(5,23)SIZE(-7)VALIDAT
    E(NUMERIC):XMIN
340 ACCEPT AT(7,23)SIZE(-7)VALIDAT
    E(NUMERIC):XMAX
350 ACCEPT AT(9,23)VALIDATE(DIGIT)
    :N
360 ACCEPT AT(21,2)BEEP SIZE(26):G
    $ :: IF G$<>NUL$ AND G$<>F$ TH
    EN F$=G$ :: CALL CODEER(F$)
370 GOSUB 270 :: DISPLAY AT(23,20)
    :"ok? N"
380 ACCEPT AT(23,24)SIZE(-1)VALIDA
    TE("YNyn")BEEP:ANTW$ :: DISPLA
    Y AT(23,2)
390 IF ANTW$="N" OR ANTW$="n" THEN
     GOTO 330
400 RETURN
```

Figure 11, Function Preview Program. This is not a PLOTTING program per se. It allows you to see X and F(X) on the screen before the actual plotting, saving both time and paper. This is NOT the complete program—see text for complete instructions.

If you are super neat, you might even do a RESEQUENCE here, but the program will work as is, IF YOU GO THROUGH THE SAME GYMNASTICS AS EXPLAINED ABOVE.

As you can observe in Figures 8 and 9, the plotter writes, on the graph itself, the function (as you entered it) for each curve. Note that the program does **NOT** recognize implied multiplication. You have to put an asterisk where you want multiplication to occur. Thus

```
2COS(2X)/2X
```

should be entered as

```
2*COS(2*X)/2*X
```

otherwise the program will halt with an error in line 100 called from somewhere else.

If you want to duplicate, as an exercise, the curves in Figure 8, the entered functions were

```
SIN(2*X)/2*X
COS(2*X)/2*X
SIN(X)
```

and

```
SIN(2*X)+2*COS(X)
```

The minimum value of X was −10 and the maximum was 10, while the graduation was .5cm. A resolution of 5 points per cm is usually adequate.

If you want smoother curves, use 10 points per cm. You will have to wait about twice as long for the plotter to finish.

In Figure 9, the functions were

```
2+4*COS(X)
SIN(2*X)/2*X
```

and

```
SIN(2*X)+2*COS(X)
```

The graduations were chosen 1cm and the limits of X were −6 and 6. In both figures, color and line type can be chosen to match individual taste.

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TI-WRITER

Continued from Page 8

.FO Page %(CR)
.IF DSK2.FILE1(CR)
.IF DSK2.FILE2(CR)
.IF DSK2.FILE3(CR)
etc.

If your files have no common parameters, and perhaps go in and out of Fixed Mode, include your text formatter commands in each file and simply use your Master File to call each file in its proper order:

.IF DSK2.FILE1(CR)
.IF DSK2.FILE2(CR)
.IF DSK2.FILE3(CR
etc.

Finally, if you have several different documents that you wish to print out without having to enter the formatter for each one, you simply set up a Master File to Include each file in the printing.

DATA FILES

Another great technique to save you a lot of time is using what I call "Data Files."

This technique is used while you are in the Text Editor. If you are going to input a document that goes from one setup to another (fixed mode with one set of margins to word wrap with another set of margins), you can first set up two data files with the specific Format Commands required for each section and save each to disk.

When you come to the point in the document where you need to enter this information, simply merge the file into your text buffer.

To do this you go into the Command Level (Function 9) and enter LF (load file), enter the line number in the text buffer after which the file is to be merged, a space, and the filename of the file to be merged, then press enter.

This is a terrific aid because you don't even have to set up these files in advance. You can be typing in your document, come to a portion that you feel you will need to use several times and, at that point, save the portion you want to use in a *data file.*

Go into command level (Function 9) and enter SF (save file), then type the number of the first line you wish to save, a space, the number of the last line you wih to save, a space and any valid filename.

These are just a few ways of saving you time and keeping your files more organized. Whether you wish to print a portion of a document or the entire thing, you will have a better grip on how to do it with good file management "under your belt."

LETTERS

Continued from Page 3

PEB MODIFICATION

In reviewing the articles contained in the March '85 issue of Mini-Mag, I found I had a couple of questions regarding the P-Code Problems article by W.R. Moseid.

Mr. Moseid indicated two solutions to improving ventilation and reducing noise level for the PEB.

1. "Replace existing fan with fan from TI Professional Computer." Is there a part number that can be referred to? Any modifications to TI-99/4A PEB?
2. "Cut a circle out in the PEB and place a wire shield in the hole." Where should the hole be cut? What size hole?

Thank you for your cooperation and assistance in this request.

R.L.S., Louisville, KY

Since those recommendations were received, I was advised by a TI exchange center that any modification will void the warranty and may even prevent out-of-warranty exchange. If noise or cooling is a real problem, you should remove the fan, take it to an electronics surplus store, and look for one of the same voltage that is more efficient and quieter.

Continued on Page 27

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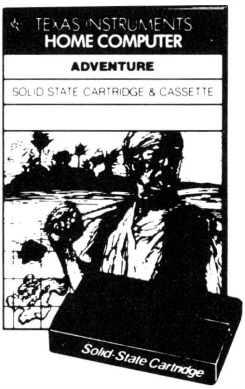

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WHY FORTH?

The Pros and Cons of the Forth Language, From the Standpoint of Someone Who Doesn't Use It.

by Jim Ness

During the last few years a number of relatively new programming languages have been fighting for the limelight, calling themselves the most user-friendly thing to come around since Jody Foster in Taxi Driver.

The big claim is always

". . . WITH THE SPEED OF ASSEMBLY LANGUAGE, BUT THE EASE OF BASIC."

Nice try. Nothing is as fast as assembly language, and few are as easy as Basic.

But my experience with Forth has convinced me that a language can come close to fulfilling those promises. I am not going to go into a big spiel about "Threaded Interpretive Languages" which would be tough to understand.

Let me put it this way, for those of you who have used assembly language called from a Basic or XBasic program, the closest thing to a Forth-type language would be a Basic program that has lots of CALL LINK statements in it.

Each Forth command, or "Word," is represented in the computer as a group of assembly language routines.

Each routine has its own word to represent it, call a "Primitive."

A useful Forth command is built by "threading" a number of primitives together. You end up with one word that really represents a bunch of simpler words.

Forth remembers all your definitions in a "dictionary," so it is always able to know what you are asking it to accomplish.

The point of all this explanation is to show that there is a lot of overhead—a lot of back-checking that has to be done for each upper level Forth word that is executed.

Therefore, no, it is not as fast as an assembly language program that is designed to do the same thing.

But it IS fast. Faster than Pascal, MUCH faster than Basic, even the compiled Basic available for the TI. Now, to confuse you even more, it is SLOW!

TI-Forth only holds 5k of program in memory at one time. Sound small? Actually, if you come up with one Forth word that represents, for instance, a word processor program, all you need is that one word as your whole program. Who needs lots of memory?

The fact is, most of the memory is taken up by the dictionary, to remember all of your definitions. You must load in your entire dictionary to run the program.

That's called "compiling" a Forth program. And for a complicated program, it can be very time-consuming.

So, say you decide to run your Forth word processor. You crank up the computer and expansion box, put your Editor/Assembler or Mini-Memory cartridge in, put your Forth disk in, and Load and Run "DSK1.FORTH."

In about 15 seconds, the program has SCRN 3 loaded (SCRN 3 is supposed to be the auto-loaded screen, so if you want a program to crank right up, you put the beginning there).

Now, it starts compiling. If all

your definitions do not fit onto SCRN 3 (1k of memory), your words in SCRN 3 direct Forth to the next screen. The disk drive loads another.

For a long program, you may be waiting for a good deal of time, while screen after screen gets loaded and compiled.

This is the slow part of the Forth language. Since Forth was designed to work with small computers, it uses the disk drives a lot to store info, instead of computer RAM.

It can be very distracting to have to put up with waiting for the disk drives to do their stuff. I hate it. I also hate the manual. I also hate making a boo-boo, and having to turn off the computer and reload the whole thing because of a program lock-up.

But there ARE advantages to Forth.

Forth gives you much better access to the video display area of your computer. You can use all 4 display modes with Forth.

The standard graphics mode
40-column text mode
Multicolor mode
Bit-Graphics mode

You also have more control of peripherals—faster file access; ability to use modes of file handling not available to Basic programmers; much faster arithmetic routines, both floating point and 8/16/32 bit numbers; and faster loops, for instance count to 10,000 in a loop in about 5 seconds.

Why not program in a Forth version of assembly language. It runs at Forth speeds, but uses a vernacular similar to real assembly language.

In short, Forth allows you to do anything that CAN be done on your machine, anything that you could do in assembly language. The difference is just speed.

If you are familiar with assembly language programming, and are comfortable using it, then Forth is a waste of your time. You can come up with assembly language routines that are cleaner and faster than the same in Forth, and with about the same amount of effort.

If you don't feel comfortable with assembly language, but want to get more out of your machine, try Forth.

Don't expect to learn Forth as fast as you learned Basic, but with a little work, you should be able to do some unbelievable things.

The TI manual leaves a lot to be desired. Remember that TI released this product after they announced their withdrawal from the market.

The product was not yet finished. So the software has a couple of bugs, and the manual is not a friendly piece of literature. There is a disclaimer at the front of the manual.

If you are really interested in Forth, there is also an independent product out produced by WYCOVE.

NEXT ISSUE:

- Business Utility Program—Part1
- TI-Writer
- Re-defining Characters
- New products
- Notes & News

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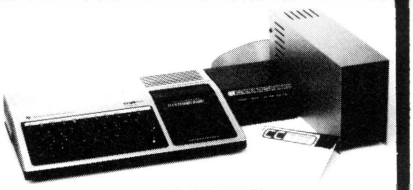

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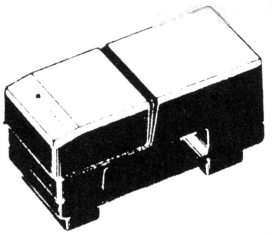

The above 4 modules are designed to work with the TI Speech Synthesizer so that all lesson words are pronounced.

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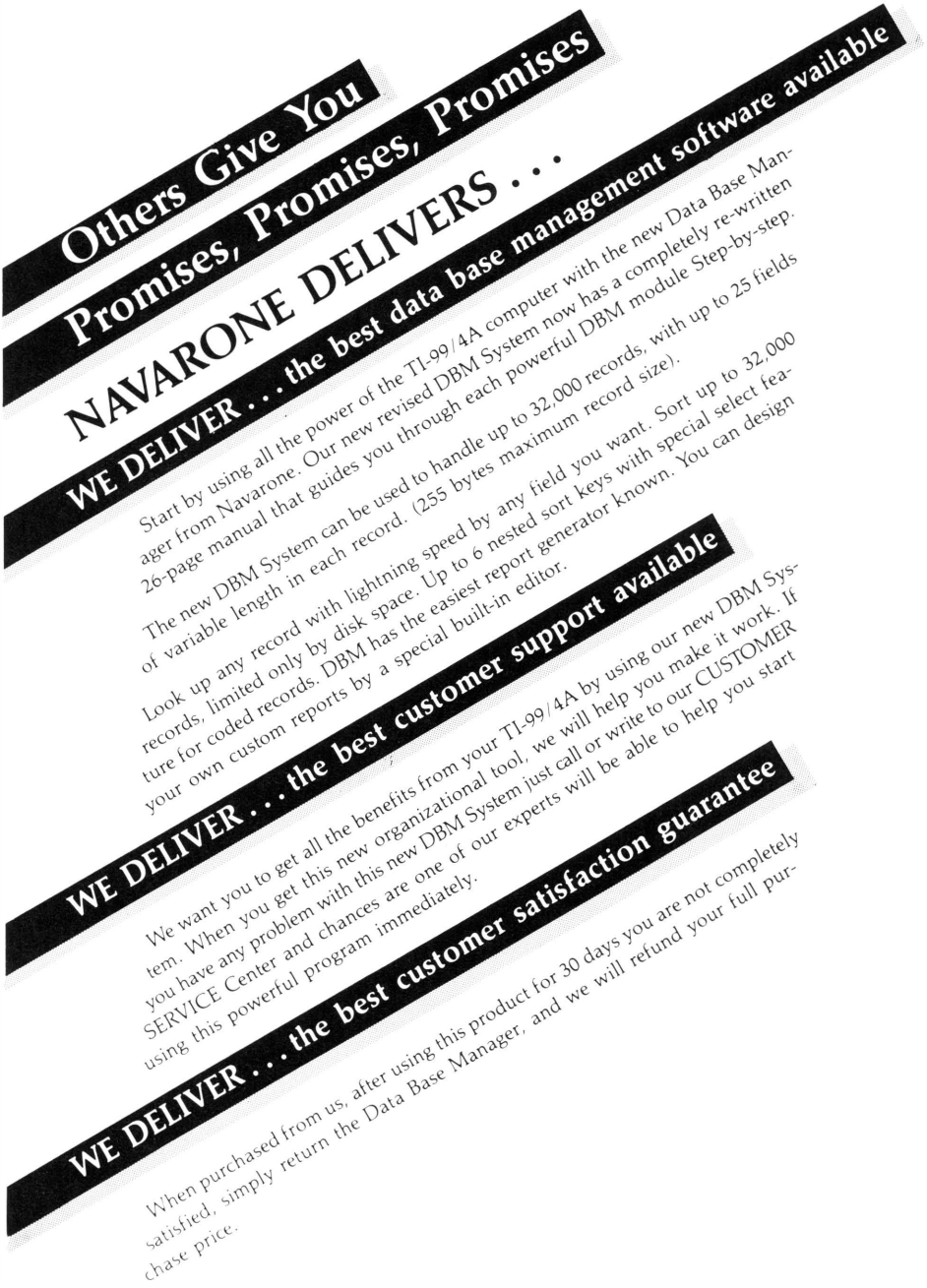

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TID-BYTES TO WET YOUR APPETITE

RIDGE SERVICES

RIDGE SERVICES, 170 Broadway, Suite 201, New York, NY 10038 has three rather interesting pieces of software to offer the TI-99/4A users:

Personal Social Register is an advanced computerized name, address, and telephone directory developed for the TI-99/4A. It combines menu-driven commands with an array of sophisticated user functions to produce an automated social event director. Reminding you of upcoming events in plenty of time to send out cards, gifts, etc., Personal Social Register is directed to busy professionals and anyone with large families or lots of friends and requires a disk system, memory exapnsion and X-Basic for $35.

Personal Inventory Program (PIP) is a unique household catloguer which stores complete details on all personal possessions. Its menu-driven commands make this a versatile yet simple program. In the event of a casualty, PIP will be able to supply all of the details required by Insurance Companies, Police Departments, and the IRS. Although the diskette version is faster, PIP is also available on cassette and requires X-Basic for $20.

Pro Football Analyst is a proven system for choosing both NFL and USFL winners against the point spread and is offered in BASIC. With a win rate of 66.3%, Pro Football Analyst excells in office football pools and Total Point selections. It takes 5 minutes a week to analyze a complete slate of games with statistics obtained from your local newspaper. Available on cassette or diskette at $34.95.

JOY PAINT 99

JOY PAINT 99 is among the newest releases from Great Lakes Software, 804 E. Grand River, Howell, MI 48843. Joy Paint 99 will be similar to the popular MacPaint. Joystick or keybord controlled, Joy Paint 99 contains utilities that allow the user to draw lines, circles, boxes, fill shapes with different patterns, type text on the screen, save to disk and make a full page printout. The retail price planned for Joy Paint 99 is $29.95.

Currently, Great Lakes Software offers a **Extended Business Graphs,** a menu-driven program for creating statistical graphs of your choice. After you input the specific data you wish to be charted, Extended Business Graphs compiles the data and produce either a bar graph, pie graph or line graph on your screen. It allows the user to save the information on the program disk to compile future graphs and/or direct the program to print the desired graph. Extended Business Graphs requires 32k memory expansion, X-Basic and one disk drive. $29.95

TE-4PLUS

TE-4PLUS is a high speed terminal emulator written in assembly language offered by TEX-COMP, P.O. Box 33084, Granada Hills, CA 91344. Full menu-driven protocol

setup is implemented, including port number, baud rate (110–9600), parity, stop bits, data bits and full or half duplex (local echo). Further setup is provided for screen and text colors, file system record length, and automatic linefeed. Incoming text may be saved (downloaded) in a 24k circular buffer, that can be dumped to disk, printer, or any other device, with user-selected record length (1–254) and optional filtering of linefeed and other control characters. TE-4Plus also has the capability to upload text files from a disk drive to the RS232 port, and to simultaneously send incoming text to a printer, 80-column card, or other peripheral. In addition, TE-4Plus has a true lowercase character set built in. TE-4Plus requires 32k memory expansion, one or more disk drives, RS232 interface with modem, and either the Extended Basic, Mini-Memory or Editor/Assembler cartridge. It sells for $19.95.

NEW FROM QUALITY 99

Quality 99 Software, 1884 Columbia Rd. #500, Washington, DC 20009, has added a few new items to their catalog.

QS-Writer allows you to run the TI-Writer disk without the TI-Writer module. The purpose of this program is to save the user time, the need to swap modules, and wear and tear on the console. Extended Basic, Editor/Assembler or Mini-Memory is required. Retails for $39.95 ($44.95 with TI-Writer files included).

QS-Converter will convert a text file into a runable program. The user creates or modifies programs using the editing capabilities of TI-Writer and can then convert the text file into a runable TI Basic or Extended Basic program. QS-Converter will also convert files downloaded from a BBS into a runable program. Disk, 32k and Extended Basic are required to run QS-Converter, which retails for $39.95.

The Duplicator is intended to aid the user in "backing up" program disks. The Duplicator copies in 2 passes for Single Sided/Single Density disks and 4 passes for Double Sided/Single Density Disks. It works with 1 or 2 drives and verifies the copy disk. The Duplicator has been developed to work with both TI and CorComp controllers and requires 32k with either Extended Basic, Editor/Assembler or Mini-Memory with a retail price of $19.95

MICROSTUFFER

Microbits Peripheral Products, 225 Third Avenue, SW, Albany, OR 97321 has introduced the **MicroStuffer Printer Buffer** to the computer market. MicroStuffer will receive print data at rates up to 8000 cps and send it to the printer at its own print rate, freeing the computer for the next job. Its 64K will hold approx. 45 pages of double spaced text, and since it has its own power supply, it continues to hold data even if the computer or printer is turned off. A built-in repeat function allows the user to print up to 255 copies of the data in the buffer's memory. Parallel or optional RS232 Serial interface is available. Retail is around $139.95.

If you know of any plans for new products, send details to:

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NOTES

TEXAS INSTRUMENTS IS OUT

Tex-Comp announced that it has just completed negotiations with Texas Instruments to purchase large quantities of the most popular TI-99/4A Software.

In consumating this transaction, Tex-Comp has acquired TI software with a retail value of well over a million dollars, which will enable it to continue to supply the TI user for years to come.

Texas Instruments, as of April 1, 1985, is officially out of the home computer business and in selling this remaining inventory to Tex-Comp has, in effect, transferred its responsibility of supplying the TI user.

One TI official stated that while limited amounts of TI software may still remain for a few selected titles at various mass merchandisers, this final transaction has placed one of the largest quantities and best selections of TI software available anywhere.

BEIGE CONSOLE PROBLEMS

It seems that the I/O port on the side of the beige console is giving some TI-99/4A users a problem.

When attaching some third party hardware to this port, the connection inside the console gets bent (due to misalignment). As long as everything is still working, that's not really a problem.

It has, however, been brought to our attention that Texas Instruments Service Centers are not honoring warranties on consoles that have been damaged in this way, because of the use of third party equipment.

SERVICE CENTERS ONLY!

Any problems with or returns of Texas Instruments hardware or software must be taken to your local Texas Instruments Service Center along with proof of purchase date if under warranty.

Replacements and/or repairs will be done at the centers. You may not take the merchandise back to the dealers for any replacement or repair. Again, this is for Texas Instruments brand items only.

DEVELOPMENT OFFER

In an attempt to expand the software library available for the Texas Instruments Professional Computer, John Schier, Manager of TIPC Marketing, is seeking out those of you who are software developers.

". . . in exchange for active members making software they develop available for the TIPC, we will offer them software developers' discounts."

The qualifications are that the developer must be an active member of a user's group, must have participated in a 99/4A Users Group Software Exchange Program, agree to submit one proogram for the TI Professional to a User Group within 12 months of purchase, and not resell any equipment purchased through this discount offer within 12 months of purchase.

John Schier said, "We believe this is an outstanding opportunity for User Group members to expand their personal computing capability.

Anyone who is interested in such an offer can contact John Schier, Texas Instruments, Inc., P.O. Box 2909, Austin, Texas 78769.

ENTER ROUTINE

by Maurice E.T. Swinnen

While translating the prompting of some European programs from Dutch, French and German into English, my eye caught a neat "ENTER" routine I hadn't seen before. It must be popular in Europe, as it was used in several of their programs.

After the first screen displayed the explanation of how the program worked, the usual message "PRESS 'ENTER' TO CONTINUE" was displayed at the bottom of the screen. The unusual thing was that the word "ENTER" was flashing on and off—putting emphasis on the word.

It is done very simply. The word "ENTER" is blanked out periodically by five blank spaces, as is shown in Line 1030.

The "ENTER" routine itself, which starts in this demo program at Line 1000, is a subroutine and may be called as many times as you want in your program.

Needless to say, this demo program is written in Extended Basic.

```
 100 CALL CLEAR :: DISPLAY AT(6,1):"
     This is a new ENTER routine." :
     : DISPLAY AT(10,1):"Would you l
     ike to try it?" :: GOSUB 1000
 110 CALL CLEAR :: DISPLAY AT(15,1):
     "Works nice, huh?" :: END
 120 REM
 130 REM
1000 REM *ENTER ROUTINE*
1010 DISPLAY AT(24,1):"Press ENTER t
     o continue." :: FOR X=0 TO 10 :
     : CALL KEY(0,Y,Z):: IF Y=13 THE
     N RETURN
1020 NEXT X
1030 DISPLAY AT(24,7):"     ";!5 spa
     ces
1040 FOR X=0 TO 10 :: CALL KEY(0,Y,Z
     ):: IF Y=13 THEN RETURN
1050 NEXT X :: GOTO 1000
```

Simulating this routine in TI-Basic is not difficult at all, in spite of the fact that "DISPLAY AT" is missing in that language.

We can use the "DISPLAY AT simulator," whose paternity (or maternity in some cases) has been claimed by many programmers. By modifying that simulator (Lines 10010 through 10100) slightly—adding the five-spaces-blanker (Line 10110) and a single CALL KEY statement that allows responding to an ENTER-key press (Lines 10120 through 10140)—we end up with a routine that is even more attractive and just as fast as the one written in Extended Basic.

It has one more advantage. It can be used in both TI-Basic and Extended Basic, although it's a little slower executing in the first one.

```
 100 CALL CLEAR
 110 PRINT "THIS IS A NEW ENTER ROUTI
     NE"::::::
 120 PRINT "WOULD YOU LIKE TO TRY IT?
     "::::::
 130 GOSUB 10000
 140 CALL CLEAR
 150 PRINT "WORKS NEAT HUH?"
 160 END
 170 REM
 180 REM
 190 REM
 200 REM
10000 REM  *ENTER ROUTINE*
10010 ROW=23
10020 COLUMN=6
10030 A$="PRESS ENTER TO CONTINUE."
10040 GOSUB 10060
10050 GOTO 10110
10060 FOR C=1 TO LEN(A$)
10070 CALL HCHAR(ROW,COLUMN,ASC(SEG$(A
      $,C,1)))
10080 COLUMN=COLUMN+1
10090 NEXT C
10100 RETURN
10110 CALL HCHAR(23,12,32,5)
10120 CALL KEY(0,Y,Z)
10130 IF Y=13 THEN 10150
10140 GOTO 10000
10150 RETURN
```

LETTERS

Continued from Page 13

DATABIOTICS

I am responding to your March, 1985 issue of MINI-MAG 99 on Page 22 and 23. There is an article on plans for a company called "DataBioTics." You mentioned a few pieces of software that I'm interested in getting. However, you did not include an address for the company. Please send me an address for the company.
D.G., Cherry Hill, NJ

The address for DataBioTics is:
DataBioTics
P.O. Box 1194
Palos Verdes Estates, CA 90274

"EXTRA" PARTS

My compliments on your new magazine and continued support to all TI-99/4A users. I have a few questions of importance to both readers and users:
1. Why does the cartridge port on the console heat up after being in use for a couple of hours; and does this hurt anything?
2. What of any of the supposed expanded TI-99/8, is it a rumor or truth? Do you have any inside information?
3. Why did TI sell all of its "extra" parts for the TI-99/4A to Radio Shack? Wouldn't it have been to TI's advantage to keep these parts for service in its service facilities or centers?
A.H., Harbor City, CA

Good questions! I'll answer each one by number:
1. The power supply for the console is located directly below the area of the cartridge port. It does not hurt anything, provided that the area surrounding the vent slots is not blocked. If you are really worried about it and wish to cool it down, there a couple of things you can do. Since the power supplies on the beige console runs cooler, and there are several of these power supplies available at computer surplus stores, simply replace your power supply with this cooler one. Another thing would be to use a small muffin fan next to your computer, with the air blowing over this portion of the console.
2. The expanded TI-99/8 is primarily rumor, although a handmade prototype may be built to encourage investors. People "in the know" don't feel that a 99/8 would be a commercially successful product, due to the unavailability of software and the current market conditions.
TI made a few 99/8 prototypes—the most famous is one owned by Don Bynum, a former TI engineer who has displayed it at a number of user group functions.
Tex-Comp, a 99/4A retailer has recently constructed several prototypes of advanced TI-99/4A computers, but does not feel that a retail market would support mass production.
3. In regard to the "extra parts," TI only unloaded components that it felt it had in "more than enough" quantities to support ongoing service & warranty replacement.

SPANISH CHARACTER SET

I am most impressed with your articles on the TI-Writer, and would like to ask for some help. I have had untold hassles with the TI-Writer and Impact Printer's instructions regarding typing out in the Spanish Character Set. In fact, the only program in the TI Impact Printer Manual that didn't work on my Epson compatible Manesman Tally Spirit 80, was the one for software switching to the Spanish Character Set. My wife works for PTA in two schools that are heavily Hispanic, and desperately needs something compatible with the TI-Writer that will do this in software—any help available?
M.V.L., Santa Monica, CA

I am not personally familiar with your particular printer nor the availability of the complete international character set within its functions; however, by simply using the Transliterate Function in your TI-Writer, you should be able to solve your problem.
For instance, at the beginning of your Spanish document insert the following Transliterate Commands:

```
.TL 92:110,8,126
.TL 94:8,39
```

The first one will change the reverse slash key (ASCII Code 92) into an "n" with a tilde above it (n, backspace, tilde). Therefore, every time you push the backward slash in your document, you will create an "n."
The second one will replace the circumflex with a backspace and an apostrophe (thus an accent over either the a, the e, or the i, whichever precedes this key).
With only two commands, you have all you need for the Spanish language since there are only those two differences from English.
On the other hand, if you do have access to an international character set within your printers commands (check your printer's manual), you simply access the set by use of an escape sequence to whatever your printer calls for.
For instance, to access this character set on the Gemini, Epson and Panasonic printers, you would Transliterate some key into an escape key, then use the escape sequence called for:

```
.TL 95:27,55,7
```

This turns the Underscore key into the necessary escape sequence.

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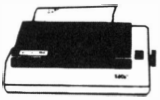

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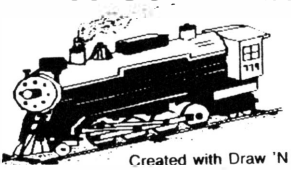

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