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Home Computer
Users Spotlight

a monthly publication of the
Milwaukee Area 99/4 Users Group

JUNE - 1987

MILWAUKEE AREA USER GROUP
4122 GLENWAY WAUWATOSA WI 53222

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B.I.G....Schroeder/Walden/Hitz	

Main Group Meeting
July 11, 1987
Wauwatosa 8&L 7500 W. State
12:00 Noon - 4:00 PM

Auxilliary Meeting
July 7, 1987
Security 8&L 5555 Ft. Wash.
7:00PM - 10:00PM

Annual Membership Dues
Individual - \$10
Family - \$15

BIG 2 day TI FAIR Week-end bonanza Extravaganza announced

Don't spend all your money at our swap meet next month, more good things are in store for us computer orphans. Plans are now complete and work is in full progress on our next big TI FAIR. The Wisconsin TI Computer Council and our Milwaukee Area User Group are again working hand in hand to make this year's Fair bigger and better than last year. We're getting started much earlier than last year's last minute preparations and so expect more vendors, more customers and more fun. We are getting great support and cooperation from the Chicago Group in making this a 2 day, 2 city TI WEEKEND. The Chicago portion will be Saturday November 7 followed by ours here in Milwaukee Sunday November 8 at the Quality Inn on south Howell Avenue right across from the airport. Lot's of volunteer help will be needed in setting up and running the FAIR so don't be bashfull, join in the fun!

Auxilliary Group Meeting June 7, Tuesday 7:00PM til 10:00PM

What was formerly our Special Interest Group Meeting on the first Tuesday every month, has lately gradually evolved into a sort of informal auxilliary group meeting. Usually no more than about a dozen members show up, discuss latest news and events, latest hardware and software offerings, debug programs, explain and help in software problems, trade public domain and freeware programs and generally shoot the breeze. Several of our members can't make the Saturday meetings and thus can make use of our group benefits this way. All members are welcome at the meeting and more should take advantage of this informal session. If you know of anyone interested in joining our User Group but can't make the Saturday morning meetings, let them know that all the group benefits are available at our Tuesday evening meetings also. Let one of the officers know and find out more about it.

BIG SWAP MEET JULY 11, 1987

Open to all Group members !!!!!
Now's your big chance to make some money selling off all your no-longer needed or extra computer or electronic related equipment for good hard cash. Our regular July meeting will be one big bargain fest, so come early, grab a table, get everything set up before the mob of bargain hunters comes swarming in.

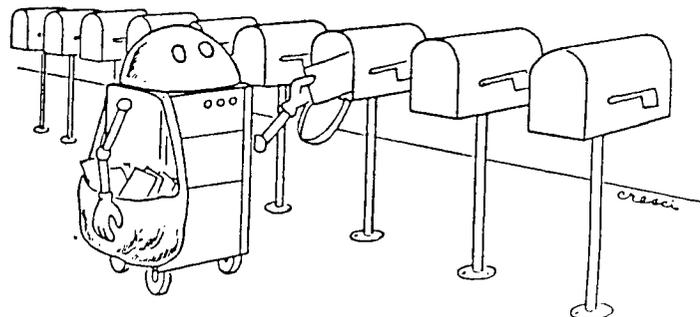
It will also be an ideal opportunity to pick up some good used equipment that you've been searching for, and even at rock bottom prices....but only if you get there early before all the goodies are picked out.

Our swap meet only comes around once a year so if you miss out on it, you'll just have to wait another year for such a chance to wheel and deal. This should bring all the hackers out of their summer doldrums!



I'LL BE DARNED. HIS PROGRAM DOES FLY.

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BOYCHASER by Tom Moore

I've put together a special program for Valentines Day. I call it BOYCHASER! You can call it anything you want. If you're a female perhaps you would like to call it GIRLCHASER. Since I wrote this thing, we'll go with BOYCHASER. Whichever way you go...it will work the same.

```
90 GOTO 100 :: CALL COLOR :: T,R,C,X,Y,
  D,Y#,M#,K,ST :: CALL SCREEN :: CALL
  SOUND :: CALL HCHAR :: CALL KEY ::
  CALL CLEAR :: CALL CHAR
92 !BP-
100 CALL CHAR(129,"1818FFBDBD2424E7",13
  6,"1818FFBDBD2424E7",126,"42E7FFFF
  F7E3C18") :: CALL COLOR(13,6,15,14,9
  ,15,12,7,15)
110 X,Y=1 :: R,C=5 :: CALL CLEAR :: CALL
  SCREEN(15)
120 FOR K=1 TO 5 :: FOR ST=1 TO 5 ::
  CALL HCHAR(5*K-4,5*ST+2,46) :: NEXT
  ST :: !BPT-
130 PRINT TAB(10);"DIRECTION NSEW:";
140 CALL HCHAR(5*R-4,5*C+2,129) :: CALL
  HCHAR(5*X-4,5*Y+2,136)
150 FOR T=1 TO 25 :: CALL SOUND(30,800,
  1) :: CALL SOUND(15,800,1)
160 CALL KEY(3,K,ST) :: IF ST=0 THEN 160
170 CALL HCHAR(24,18,K) :: CALL HCHAR(
  5*R-4,5*C+2,46) :: M#=CHR#(80)
180 IF M#="N" THEN R=R-1 ELSE IF M#="E"
  THEN C=C+1 ELSE IF M#="S" THEN R=R+1
  ELSE IF M#="W" THEN C=C-1
190 IF (R<>0)*(R<5)*(C<6) THEN 210
200 CALL CLEAR :: PRINT "YOU COMMITTED
  SUICIDE RATHER THAN BE CAUGHT. TSK
  TSK
  WANT TO TRY AGAIN" ::
  GOTO 320
210 CALL HCHAR(5*R-4,5*C+2,129) :: CALL
  HCHAR(5*X-4,5*Y+2,46)
220 IF (R=X)*(Y=C) THEN DISPLAY AT(24,1)
  : "SHE GOTCHA! PLAY AGAIN " ::
  CALL HCHAR(5*R-4,5*C+2,126) :: GOTO
  320
230 IF (X=R)*(Y<C) THEN D=1 ELSE IF (X>
  R)*(Y<C) THEN D=2 ELSE IF (X>R)*(Y=
  C) THEN D=3 ELSE IF (X>R)*(Y>C) THEN
  D=4
240 IF (X=R)*(Y>C) THEN D=5 ELSE IF (X<
  R)*(Y>C) THEN D=6 ELSE IF (X<R)*(Y=
  C) THEN D=7 ELSE IF (X<R)*(Y<C) THEN
  D=8
250 D=D+INT(3*RND-1) :: IF D=0 THEN D=8
  :: GOTO 260 ELSE IF D=9 THEN D=1
```

```
260 IF (D>1)*(D<5) THEN X=X-1 ELSE IF
  D>5 THEN X=X+1 ELSE IF (D>3)*(D<7)
  THEN Y=Y-1 ELSE IF (D<3)+((D=8)
  THEN Y=Y+1
270 IF X=0 THEN X=X+1 ELSE IF Y=0 THEN
  Y=Y+1 ELSE IF X=6 THEN X=X-1 ELSE
  IF Y=6 THEN Y=Y-1
280 IF (X<1)+(X>5)+(Y<1)+(Y>5) THEN CALL
  CLEAR :: PRINT "OUT OF BOUNDS!" ::
  GOTO 320
290 IF (X=R)*(Y=C) THEN DISPLAY AT(24,1)
  : "SHE GOTCHA " :: CALL HCHAR(5*R
  -4,5*C+2,126) :: GOTO 320
300 CALL HCHAR(5*X-4,5*Y+2,136) :: NEXT T
310 CALL CLEAR :: PRINT "YOU ESCAPED THE
  CLUTCHES OF MATRIMONY! CONGRATS!!"
320 INPUT Y#
330 IF Y#="Y" THEN 100 ELSE END
```

Here's the way you play. After loading and running the program you will see a 5x5 grid on your screen. In the lower right hand corner is the boy (that's you) and in the upper left hand corner is the girl (that's the enemy).

You can move North, South, East or West or just stand still if you wish. Press the "N" key for North, the "S" key for South etc. After you move the girl will begin to chase you. The object of this little ditty is to keep out of the matrimonial clutches of this girl. She has 25 moves in which to trap and catch you. If she does, a bright red heart appears at the place of capture and you marry her. If you avoid her for 25 moves you will see a warm congratulatory message on your screen with the option to play this risky game again.

Pressing any other key will keep you in the same location... but the girl gets to move closer to you. This's dangerous unless of course you want to be caught. Another option, should you feel trapped and about to be caught, is to jump off the grid. Of course you will be killed, but then some consider marriage a fate worse than death. That choice is yours!

And please! No letters from NOW or any others accusing me of being sexist. I did say you could call this thing GIRL-CHASER. This is an equal opportunity marriage program !

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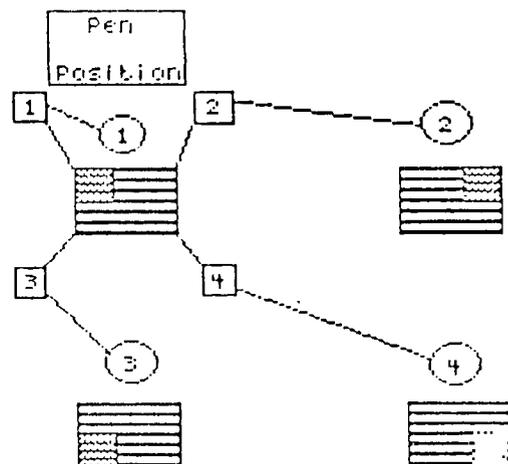
TED, GENE, JIM & RON

ACHT *

ALLES TOURISTEN UND NOT-TECHNISCHEN LOOKEN PEEPERS! DAS MACHINE CONTROL IS NICHT FUR GERFINGERPOKEN UND MITTENGGRABEN. ODERWISE IS EASY SCHNAPPEN DER SPRINGENWERK, BLOWNFUSE UND POPPENCORKEN MIT SPITZENSPAKEN. DER MACHINE IS DIGGIN BY EXPERTEN ONLY. IS NICHT FUR GERVERKEN BY DAS DUNKOPFEN. DAS RUBBERNECKEN SIGHTSEENEN KEEPEN DAS COTTEN PICKEN HANDS IN DAS POCKETS. SO RELAXEN UND WATCHEN DAS BLINKENLIGHTS.

Flip and Mirror With TI-ARTIST
 By Beverly Cook

Here's a little tip on a very obscure feature of TI-ARTIST. This feature is mentioned briefly and without much explanation. To flip or mirror a picture or instance, select either the MOVE WITHOUT COLOR or COPY WITHOUT COLOR feature from the enhancement. Position the pen at one of the corners (as shown below) and completely surround the picture with a box. Press the fire button and the picture will be picked up. If you're happy with the position of it, press the fire button again and the picture will be dropped, but it will be in the direction you wanted the change made. It's a bit confusing, but try it a time or two and you'll see how it works.



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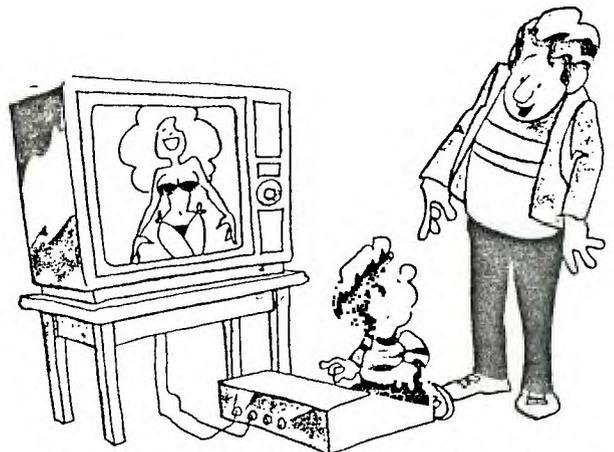
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THE BROKEN KEY

I have had my computer almost four years now, and it works very well except for one key. I suspect I shouldn't complain; there are 47 other keys I can use. Besides, what difference can one key make?

After giving it some thought, I realized that the keyboard on my TI is similar to our club. There are numerous members in the club; some are more 'visible' than others. Some members participate; some won't participate (or can't). I understand those individuals, who due to other commitments, can't participate. I also understand those individuals who do not participate because they feel they can't make a difference. Let me assure you, your participation does make a difference! Perhaps you could review a piece of hardware or software at a meeting. We can always use an article - if it's important to you, it's important to others! How about donating a module or book to the club so everyone can use it? The possibilities are not endless, but they certainly are many and diverse.

If there is a moral to this story, let it be that all members are 'KEY' members.

The first step to creating a worksheet is to decide how many rows and columns you'll need, and how the data will be displayed. It is best to sketch this out on paper to get a feel for how it will look. Also, you'll need to decide what formulas will have to be created that use the data contained in the worksheet. Lastly, you will probably want to change the format of many of the cells, usually by rows or columns. Most often, the formatting required is for display purposes. Cell width, alignment of the data within the cells, etc.

Now that you know how everything will look, begin by formatting the cells. Upon start-up, the cells are set with a number of defaults. You may want to change the widths of some columns, to between 3 and 32 columns, to show all of the entry for the cells. If the data in a cell is too large to fit the width of the cell, it will be truncated to fit, unless it is a numerical entry, where it will be replaced by a string of "#"'s.

FORMAT CELLS is used to set cell alignment and display format. A cell can be aligned to either center text for columnar headers, etc., or to align data displayed in tables. For instance, a table of dollar values could be shown with a "\$" in front and decimal points aligned.

The display formats are used to show how the data appears in a cell. CONTINUOUS allows the text in a cell to run over the right boundary to the next cell. If all cells are made continuous, you have a word processor-type format. EXP displays numbers in scientific notation. Fixed Point rounds off decimals to a defined number. GENERAL is as you see when starting up, values displayed as entered. INTEGER rounds off all numbers to integers. "\$" (Dollar) adds a dollar sign to numbers and rounds to two decimals. "*" Replaces the number with an equivalent number of asterisks, to use like a bar graph. "%" displays the number in percent form. Lastly, the "-" just leaves the setting at the previous option.

Now that the cell formats are defined, it's time to start entering data. Begin by labeling your rows and columns, as necessary. To enter data, either text or values, move the cursor to the desired cell and hit either "A" or "V", depending on the type. The command line will disappear and you'll be prompted for either text or value. Type in your entry and hit enter either <ENTER> to return to the command line, or use the appropriate FCTN-ARROW key to move to the next cell. With the FCTN key, when you land on the next cell, you are prompted only for text/value entry. In this case, you do not hit A or V to declare type, but when you begin entering data, Multiplan decides what style the data is, and responds accordingly. The only disadvantage is that there's a slight delay between the first character of your entry and the remainder, so if you type in, for instance, the word "TOTALS" too quickly, all you'll see in the cell is "TTOLS". After a bit of use, a "stutter" habit is developed in how you enter data, so this becomes less apparent. When entering data, if an error is made, do not use the FCTN-S key to backspace for correction (as programmers are used to), the backspace key is CTRL-H (as telecommunication folks are used to).

If, after creating part of a worksheet, you need to add or delete rows or columns, three commands apply. DELETE completely removes any number of rows or columns. BLANK just removes the data in the cells, the row/columns remain and retain their formats. INSERT creates a new row or column set to the default settings.

Formulas are used to perform a mathematical computation upon the data in a cell or group of cells. One example is in a sales order form, where you have a column of data that is totaled at the bottom, multiplied by a tax percentage, and the tax added to the result. The cell in which the sub-total is to appear would contain a formula describing a sum of the data in the columns, expressed as either a chain addition problem, (R3C5+R4C5+...+R10C5) or using the SUM() function and a range of cells. (SUM(R3C5:R10C5)). The formulas can become quite complex, depending on the work performed. Appendix C contains a list of the mathematical functions that can be used in building formulas.

Formulas can also consist of names of cells as the operand, as in "SUBTOTAL x .079", to calculate the entry for a cell named TAX. Names are assigned with the name command. Names can be any continuous string of alpha-numeric characters, but must begin with a letter. Simply place the cursor over the cell to name and press N. Type in the desired name to the response field, and TAB to the next field. The current cell will be shown as the proposed response. If a range of cells is desired, hit the FCTN key, at the cell response, to move the cursor from the current location to the end point, then hit <ENTER>. In this manner, a whole row or column can be named. Names can also be used in the GOTO command to aid in moving quickly to a location. "GOTO TOTALS" for example.

Windows allow you to view more than one area of your worksheet at one time. You can split a row or column of titles to form a window over the data, so as the cursor is moved throughout the worksheet, the headers remain in place to see what data is shown. Also, separate worksheets can be developed in one and divided into windows so all can be seen at once. After selecting the window command, four options are shown. SPLIT is what opens the windows, either horizontally, vertically, or at preset titles. LINKing two or more windows scrolls them together as you move through the worksheet. BORDER is used to put a border of any character surrounding the windows, to make them easier to read. A window is cancelled with the CLOSE option.

Once you have finally created the worksheet, and all the data has been entered, what do you do with it? In a sense, the end product is the worksheet, because you may refer to it constantly as new data is applied, and a printed copy might become outdated quickly. After all, that's part of the reason you are working on an Electronic Spreadsheet in the first place, the instant and easy update of information.

In some cases though, a printout is desired, either in the form of a disk file that can be incorporated into a document on a word processor, or a hard-copy printout for reference. The printer command has four options used in printing the worksheet. FILE prints the worksheet to disk in display variable 80 format, which can be loaded into a word processor. Before printing a hard copy, you must first set margins and print options. The MARGINS option sets the limits of rows and columns in the printout, along with indentations and paginations. OPTIONS defines the portion of the worksheet to be printed, using a range of cells. The set-up field contains the device name of your printer. The last two fields let you print the formulas "hidden" in cells, and whether or not to print the row/column numbers. After margins and options are defined, select the PRINTER option to begin the print-out. If the width of the worksheet exceeds the width of your printer carriage, the left half will be printed entirely, then the right half below that, so the two can be cut-&-pasted together.

In some cases, you may be working on a number of worksheets that are related to each other, such as in a business with SALES/PAYROLL/INVENTORY spreadsheets. These separate files can be linked together so data can be drawn from, as an example, the INVENTORY file to be used in the SALES worksheet and information from SALES could be used in PAYROLL.

The EXTERNAL command, (press "X" at command line) is used to COPY data from an inactive sheet into the active one. You are prompted for the filename of the source sheet, the name (or R/C reference) of the source cell, the destination cell of the data, and the LINK option. If LINK is selected, then the two sheets will become linked so that when the destination sheet is loaded, the source sheet will automatically be used to supply data where needed. The LIST option displays the names of all sheets supporting the active sheet. The USE option allows you to switch which inactive sheets will support the active sheet, so long as they are in the same format. As an example, the SALES sheet would call upon different INVENTORY sheets for each month, all created in the same format, with different data.

MULTIPLAN Part Two
 an Electronic Spreadsheet
 by Tom Kennedy

Multiplan is one of the most powerful tools to be used on any computer. It's versatility allows it to be used in many different applications. Word Processing, record keeping, budget/accounting, etc. Any application that requires storing data in a tabular format. The instant update of information and the advanced mathematics capability can be used in a variety of ways.

Versatility is the main attraction of the many spreadsheet programs used on various machines, and in fact, Multiplan can even use files stored in VISICALC(tm) format. VISICALC, one of the "first" major spreadsheets, is similar to Multiplan in many ways: the screen display; cursor positioning; error correction; and entering data and formulas. The referencing of cells is more detailed with Multiplan, including the ability to name cells for ease of use. It has been shown that Multiplan can be easier to pick up and use for the person not familiar to spreadsheets, although once the concepts are mastered, the usage is similar in all. With a familiar knowledge of a program like Multiplan, you could do away with a word processor, a database manager, or even a pocket calculator, although each has it's specific advantages.

I have tried to cover the basics of getting started in working with spreadsheets, but I have still only scratched the surface of the wealth of information within the manual supplied with Multiplan. A walk-thru in the first half provides a very good introduction, and the second half documents each command and function in detail. There also a number of good books available on Multiplan, and the software is the same on nearly every machine.

 APPENDIX A COMMANDS

ALPHA	NAME
BLANK	OPTIONS
COPY	PRINT
COPY DOWN	PRINT FILE
COPY FROM	PRINT MARGINS
COPY RIGHT	PRINT OPTIONS
DELETE	PRINT PRINTER
DELETE COLUMN	QUIT
DELETE ROW	SORT
EDIT	TRANSFER
FORMAT	TRANSFER CLEAR
FORMAT CELLS	TRANSFER DELETE
FORMAT DEFAULT	TRANSFER LOAD
FORMAT DEFAULT CELLS	TRANSFER OPTIONS
FORMAT DEFAULT WIDTH	TRANSFER RENAME
FORMAT OPTIONS	TRANSFER SAVE
FORMAT WIDTH	VALUE
GOTO	WINDOW
GOTO NAME	WINDOW BORDER
GOTO ROW-COL	WINDOW CLOSE
GOTO WINDOW	WINDOW LINK
HELP	WINDOW SPLIT
INSERT	WINDOW SPLIT HORIZONTAL
INSERT COLUMN	WINDOW SPLIT TITLES
INSERT ROW	
	WINDOW SPLIT VERTICAL
LOCK	eXTERNAL
LOCK CELLS	eXTERNAL COPY
LOCK FORMULAS	eXTERNAL LIST
MOVE	eXTERNAL USE
MOVE COLUMN	
MOVE ROW	

 APPENDIX B KEY FUNCTIONS

FCTN-E	CURSOR
FCTN-X	SCROLL
FCTN-S	
FCTN-D	
CTRL-E	
CTRL-X	PAGE
CTRL-S	SCROLL
CTRL-D	
CTRL-W (CTRL-6)	NEXT WINDOW
CTRL-3 (CTRL-F)	NEXT UNLOCKED CELL
CTRL-1 (CTRL-Q)	HOME
CTRL-Z (FCTN-1)	LOWER RIGHT
<SPACE>	MENU RESPONSE TAB
FCTN-9 (CTRL-H)	BACKSPACE
CTRL-A (CTRL-2, TAB)	
CTRL-1)	
CTRL-C (CTRL-=-)	CANCEL
FCTN-4	PRINT CANCEL
<ENTER>	ENTER RESPONSE
FCTN-1 (FCTN-7)	HELP
FCTN-8	RECALC
-, +, 0-9	VALUE RESPONSE
FCTN-9 (CTRL-H)	BACKSPACE
FCTN-0 (CTRL-Y)	CHARACTER DELETE
CTRL-4 (CTRL-L)	CHARACTER FORWARD
FCTN-4 (CTRL-K)	CHARACTER BACK
CTRL-5 (CTRL-P)	WORD FORWARD
FCTN-5 (CTRL-O)	WORD BACK
CTRL-7	REFERENCE

 APPENDIX C MATHEMATICAL FUNCTIONS

ABS	MAX
AND	MIO
ATAN	MIN
AVERAGE	MUD
COLUMN	NA
COS	NOT
COUNT	NPV
DOLLAR	OR
EXP	PI
FALSE	REPT
FIXED	ROUND
IF	ROW
INDEX	SIGN
INT	SIN
ISERROR	SQRT
ISNA	STDEV
LEN	SUM
LN	TAN
LOG10	TRUE
LOOKUP	VALUE

SFV Times

 * EASY WRITER *
 * by Carlson *

In our last episode we explored the inner depths of the disk directory pausing only to read a file now and then. Leaving behind the crowded suburbs of the disk directory we come upon the wide open spaces of the data desert. Whole files have been known to get lost in this region. The object of this game is to take over territory on the disk by writing files to it. Files can be mapped out just like arrays in BASIC. When you OPEN a file, you allocate space for it in the data desert, just as DIM does for arrays. Since we want the ability to write where ever we want, we use a RELATIVE file. This means that the file can be accessed by record number, just like a string array of one dimension. The program we will explore, reads and writes DIS/FIX files ?? that are compatible with EDIT1 from E/A.

In 10 we prompt for the FILENAME, notice the lack of space between file and name. This is a defined word in 11, indicating both the device name and the file name(DSKX,FILE_NAME). 20 opens our file in UPDATE(read and write) with FILE# record length of 80. Changing this number before you run the program allows you to use records of length up to 255, as long as it's FIXED. If you substitute INTERNAL for DISPLAY, you get more storage space and faster accesses. 30 and 40 ask if this is a new file. To keep track of how big the file is, we place the number of records in the 0th record. If we are opening a file for the first time, there is no record 0 yet. If we answer 30 with Y or y line 50 writes a "0" to record 0, establishing a record 0 and indicating there are no records following. That messy sort of business behind us we arrive at the main menu. 60 to 90 sends you out to one of the three routines, and returns to do it again. Since the file stays open during the whole program, you have to QUIT (FCTN-4) to use a different file.

The read routine from 120 to 170, reads the file sequentially using a FOR NEXT loop. The loop counter is initialized to the value of A1\$, which was read from record 0. The file is read, record by record with line 140, and written to the screen with 150. Notice the lack of an EOF statement. The routine returns to the program with X equal to the next record to be written. Most of the PRINT# and INPUT# statements refer to X for the record number. Since this is a subroutine, it can be called from anywhere in the program.

The write routine runs from 180 to 360. The first thing it does is use the read routine to display the file. As 190 indicates we then drop into the routine for adding lines to our file. Since we can't use a variable in the prompt of the input statement in 210, we use 200 to provide us with an indicator of which record we are writing. Assuming we entered a line that didn't start with "."(period) the program jumps down to 310 where it writes the line to the file as record number X. (remember that X has been set to one past the records just read by the read subroutine) 320 then increments our record counter, and 310 sends it back to our input section. Since this forms an endless loop, we have to devise some means of getting out of it. To accomplish this I added line 220. I chose the dot convention to execute commands while we were in our entry mode. A simple way to check the first character of a string, without bothering with the actual length of the string is to use the ASC function. Since it only returns one character it ignores the rest of the string.

We have 2 commands available in this routine. .Q quits adding lines, but returns to the options menu. .E allows you change lines by selecting the record number you wish to write. In the case of .Q line 370 updates the record length by writing the value of X-1 to record 0, followed by a return to our entry mode. .E on the other hand has a little confusion, because it uses a nested subroutine call within a subroutine. 240 insures that only a .E is permitted to continue, anything else returns to our input prompt. Since we will be using X in the EDIT version of the subroutine, we save X(the EOF pointer) in Y. Next we prompt for a new value of X and display that we are now in the edit mode. Now we GOSUB our file adding routine from line 280. Notice that when we return from this nesting of the subroutine we return to 270, where we restore our EOF value to X and goto 190 to restore our add mode indicator. Since we are using the same routine to edit as we are to add, the edit routine continues to add lines starting from the one specified until you start a line with .Q. When you enter .Q the subroutine returns by dropping back into the ADD routine.

Since we wanted the ability to write at random, we could not use a VARIABLE file. This means our output can not be used by TI-WRITER. You can convert to any file type you wish by using the file read routine (120-170), and adding OPEN #2 and PRINT #2 statements in the in the format you want to convert into. Other dot commands can be defined, tested for, and jumped to by GOSUB, once the new routine is written. Dont forget to save any variables that you don't want modified. This simple editor can write a file big enuff to fill the disk. There is plenty of memory left for experimentation because the program saves all the data on the disk, so the EASY WRITER rolls along.

```

10 INPUT "FILENAME?":A$
20 OPEN #1:A$,UPDATE,DISPLAY
  ,RELATIVE,FIXED 80
30 INPUT "IS THIS A NEW FILE
?(Y/N)":A$
40 IF (A$="N")+(A$="n")THEN
60
50 PRINT #1,REC 0:"0"
60 PRINT "1.READ":"2.WRITE":
  "3.QUIT":
70 INPUT A
80 ON A GOSUB 120,130,100
90 GOTO 60
100 CLOSE #1
110 STOP
120 INPUT #1,REC 0:A1$
130 FOR X=1 TO VAL(A1$)
140 INPUT #1,REC X:A$
150 PRINT X:A$
160 NEXT X
170 RETURN
180 PRINT "EASY WRITER"
190 GOSUB 200
200 X=Y
210 PRINT Y:
220 INPUT "":A$
230 IF ASC(A$) > 46 THEN 310
240 IF A$="." THEN 250
250 IF A$="." THEN 250
260 X=Y
270 INPUT "LINE TO EDIT":X
280 PRINT "EASY WRITER"
290 GOSUB 200
300 GOTO 190
310 PRINT "EASY WRITER"
320 X=X+1
330 PRINT X:
340 GOTO 210
350 PRINT #1,REC X:PRINT#X:A$
360 RETURN

```

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